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The continued support of the management and Principal has encouraged the successful publication of Marian Quest. We wholeheartedly thank the reviewing panel for their valued expertise. We acknowledge the contributions made by the research forum for their meticulous effort to make this issue of Marian Quest.

Best wishes,

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Main Heading : Each article should be divided into the following main headings: Abstract, Introduction, Materials and Methods, Results and Discussion, Conclusion, Acknowledgement and References.

All articles are, as a rule, referred to experts in the subject concerned. Those recommended by the referees alone will be published in the journal.



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**JOURNEY TOWARDS ENLIGHTENMENT: A STUDY OF RALPH
ELLISON’S INVISIBLE MAN**

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Abstract

Ralph Ellison (1914-1994) is an African-American novelist, and literary critic. His fiction asserts the need for white Americans to recognize the Negro identity in all its complexity. His most famous novel, *Invisible Man*, is published just before the crest of America’s revolutionary wave of Civil Rights for minorities. It is hailed not only as the first significant novel by a black author to receive the prestigious National Book Award for Fiction in 1953, but to change the shape of American literature. The study traces the physical and psychological transformation of its hero, an unnamed narrator; a young Southern Negro, a college-educated, who is relentlessly struggling to survive and delineate himself in a racially-divided society that refuses to see him as a human being.

Keywords: racism, Blackness, Whiteness, segregation, quest, identity, flashbacks, memories.

Introduction

Ralph Ellison is one of the famous American writers who has dominated the landscape of the contemporary American fiction, after World War II, with his extraordinary imagination, powerful expression and at spoken candour-. He is a novelist with a commitment and a quest. Despite the fact that Ellison never published another novel, *Invisible Man*, which is concerned with the identity and humanity of a black individual, appeared in 1952, has immortalized him, and remained central to the American imagination over half a century. In 1953 Ellison won the National Book Award for his work, and polled as the most distinguished book in a Book Week-poll. Two hundred American critics and writers judged *Invisible Man* as one of the best American novels of the post war. His career as a creative writer is a voyage towards meaning and a pilgrimage towards truth. To “find himself”, Ellison believes that a novelist should first of all, know the fundamentals of the art of fiction.

He believes that art is an expression of transcendent values. His concern and quest have been to confront the hidden realities in the Negro life and to explore his psyche in order to depict him with his values and humanity.

As a black writer Ellison has obviously been struggling to penetrate into the ambiguous, enigmatic and ironic forms and meanings, defining thereby the complex fate and personality of the American Negro. The problem of identity and existence has, however, remained at the centre of every movement and at the core of every ideological stance of the Negro people. It has passed through different stages and phases of their history, assuming different colours and shades of meaning.

Ellison's *Invisible Man* is a representation of black identity politics. Racism, ideologically spelt as identity politics, is an outshoot of cultural politics, where the individual identifies with the native culture. Ellison feels that unless human beings recognize the mutual identity shared by independent individuals, no one can universalize these desires for identity into a true human vocation. The novel's central motif indicates, the protagonist's painful but enlightening journey from the state of visibility to invisibility is a dominant metaphor in the life of the African-American. Invisibility also suggests the plight and trauma which a man suffers when his fundamental rights are violated and his psyche is subdued by the dominant cultural group. He is forced to live in a hostile environment that makes him sterile and timid.

The narrator's metaphor of invisibility is connected to race. Though he has not accurately stated it, the narrative confirms that the narrator is black. The narrator indicates that his blackness is the cause why the white man doesn't accept the narrator as anything more than a bad dream. By trying to take as much power as possible, the narrator shows to himself that he has an identity beyond what the white power structure directs for him. He loves to hear five recordings of Louis Armstrong playing and singing.

The narrator, in his vision sees the layers of black history that are converted into a dream like sermon. The sermon tells him that "black," skin colour, and "bloody" violence, have gone together ever since black men and women were brought to America. The invisible man sees a beautiful girl, of the colour of ivory, pleading in a voice like his mother's as she stood before a group of slave owners who bid for her naked body. She is emblematic of the

perplexing legacy of America. Her master is her oppressor, yet she is connected to him in ways that cannot be easily dissolved or repaired. She is compelled to kill her master to free her children, but at great pain to herself. The invisible man bumped into a white man who called his names, which infuriated the dark invisible man so much that he butted him, tore his flesh and the white man yelled for apologize. But the white man continued to curse him.

The narrator is alarmed, disturbed and confused by the old man's words. He has been praised by the powerful white men for his meekness, especially for his speech on his graduation day, in which he focused on humility; he expressed that humility was the secret of progress. He is perplexed as to how he should behave with the whites. The narrator says:

It became a constant puzzle which lay unanswered in the back of my mind. And whenever things went well for me I remembered my grandfather and felt guilty and uncomfortable... And to make it worse, everyone loved me for it. I was praised by the most lily-white men of the town. I was considered an example of desirable conduct just as my my grandfather had been. (16)

The Battle Royal incident declares the way in which members of the black community are recognized by whites. They are a source of cruel amusement. At a gathering of white community leaders, black high school students are blindfolded and told to fight one another. For the further amusement of white audience, they are ordered to grab for what turn out to be counterfeit coins placed on an electrified rug. The rug was covered with coins of all dimensions and a few crumpled bills interspersed with gold pieces. As he tried to get a coin lying on the blue design of the carpet, a violent force tore through his body, shook him like a wet rat. The white leaders enjoy themselves watching a spectacle of torture.

The invisible man had his mouth filled with the warm blood. He couldn't tell if the moisture on his body was due to sweat or blood. He lay prone pretending that he was knocked out, but somebody put him on his feet and commanded as get away black boy. The fight and its setting embody racism because it pits black children against each other for the entertainment of the racist audience. He is perplexed as to how he should behave with the whites.

The narrator mirrors on an earlier period of the 20th century, indicating that a newly educated black class felt ashamed of a past that was no fault of its own. Narrator's grandfather on his death bed, he called his son and said to him, "Son, after I'm gone I want you to keep the good fight. I never told you, but our life is a war and I have been a traitor all my born days" (16). The invisible man was trying to carry out his grandfather's advice in spite of himself and was loved by the people for it. He carried his grandfather's mission under the mask of quietness and meekness. He hadn't had the courage to carry his grandfather's advice in open defiance because he feared the whites wouldn't like that.

Dr. A. Hebert Bledsoe perpetuates the myth of white supremacy rather than updating his students and giving them with an education that prepares them to give to society and service as educated adults in the real world. He had an awful figure and students called him "old Buckethead." Bledsoe charged invisible man with the offence of taking Mr. Norton to the slums. He asked, "Did you think that white man had to come a thousand miles all the way from New York and Boston and Philadelphia just for you to show him a slum" (135).

Dr. Bledsoe told invisible man he should not have taken Mr. Norton to the God-forbidden place, even if he wanted to go there. The narrator momentarily sees the school turn into a world of overwhelming whiteness. Bledsoe is amazed that the narrator hasn't learned how to lie to white folks while seeming to follow their orders. Bledsoe said that the whites have no aversion for lies. Their magazines, newspapers, and radios, and spokesmen often told lies. He is finally exposing the truth behind the façade of black obedience-a truth that the naïve narrator hasn't learned yet;

He ordered you. Dammit, white folk are always giving orders, it's a habit with them. Why didn't you make an excuse? Couldn't you say they had sickness smallpox-or picked another cabin? Why that Trueblood shack? My God, boy! You're black and living in the south-did you forget how to lie? (135)

The naked white woman is a representation of sexual power, something that the black boys have been taught is completely taboo for them. Accordingly, the town leaders, indulging in their own debauchery, use it to

torture the black boys. In private, the town leaders lose all sense of public decency, working themselves into a frenzy to chase the naked women. The invisible man saw a magnificent blonde and strongly attracted,

The hair was yellow like that of a circus kewpie doll, the face heavily powdered and roughed, as though to form an abstract mask, the eyes hollow and smeared a cool blue, the color of a baboon's butt. I felt a desire to spit upon her as my eyes brushed slowly over her body. (19)

The black people are acquired up in the merciless circle. Their poverty and insufficiency of skill in the profession stop them for their progress and force them to give way in criminal activities and lose their solemnity and self-respect. Jim Trueblood commits incest with his own daughter. As to the cause or the environment of the incest Trueblood argues:

You see, Suh, it was cold and us did not have much fire. Nothin' but wood, no coal. I tried to git help but wouldn't nobody help us and I couldn't find no work or nothing'. It was so cold all of us had to sleep together; me, the ole lady and the gal. That's how it started, Suh.'(53)

The complex nature of Trueblood's story telling highlights that he is more than simply an unknowledgeable criminal. His ability of speech constitutes traditions and talents that are native to black culture and cannot be easily removed away. His dream emphasis on the impression of a white woman. Similar to the white woman before the battle royal, the woman in Trueblood's dream represents something Taboo for a black man. The dream places Trueblood's crime in dialogue with the history of white oppression. Trueblood's horrible crime is reflective of both his hopelessness and the power of a taboo wish that lies deep below the social norms of the community.

The presence of racial experienced Black people cause stress, ugly, and dead. Black was felt very angry for white people. It had occurred protest and awaken again felt nationalist Black to their race. They felt proud to their identity as African-American. It cause emerged organization nationalist Black. That is Ras the Exhorter. Ras the Exhorter represents the Black Nationalist movement, which advocates the violent overthrow of white supremacy. The author, Ralph Ellison seems to use him to comment on the Black Nationalist leader Marcus Garvey, who believed that blacks would never achieve freedom in white society. A maverick, Ras frequently opposes the Brotherhood and

often violently, and incites riots in Harlem. As a passionate black nationalist, Ras was obsessed with the idea of race, as a magnificently charismatic leader, he has a kind of godlike power.

Ras the Exhorter was a great leader with great power of eloquence. He had formed a group of the blacks which was ready to go into action at his command. It was partly due to his fiery speeches. The protagonist even when he did not know Ras the Exhorter had the chance to hear his speech which impressed him though the protagonist himself was a speaker par excellence. Brother Jack also admitted that Ras the Exhorter has had a monopoly in Harlem. He was a daring agitator, and know well how to mobilize and unite black people against the whites. He was completely free from fear and cowardice. The leadership qualities were ingrained in him. Ras the Exhorter hates the fact that Clifton and the narrator are calling white men their brothers. He believes that black people should not even associate with white people especially when it comes to social change;

We sons of Mama Africa, you done forget? You black, BLACK! You – Godahm, mahn!’ he said, swinging the knife for emphasis. ‘You got bahd hair! You got thick lips! They say you stink! They hate you, mahn. You African. AFRICAN! Why you with them? Leave that shit, mahn. They sell you out. That shit is old fashioned. They enslave us – you forget that? How can they mean a black mahn any good? How they going to be your brother? (357)

Ras the Exhorter led his men in a riot because it was heard that a police had shot down a black woman and a drunken white woman had tried to use a black man to satisfy her lust. Ras the Exhorter became Ras the Destroyer. He incited the black community not only against atrocities of the police but also against the Brotherhood which as he believed was creating a division in the community of blacks. Stores and shops of the whites were looted and plundered. A large building which belonged to whites was set on fire and all the blacks living in it evacuated it voluntarily, so that it could be burnt to a cinder. It was strange scene people watched their homes burning.

Race is not a thing, not a hypostatized object, but is rather a matter of a personal movements, relations, impingements of body-on-body, sensation-on-idea. The narrator moves through crowds, he takes the texture of the world around him. The invisibility that has kept him under lock and key for so long

has become the very affect that has allowed him to see, not only himself, not only his place, but all of the fissures and cracks that run through the world.

The Negro's loneliness was simply awful; it was a two-dimensional thing: it had the breadth of unfamiliarity and also the painful depth of isolation. Their migration was a leap into the unknown which caused almost a total loss of the identity where they were caught in a dark seamless web of alienation and invisibility. Like any other modern hero, the protagonist of this novel is a victim of his age with an awareness of his tragic situation and spiritual potential. The root cause of his trouble is the loss of the sense of belonging which is most essential for achieving personal identity. It seems clear that the hero tries hard to push his roots into the American soil, but the others refused to accept him. Like any other Negro, he found himself in a sprawling wilderness.

Reflecting the influence of the music of the black folklore, he tried to find the definition of himself and of his invisibility in Louis Armstrong song. With the music, the hero descends, like Dante, into the depths of his being and sends back his notes from the underground world. He dives into his past to recollect his memories and experiences. The protagonist, however, becomes withdrawn and extremely reflective to achieve visibility. He realizes that man's life is a continuous conflict between tragedy and hope. He wants to be a man of action as soon as he comes out of the underground cell, as he has made an announcement to that effect in the Epilogue. He decides to come out, to emerge where the novel ends with the note that the protagonist's resolution is to act and in so doing to achieve a new identity.

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TOWARDS AN ECRITURE FEMININE: A STUDY OF THE UTOPIAN NOVEL MARGE PIERCY'S WOMAN ON THE EDGE OF TIME

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Abstract:

The purpose of this qualitative study was to give a feminine language analysis of Marge Piercy's *Women on the Edge of Time* feminine language reading. Reading piercy's *Women on the Edge of Time* under her use of words to destabilise social structure through linguistic disruption. Given Piercy's thematic content of love, dreams, fate, unity, and it intensely focuses on the exploit language in the novel to preserve women in their inferior position in patriarchal society. *Women on the Edge of Time* attempt to introduce Mattapoissett as a utopian society based on equality, cooperation, and justice without any gender differences or racism. Elements of *écriture féminine* were detected and highlighted in Luciente, an androgynous young woman from the future. Consolidates the woman like Connie grow up through the concrete, to consider a better way of life, a society with shorter work hours, her ability choose to work on meaningful activities, and lifelong learning. The findings of this study are significant because they can shed additional light on the study of feminine language.

Key Words: Feminine Language, Female Utopianism, Motherhood, Sexuality, LGBT.

Introduction

Marge Piercy was born in 1936, March 31 at Detroit, Michigan. She was an American liberal activist and writer. Her work includes *Woman on the Edge of Time*, *He, She and It*, which won the 1993 Arthur C. Clarke Award and *Gone to Soldiers*, a New York Times Best Seller and an extensive historical novel is set in World War II. Piercy's work is embedded in her Jewish heritage, communist social and political activism, and feminist ideals. She stood complicated in the civil rights movement, New Left, and Students for a Democratic Society. She is a feminist, environmentalist, Marxist, social, and anti-war activist. In 1977, Piercy became a comrade of the Women's Institute for Freedom of the Press (WIFFP) an American non-profit publishing organization that works to increase communication between

women and women-based media. Piercy's novels and poetry habitually focus on feminist or social concerns, even though her settings vary.

Woman on the Edge of Time (1976) assembles a time travel story with subjects of social justice, feminism, and the treatment of the mental illness. It is considered a classic of utopian "speculative" science fiction as well as a feminist classic. The novel merges feminist standards with Utopian visions of a future society based on principles of community and equality. Piercy imagined a post-apocalyptic world that established *Woman on the Edge of Time* as an early feminist innovation in the conventionally male genre of dystopian fiction. Depictions of sexuality and relations between the genders were recognized as useful elements in portraying the conflict between individual and societal demands. For example, the governments of dystopian societies like those described in *We*, *Brave New World*, and *1984*, all focus on sexuality as a crux of trouble for their efforts at public control. This focus comes out largely because of awareness on the part of these governments that sexuality is a probable locus of powerful rebellious energies. *Woman on the Edge of Time* finely counterpoints the Utopianism of Mattapoiset with the dystopian practically with which Connie's actual world is represented.

"Who knows what women can be when they are finally free to become themselves? Who knows what women's intelligence will contribute when it can be nourished without denying love?" (n.p) says Betty Friedan. The term "female utopianism" has a wide range of meanings and is hotly debated. It should come as no surprise that, because there is no such thing as feminism in isolation, there is no one definition of feminist utopianism.

Marge Piercy's work in future feminist fiction has remained prolific. This thought was vital for the topic at hand, particularly the female voice in feminist critical dystopian fiction. Because male authors have dominated the dystopian genre for the past century, women writers who aspire to produce works in the genre are not in a particularly advantageous position to begin with. As a result, female dystopian authors are concerned not only with criticising more general issues of their time, such as the increasing importance of technology and the strain of civilisation on individual liberty, but also with confronting the problematic position of women in a patriarchal society on both a literary and societal level. They are forced to express themselves in the mainstream language in order to operate in a culture and genre characterised by masculine prejudice, while yet attempting to

convey their personal, often subversive point of view. Much has been written on the challenges faced by female writers, and some feminist literary critics and philosophers have offered some insightful insights on the matter.

The oppressed sex is represented by the female protagonists in Marge Piercy's *Woman on the Edge of Time*. In fact, it appears that none of the women's images in the story are empowering in any sense. Connie and Offered are oppressed and controlled in a situation from which they desperately want to flee. The only good portrayal of a woman in the book is Luciente, the time traveller in *Woman on the Edge of Time*, but I don't want to include her because she is technically part of a utopian rather than a dystopian story. Although it is easy to argue that the female characters in these novels are still worse off than the male characters since dystopias are often dreary and gloomy, it is difficult to overlook that the female characters in these novels are still worse off than the male ones.

Supporters of patriarchal power structures appear to exploit language in the novel to preserve women in their inferior position. The only language that the oppressed are allowed to speak, as in Zamyatin's *We* and Orwell's *Nineteen Eighty-Four*, is one that has been fashioned by the oppressors. Piercy transports Connie to a future in which language is used to demonstrate that full gender equality has been attained and will continue to be reached. These examples, in my opinion, reaffirm the idea that language may be used as a tool of oppression as well as freedom. The author of the novel appears to have confronted Connie by giving these characters a voice.

Piercy chose a Chicana lady who experiences the consequences of all class, gender, and race in order to show and critique principles of American twentieth-century society. Makinen says, "Connie's discrimination takes place on three levels: that of gender, class and race, all of which constitute the grounds for her social oppression" (17) and Bammer states readers should not forget "the determinants of power" in a patriarchal society (96). Additionally, Frances Bartkowski points out, "Piercy chose Connie to narrate her own story because her life is one in which many of the social practices criticized by contemporary feminism are brought to light" (53).

Consuelo (Connie) Ramos is an impoverished Mexican American woman who lives in New York. More than that, Piercy drives her heroine insane in order to show how the issues at hand, such as class, gender, and race, affect and even dictate

treatment. Ultimately, the author manages “to embody the intersections of gender, class, race, and mental illness” (110). Wetzel says that Connie’s masculine society commits her “to a mental institution which is depicted as both a dystopia and microcosm of the broader society” (54). One would hope that such a facility would assist this unfortunate woman rather than becoming a tool in the hands of those who have the power to limit her abilities and choices in life. Actually, Sumbul says “the very beginning of the novel reveals that the present society is one of unquestionable masculine order in which women are deprived of any feelings and rights” (176). Her daughter was stolen from her, her lover was murdered, and she was placed on welfare. She is already inferior due to her ethnicity, gender, and social class, thus utilising further power and violence against her is unnecessary. Yet, in order to keep her under control and apply its ideological convictions about women’s status in general and brown people in particular, her society insists on additional violence.

A patriarchal society, on the other hand, categorises women based on their sexual relationships with males. In such a social system, a woman’s status is more similar to that of her husband than to that of other women, including patriarchy among brown people. Connie suffers because she is a woman; her husband, Eddie, hits her and eventually abandons her without a job or money, despite the fact that she is still his wife and bears his surname Ramos, according to state documents. He fixes so because she does not have “the money to divorce him for her desertion” (113).

In the same vein, Connie’s niece, Dolly, prefers Geraldo over everyone else, including her aunt and her pregnant child, in that patriarchal system. From the very beginning, the reader knows that Dolly’s father “washes his hands of” her. Thus, she finds no way but that “he (Geraldo) is my man” (24). Her societal responsibilities are to do whatever her partner wants her to do, even if that means lying. Through her dependency on a guy, she becomes passive and contributes to the current authoritarian system’s strengthening. Dolly simply confirms her husband’s accusation that Connie assaulted him and her. As a result, Dolly participates in the patriarchal society and accepts her fate.

Dolly is initially portrayed as a symbol of repressed female sex since she arrives at her aunt’s house bleeding and wailing after her husband, pimp Geraldo, had beaten her up. She is frequently urged by Connie to leave him, but she lacks the

confidence to do so. In the end, she betrays her aunt by allowing her father to confine Connie in a mental facility. Dolly afterwards appears to have found a new pimp who treats her a little better, but she is now hopelessly hooked to speed. So far, the ladies in this novel's fates have been fairly depressing: one is forbidden to leave a psychiatric facility because her brother believes she is insane, and the other is a prostitute and addicted to hard drugs. One would believe that some of Connie and Dolly's issues stem from their status as members of society's lower classes.

Connie time-travels by mistake to a dystopian universe that is an extension of Connie's existing culture after having the dialytrode implanted in her brain. This is the outcome of the type of experiment in which Connie is participating. When she meets Gildina, whose body she can see, she transfers a horrifying image of that future. "seemed a cartoon of femininity, with a tiny waist, enormous sharp breasts that stuck out... Her stomach was flat but her hips and buttocks were oversized and audaciously curved. She looked as if she could hardly walk for the extravagance of her breasts and buttocks, her thighs that collided as she shuffled a few steps." (288)

Gildina as a future woman is no more than a product that is kept as long as it is valuable for its operator. Gildina points out that "you can't get out of a contract unless you're bought out" (290). Women similar Gildina are "monitored like everybody else" in that dystopian future, and "from the electrical impulses" in their brains, they "can't lie" (298). In detail, Minico says "in Connie's reality and in Gildina's future, the female identity is shaped (and sometimes condemned) by sexuality, motherhood, economic condition and race" (10). Gildina is a more mature version of Dolly who accepts and participates in the patriarchal system's continuance.

Piercy goes even further in the future civilization, divorcing sexuality from production. This principle is emphasised by the usage of technology. Brooding machines are used to raise babies until they are ready to be born. As a result, Piercy deprives future society's ladies of the ability to bear children. When it comes to breastfeeding, each child has three mothers, with at least two of them agreeing to do so. Changes marking the end of gender roles are reflected in the male mothers. As Luciente points out, women and men are equal in every way education, work, sexual expression, and even motherhood.

Males have breasts and become moms for children, which Connie finds unusual. In Connie's modern society, mothers are expected to give birth and

breastfeed their children. Minico's existence is due to the fact says "in Connie's United States, women, especially poor and marginalized ones, are chained to stereotypes of motherhood and inferiority" (8). As long as men and women are treated equally in the future community, especially in what is thought to be women responsibilities in the present, the entire future society, including women, will prosper, discovers that "Our dignity comes from work. Everyone raises the kids, haven't you noticed? Romance, sex, birth, children—that's what you fasten on. Yet that isn't women's business anymore. It's everybody's" (251).

Even traditional parental power has been done absent with, and the experience of motherhood is shared among women and men, as "technology has been developed to gestate babies in a mechanical brooder and men have been enabled to breast-feed" (9). Motherhood is seen as a duty to be shared equally by each parent, regardless of gender. "In addition, critics have treated the novel as an allegory for the conflict in academia between dogmatic feminism and the commitment to motherhood" (5). "The deconstruction of power structures is continued on a linguistic level, where Piercy deletes the dimorphism of the objective and possessive pronouns 'his' and 'her,' which have been replaced with the unisex 'per' referencing the single personal pronoun 'person'"(10). Feminist futurists say that Piercy's novel's nonlinear and complicated structure leads to a more comprehensive feminist argument. This concept argues that, in order to deal with future feminist solutions, there are issues from the past that must be addressed.

Piercy's opinions are essentially those of the feminist movement. In Connie's present reality, each character in Mattapoisett has a counterpart, juxtaposing inequalities in personal power and thus potential for self-actualization. Connie's buddy Skip, for example, who was committed to a mental institution by his father because he is gay, reminds her of Jackrabbit, a bisexual person who is not only accepted but also immensely popular in Mattapoisett. Unlike the mental hospital, where all of the doctors are men, in Mattapoisett, "women have a special tradition and role in healing", (80) and positions of power rotate among men and women alike.

The image depicted here is of a malleable and manufactured femininity, which bears many resemblances to a stereotype that women are still required to live up to today. In contrast to this futuristic New York, women in Mattapoisett are treated equally to males. It's a very upbeat image of womanhood, yet it appears that in



Mattapoisett, femininity and masculinity have melded into something androgynous rather than maintaining their own identities.

As we can see from this excerpt, men and women in Mattapoisett are thought to be capable of undertaking the same jobs. The fact that the female sex no longer has the luxury of bearing children adds to this sense of equality. Children are conceived in brooders, and men can ‘mother’ them in the same way as women do, including breast-feeding. All of this appears to Connie to be incredibly unnatural, because she believes that the one thing that made women unique in the world was the ability to have children has been taken away from them.

With Skip, Jackrabbit, and Luciente, the novel explores the idea of queer characters. Piercy depicts Skip being committed to a mental institution for being gay, demonstrating her continued struggle with other people. Luciente also has a queer relationship with Diana, a friend. Through the hardships of LGBT characters, Piercy demonstrates that there is still progress to be achieved for those who are queer. In Mattapoisett, Connie goes on a trip with the LGBT characters, as she links gendered roles with the children’s parents. Luciente disproves this by demonstrating both masculine and feminine characteristics while in a queer relationship. Connie quickly adapts to this concept and comes to accept homosexuality, putting her patriarchal ideas of the past aside. Piercy’s portrayal of Connie’s adaption to Mattapoisett’s homosexual relationships furthers the novel’s thesis of queer progress.

The story places on the readers, to help woman like Connie grow up through the concrete, to consider a better way of life, a society with shorter work hours, the ability to choose to work on meaningful activities, and lifelong learning. Connie has had the opportunity to imagine a future free of patriarchy, androcentrism, and female oppression in the utopian world. Motherhood has unsurprisingly, been a major issue in feminist utopian works. As a result, it is an adequate medium for tracing the knowledge and difficulties of motherhood in a fictional non patriarchal culture.

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INSURRECTION AGAINST BEAUTY STANDARDS: A STUDY OF SCOTT WESTERFELD’S UGLIES

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Abstract

Uglies is set in a future post scarcity dystopian world where everyone is considered an “ugly, but turned “pretty” by extreme cosmetic surgery when they reach the age of sixteen. The novel addresses the concept of ideal beauty and explains in detail the pros and cons of undergoing the Pretty procedure. It also deals with the social divides caused by the beauty standards. Depending upon the beauty standards, the people in the society are classified and placed in different places. This study deals with rebellion against the ideal beauty norms set by the government and validates the true form of ideal beauty.

KEYWORDS: Beauty standards, ugly, pretty, cosmetic surgery, rebellion.

INTRODUCTION:

Scott Westerfeld is an American writer of science fiction and young adult fiction. He is best known as the author of the Uglies quartet which also includes the books Pretties (2005), Specials (2006) and Extras (2007). Uglies is told from the third-person-limited point of view. The story utilizes a diction that is easily accessible to young readers. Uglies is an excellent example of a novel that falls into four different genres. They are science fiction, dystopian fiction, young adult fiction and coming-of-age novel.

Uglies is related to the concept of beauty. Beauty is one of the most important characteristics to a woman, both physical appearance and behaviour. These features are called the concept of beauty. According to Seyyed Hossein Nasr in Mehdi Aminrazavi and David Ambuel’s Philosophy, Religion and the Question of Intolerance, “To live in this world is to live in a world of duality and also opposition . . . such as harmony and complementarity as seen in the yin and yang in the Chinese tradition . . . as can be seen in such realities as truth and falsehood, beauty and ugliness, or goodness and evil” (44).

Beauty standards create social divides in people and society. There are many social age groups based on the beauty standards. They are Littlies, Uglies, New Pretties, Middle Pretties, Late Pretties and Specials. Littlies are young, cute and innocent children. They live with their parents in the suburbs surrounding New Pretty Town and they will attend elementary school until they turn twelve. They turn uglies during their pre-teen years. When

children turn twelve years old, they are considered “ugly” because of the burgeoning physical developments experienced by all pre-teens and teens. Ugliers are then moved out of the suburbs and live in monitored dorms in Uglyville where they attend middle and high school.

New Pretties arise after uglies undergo surgery and are moved into apartments or mansions in New Pretty Town. New Pretties do not have to work. Middle Pretties pick their professions and go through a second minor operation that makes them look older and wiser but still beautiful. Then, they move to the suburbs and are allowed to marry and have children but are encouraged to do so only every ten years. Late Pretties or Crumbliables are parents, grandparents, great-grandparents, etc. They live in assisted living homes and receive life extension surgery that allows them to live into their middle hundreds and two-hundreds.

Specials are described as frighteningly beautiful and as a “cruel pretty” with features like large coal black eyes, sharp cheekbones, etc. They undergo a special surgery that gives them the ability to feel vibrations with their hands, enhanced senses, muscles sheathed with self-repairing mono filament, sharp orbital alloy teeth, incredible reflexes, and bones made out of aircraft ceramics.

The societies are Rusty Ruins, Uglyville, New Pretty Town and Smoke. The Rusty Ruins used to be a thriving epicentre of Rusty civilization, but once the petroleum they all depended on was mistakenly transformed into phosphorous, it only took exposure to air for the substance to ignite and the city to go up in flames. The Rusty Ruins symbolize the fragility of civilization. The ruins stand as a reminder that all civilizations have a fatal weakness. Uglyville is a section of the city where all the uglies live. New Pretty Town is where all the Pretties live. The Smoke is a hidden settlement in the wilderness where uglies go to escape from having to get pretty surgery. The smokies live a primitive existence but they put their energy into having a library because they value knowledge and history instead of drinking parties.

Uglies is set in a future post scarcity dystopian world in which everyone is considered an “ugly”, but then turned “pretty” by extreme cosmetic surgery when they reach the age of sixteen which makes them happy, carefree and gorgeous. It tells the story of a teenager named Tally Youngblood, a resident of Uglyville, is herself an “ugly” and is eagerly anticipating her birthday and the procedure that will transform her into a blissful and lovely “pretty”. Tally’s best friend Peris has already had the Pretty procedure and she sneaks into New Pretty Town to see him. This act nearly gets her captured, but in the turmoil, she meets a new best friend named Shay. Tally and Shay share the same birthday and are expected to undergo the operation at the same time. However, the night before procedures, Shay tells

Tally that she plans to run away to an outside settlement called The Smoke, outside the reach of the governmental powers that control the uglies and the pretties. Shay disappears and is assumed to have gone to the Smoke.

Tally is forced into locating Shay and leading government agents to the rebel settlement. If she does not, she is told that she will never be given the procedure that will turn her into a pretty. Tally reluctantly becomes a spy and sets out to locate the Smoke and her absent friend. There, she begins to realize that maybe everything she's been told about uglies, pretties, and smokies isn't all true, and that the residents of the Smoke are rebelling for a very good reason. Her conscience keeps her from betraying the rebels, but her act of heroism leads her to consequences that will affect her forever. A budding romance between Tally and David, one of the smokie leaders, helps her see the moral difficulties with the Pretty procedure, and brings up questions about what the government surgeons do during the operations to keep the population under control.

Westerfeld showed the government and society that oppressed women in order to fulfil the concept of ideal beauty in which Tally says, “Everyone judged everyone else based on their appearance. People who were taller got better jobs, and people even voted for some politicians just because they weren’t quite as ugly as everybody else” (44). The concept of ideal beauty in a society plays a major role in constructing society member’s perception about the definition of beauty and also ugliness.

The result of plastic surgery cannot be decided by the one who undergoes it, but it is decided by the government as it is mentioned that “The doctors pretty much do what they want, no matter what you tell them” (41). The government tries to eliminate one’s uniqueness and make everybody’s physical appearance almost the same. “They rubbed you raw, and you grew all new skin, perfect and clear. The old marks of accidents and bad food and childhood illness all washed away” (25).

The uglies are thoroughly measured by the city surgeons in preparation for the operation shortly before their sixteenth birthday. During the process, their faces are given perfect symmetry and their bones are all replaced either stretched or shrunk to a more attractive physique. Nose cartilage and cheekbones are stripped out and replaced with programmable plastic. Eyes are laser-cut for a lifetime of perfect vision where reflective implants are inserted under the iris to add sparkling gold flecks to their indifferent brown eyes.

During the Pretty Operation, muscles are trimmed up with a night of electrocize. Baby fat are sucked out and teeth are replaced with ceramics as strong as suborbital aircraft wing.

The patient's skin is extremely sensitive for two weeks after the surgery and the sensitivity is similar to having a sunburn and is said to be the only part of the operation that hurts. Tally feels that "Two weeks of killer sunburn is worth a lifetime of being gorgeous" (98).

The plastic surgery rules are applied to everyone after they turned sixteen that makes them perfect in beauty and health. The Operation completely overhauls a person's body structure and also includes lesions upon the brain, which makes them compliant and less likely to cause conflict. The lesions also tend to "dumb them up." Another interesting aspect in the concept of ideal beauty is about behaviour. Uglies mentions about the behaviour of men and women, which are significantly different from each other. The behaviour changes after the process of plastic surgery because of the brain damage caused by the plastic surgery. Women are portrayed as less smart and they often say and do something stupid.

Peris, Tally's friend, is one of the proofs that men do not get brain damages from the plastic surgery. He acts like the same person even after the surgery. "His eyes narrowed, and for a moment he looked like the old Peris: serious, thoughtful, even a little bit unhappy" (125). Even after the operation, Peris still cares about Tally. He does not feel clumsy when he takes care of Tally who is still ugly instead he listens to Tally's problem and tries to convince her not to worry and that she will get the operation soon.

Peris' behaviour is very different from Shay, Tally's friend, who finally gets the plastic surgery before Tally can get it. Shay becomes a very different person. She becomes someone who is easy to grumble and keeps complaining about life as an ugly because although she has already turned pretty, she is assigned by the government to live with the rebels so that she can persuade them.

Everyone can design their own ideal physical appearance in Uglyville although the doctor will not consider the design and still change everyone based on the concept of ideal beauty. Tally wanted to have "almond-shaped brown eyes, straight black hair with long bangs, the dark lips set to maximum fullness" (39-40). The way Tally reacts to the pretties shows that the ideal beauty in her society has already had a fixed rule, and all of the society members have already known the concept because they were taught about it since their childhood.

In Uglies, people under sixteen are placed in a dorm and are made to attend a school that teaches about the concept of ideal beauty. In the school, children are taught about the conflicts that can rise because of the physical diversity. They were taught that people killed one another because they have different skin colour. It is the reason given by the school to children in order to justify the rule to get plastic surgery and make everybody equal. It can be

seen that the school has a big role in creating children's mind about the danger of physical diversity and suggests them to do the plastic surgery to make everyone equal so that there will be no jealousy and conflicts.

Relating to the cult of beauty is Naomi Wolf's concept surrounding the beauty myth which she discusses in the book *The Beauty Myth: How Images of Beauty are Used Against Women* (1990). According to Wolf, "If a person thinks or feels that they are ugly, it does not matter what they look like" (272). The subjection to society's absurd beauty and aesthetic ideals begins during childhood, so the people in Tally's society are already manipulated into thinking that society's norm for beauty is the only correct one. This is evident in Tally where she states multiple times how everyone is ugly before going through the Pretty Operation.

Tally joins with the rebel group in the Smoke and plans to rebel against the city after she comes to know that the surgery includes brain lesions. Tally, with the help of her rebel friends, carries out the rebellion rather than hiding all day in the Smoke City like every rebels did before. Tally's rebellion starts before her operation, when she performs different pranks and tricks that go against the society's rules.

Tally's first act of rebellion against society's beauty standards is when she chooses to stay in the Smoke and join the rebels living there. Sonya Sawyer Fritz, in her essay *Girl Power and Girl Activism in the Fiction of Suzanne Collins, Scott Westerfeld, and Moira Young* (2014), states that for Tally, "the running away to the Smoke is not a rebellious act, it is the choice to stay that matters" (20). She is forced by the Special Circumstances to find the Smoke and go there with an intent to expose the rebels living there, but Tally begins to feel sympathy for the rebels in the Smoke and makes the choice to sever her ties with the Special Circumstances. She decides to believe in what she knows to be true, instead of what the society and the Special Circumstances told her.

In addition to Tally's first rebellion against the society's beauty standards, her choice to stay "ugly" in the Smoke and to not have the Pretty Operation can also be seen as the start of her continuous rebellion against the societal control. The rebellious acts committed by Tally are not only physical but also intellectual since she is able to fight off the brain lesions without medication. Tally's ultimate act of rebellion against societal control is just being herself. According to Fritz, the motivation behind Tally's rebellion is a "desire to care and protect others" (27). An example of this can be seen at the end of the book, when Tally is willing to sacrifice herself by turning herself in to undergo the Pretty Operation while David refuses to do so. She does this so that she can be the test subject for the cure of brain lesions, which suggests that Tally is willing to risk losing her identity in order to save her friends.

This tends to suggest that Tally never stops trying to bring down her society's leaders even though she might lose her self-identity, memories and freedom.

Tally performs many physical rebellion of not letting herself be controlled which is considered as her most momentous conquest. The driving force behind Tally's motivation to rebel against the society is her desire to stay in control over herself and to protect those around her, which is shown in Tally's willingness to risk losing herself in order to protect her friends' self-identity. Although Tally wants to stay in control over herself, it can be concluded that Tally's main concern throughout the novel is not on herself but on those around her as she fights against the societal control and for people's rights to be how they want to be.

Ultimately, Tally decides to rebel against the government because the government had already oppressed the women for their own purpose. In *Uglies*, women are meant to be tamed by men and government by eliminating their intelligence during the plastic surgery. Women cannot decide their own life rather they are controlled by the government. Tally decides to be a heroine who fights against the government because she believes that women are meant to be equal with men. Tally accepts to see herself as a heroine, and believes that women can still be good women although they must be against the myth.

Tally's experience in the Smoke and most especially her romance with David, complicate her understanding of beauty. She realizes that it is a relative and subjective term applicable to a person's inner as well as their outer self. According to Wolf, "The beauty myth is always actually prescribing behaviour and not appearance" (14). David, who is against the Pretty operation, confesses to Tally that "What's inside you matters a lot more" (278). He surprises Tally by saying that he was attracted to her initially because of the scratches on her face. He concludes that, "What you do, the way you think, makes you beautiful" (279). Tally's initial thought of beauty standards takes a shift when David reveals what's more beautiful and what matters the most.

The novel *Uglies* is significant because in today's world, most of the people consider themselves ugly depending upon their appearance. They worry because they think that they lack the perfect beauty standards which are considered as pretty. People see only the external appearances to conclude if they are pretty or ugly. Beauty is actually based on behaviour and not on external appearances. Tally is satisfied in being ugly, and she refuses taking the Pretty Operation in the beginning but finally accepts to undertake the procedure only to test the cure in order to relieve the people who have already undertaken the procedure. Therefore, people should not consider themselves ugly and take cosmetic surgery like Tally's society rather



they should feel that they are beautiful and unique in their own way even if they lack ideal beauty standards.

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RACISM IN THE ROOT OF DIASPORA IN NOVIOLET BULAWAYO'S *WE NEED****NEW NAMES*****Bagavathi.S**

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Abstract:

The bruised voices of African immigrants in America have been portrayed in contemporary African literature, such as NoViolet Bulawayo's *We Need New Names* (2013). According to Bulawayo's depiction, Darling is among those who are subjected to racial discrimination which was never an issue for them back in their countries. This article attempts to bridge the literary field with social psychological theories by examining the influence of African immigrants' social identifications and categorizations, using Tajfel and Turner's Social Identity Theory. Moreover, the concept of individual mobility is explored as a coping mechanism by the immigrants to deal with their negative social identity. The second objective is the identification of the various phases that African immigrants go through during the process of becoming black. This can be achieved through the use of William Cross' Nigrescence Theory. A significant contribution of the present paper lies in analyzing African immigrants from a different perspective, focusing more on the journey of self-acceptance and the process of becoming black through the Nigrescence theory. The inclusion of these theories, namely Social Identity and the Nigrescence theory, is a broadening input in literary analysis since they have not been applied in previous literary studies.

Keywords: Immigration, Nigrescence Theory, NoViolet Bulawayo, Social identity theory (SIT), *We Need New Names*.

Introduction:

Race is nothing but the complexion of a human being. Everyone is equal, but British people after colonizing every country they made every individual to feel about their skin complexion. As British is of fair complexion. So, with this they colonized everyone and made everyone to have an inferior feel about their complexion. One such people caught in their trap is Africans. Generally African people are addressed by their dark complexion. So British people took this as an opportunity to keep them in their control.

Race is a constructed social category, designed to stratify people and establish meaning in a social context. Racism encompasses a web of economic, political, social and cultural structures, actions, and beliefs that systematize and ensure an unequal distribution of

privilege, resources, and power in favor of the dominant racial group and at the expense of all others. As a form of bias against social groups, racism encompasses three related but separate aspects: prejudice (emotional bias), stereotypes (cognitive bias), and discrimination (behavioral bias). Prejudice refers to an emotional reaction to another individual or group based on preconceived ideas about them. Stereotyping is the projection of an individual's thoughts, beliefs, and expectations onto another individual without first obtaining factual knowledge about them. Discrimination is the action of denying equal rights based on prejudice and stereotypes.

In the work *We Need New Names*, Noviolet Bulawayo has done her work perfectly by explaining the problems of the protagonist Darling. She is portrayed as a small girl who has been tolerating all her problems which comes because of her race.

For being a Zimbabwean girl, Darling made decision to exile from her native and nation, because of the political war which took place in her country. So, she moved to America, where her aunt lives. There also she faces a lot of problem, as she goes with an expectation as America was a land of dream for the new entries. After going there only she realized that her imagination about America is false. Then she started to cope up with her new culture and circumstances, but there also she lags in making an equal move with it. So, we will know how the writer has explained the situation prevailed in Zimbabwe as well as in America.

The latter is a continuation of her earlier short story “Hitting Budapest” (2010), which won the Caine Prize for African Writing. *We Need New Names* revolves around the journey of Darling from Zimbabwe to America. During the early 2000s, Darling used to live in Zimbabwe where her home was bulldozed due to a political turmoil. She was obliged to leave and settle in a new village they called Paradise: “We didn’t always live in this tin, though. Before, we had a home and everything and we were happy. Now all we have is this small bed that sits on some bricks and poles”(62-63).

Darling is depicted as a very smart and energetic girl who spends most of her time playing different games with her childhood friends, “They are the most important thing to me and when I’m not with them I feel like I’m not even me” (94). Together, they go to Budapest, where white rich people live, and steal guavas since it is the only source of food they could possibly find, “We just eat a lot of guavas because it is the only way to kill our hunger” (16). The narration differs from an engaging, energetic and exquisite in Zimbabwe into a quiet, introvert and broken voice of an immigrant in America.

The wretched situation that they were living in made the citizens leave the country in order to find jobs and be able to take care of their families. Darling's father went to South Africa for the sake of working but he ended up leaving his wife and daughter without any form of support. This behaviour left an enormous impact on Darling as a young girl who needs not only shelter but her father's attention as well, she says: "Now Father is in South Africa, working, but he never writes, never sends money, never nothing. It makes me angry thinking about him, so most of the time I just pretend he doesn't exist; it's better this way" (22-23). However, she cherishes his existence and tries not to forget him, "by looking for him in the faces of the Budapest men, in the faces of my friends' fathers" (93). Bulawayo depicted the massive traumatization caused by the armed mob rioting on the inhabitants of Paradise in general and on Darling specifically. She suffered from nightmares which kept her awake all night fearing the returning of bulldozers:

Now I am counting inside my head; this way I will not sleep. Nobody knows that sometimes I do not sleep... Even if I want to sleep I cannot because if I sleep, the dream will come and I don't want it to come. I am afraid of the bulldozers and those men and the police, afraid that if I let the dream come, they will get out of it and become real. I dream about what happened back at our house before we come to paradise. I try to push it away but the dream keeps coming and coming. (64-65)

This psychological instability at her age is quite effective and it destroys her sense of steadiness and well-being. The sudden incident left an instilled shock as Darling describes the terrible situation surrounding her at that moment, "When the bulldozers finally leave, everything is broken, everything is smashed, everything is wrecked. It is sad faces everywhere, choking dust everywhere, broken walls and bricks everywhere, tears on people's faces everywhere" (66). Her insecurity gets deeper when they move to Paradise and her life turns upside down because they become deprived of everything. The inhabitants feel disappointed by those who destroyed their land and properties, since they are supposed to stand by their side against the white colonizers and not the opposite, "Better a white thief do that to you than your own black brother. Better a wretched white thief" (75).

The white settlers in Rhodesia institutionalized a system of racial segregation against the blacks and benefitted from the lands. Therefore, the white colonizers became more powerful and affluent after taking over the agricultural lands unlike the aboriginal people, black Rhodesians who were deprived of their rights in their own country.

Bulawayo highlights the injustices that the indigenous people have endured during the colonialism era through the voice of a child who can still see its lasting impact. Darling

has a sarcastic way of thinking about the real intentions of whites while colonizing her country as people will never forget or forgive the crimes committed by the white settlers, “I don’t know what the white people were trying to do in the first place, stealing not just a tiny piece but a whole country. Who can ever forget you stole something like that?” (20).

Zimbabweans have always been charmed by the whites, and have surrendered to the belief of the white supremacy which contributed to their immigration fantasies. Moreover, the tragic political, social and economic situation in Zimbabwe pushed the citizens to do anything in order to get out of country, “For the visas and passports, we begged, despaired, lied, groveled, promised, charmed, bribed- anything to get us out of the country” (240). Because they were always positioned outside the mainstream, Zimbabweans felt what is it like to be visible, recognized and worthy, even if that means to leave towards the unknown. This white supremacy and the dream of immigration exist not only with adults, but with children as well: Who doesn’t know that the U.S.A is the big baboon of the world? I feel like it’s my country now because Aunt Fostalina lives there, in Destroyedmichygen. Once her things are in order she will come and get me and I will go and live there also. (49).

Darling’s self-esteem changes throughout the novel according to her social in-group and she strives to attain a satisfactory social identity.

Immigration obviously means a new society and brings radical changes for immigrants who find themselves in a whole different world. They immigrate with the eagerness to absorb the freshness of their dream country. Being an African immigrant in America, Darling is exposed to harsh racist treatments which made her very upset, “When I first arrived at Washington I just wanted to die... I just felt wrong in my own skin, in my body, in my clothes, in my language, in my head, everything” (165). Going through such traumatizing experience shook Darling’s self-esteem and disturbed her self-perception because she was not only young and vulnerable, but because she was never treated like that before. She was always the loved friend and daughter back in Zimbabwe unlike her estranging status in America.

Darling could not support the disrespectful, degrading treatments of the Americans and thought about finding a solution for that, “I have decided the best way to deal with it all is to sound American... I also have my list of American words that I keep under the tongue like talismans, ready to use” (194). The importance of language in general and acquiring an American accent more specifically is highlighted by Bulawayo to stress the initial step toward seeking acceptance in the new society. Sounding an American will ease and speed up the process of assimilation and it will cover the smell of immigration, “I don’t know why

Aunt Fostalina doesn't think to learn America speech like this, seeing how it would make her life easier so she wouldn't have a hard time" (194).

Darling finds herself automatically categorized with Africans in America, this categorization imposed a low status and more marginalization. Hence, she refuses to belong to an inferior, subordinate group. Self-esteem is one of the most crucial motives that individuals seek in an in-group and its fulfilment will certainly strengthen the person's social identity. Darling's attempts to attain acceptance into an American ingroup is initiated with her American accent regardless of the others' negative remarks, "tryna sound like stupid white folks" (222). Speaking and acting like Americans swallowed Darling's attachment to her friends and family who once meant the world to her, "With time I stopped writing altogether, I just started putting it off... before I knew it I'd lost touch" (188).

Furthermore, Darling starts to be ashamed of how people from her country keep calling to ask for money and support, "The calls just keep coming and coming like maybe they've heard Aunt Fostalina is married to the Bank of America" (204). Their calls reinforce her belief that she came from a subordinate social group which will contribute to further derogate her identity among Americans.

Darling's decisions are basically enacted out of her negative discriminating experience since racism against blacks is found to be among the main reasons of anxiety, depression, suicide. Her identification with a different in-group got her carried away with being an American and living according to the America social norms, especially with her reckless friends who encourages her to watch porn videos on the internet to explore their sexualities. Darling has mixed feelings regarding the flicks they were watching sometimes they were interesting, exciting, quiet and at other times they were embarrassing, nasty and creepy.

Being wild and careless is something that Darling learns in America so that she will not be entitled a coward. Therefore, she pretends to be uncaring while she is hanging out with her friends who steal the car of Marina's mother and allow Kristal to drive it though she is violating the law since she does not have a driving license, "Kristal isn't old enough to have a license but that doesn't mean she can't drive" (215). At a moment, police follow them, "we hear the wailing sound, and we know that the police are chasing us. All the fun comes to a sudden end" (218), which frightens them especially Darling, "I think about opening the door and running, just running, but then I remember that the police will shoot for doing a little thing like that if you are black" (219).

Putting her life at risk makes Darling feel uncomfortable and she cannot relate to her new, fake behaviour that she is wearing to impress people and to be accepted among Americans. She suddenly becomes aggressive against her friend and she blows up the truth about how she feels about her, “When I first met you, I couldn’t understand anything coming out of your mouth, not a single word, nada, and you sit here and say you are American and that you speak English!” (221). Honesty relieves her a little bit but she cannot completely feel at ease with herself anymore.

All these drastic changes lead Darling to reach a state of instability and fragmentation. Her identity shatters between her pre and post immigration attitudes, “It’s hard to explain, this feeling; it’s like there’s two of me” (210). Bulawayo deliberately shows this struggle that Darling undergoes to portray the dark side of the complete accumulation and assimilation into the host culture. Her categorization with the dominant social group is not enough to satisfy her individual needs.

Darling is torn between keeping up with her new American identity, which does not resemble her, or cherishing her African identity that she seems to miss. Her relationship with her friends and family trembles since she arrives to America especially when she stops writing to them. Cutting off all the ways of communication burdens Darling’s conscious and the feeling of guilt overwhelms her, “I feel a little guilty but I brush the feeling away” (210). There is an inner battlefield between her guilt and aspirations. Darling struggles when she reminisces her past and what she left behind, “I missed them, missed them very much, and there were these times when I’d be doing something and get this terrible feeling of guilt for not keeping in touch” (188). Then she remembers what she could be in her dream country, “You are in America now and you can actually be anything you want to be” (158).

Darling reaches a state where she criticizes all the American things that are supposed to please her after encountering various obstacles and losing her self-esteem:

No matter how green the maize looks in America, it is not real. They call it corn here, and it comes out all wrong, like small, sweet, too soft.

I don’t even bother with it anymore because eating it is really a disappointing thing, it feels like I’m just insulting my teeth. (164)

This new habit makes Darling partly satisfied since her America is not that perfect and at some points it seems even worse than Zimbabwe:

In America, the fatness is not the fatness I was used to at home. Over there the fatness was of bigness... It was fatness that didn’t interfere with the body; a neck was still a neck, a stomach a stomach... but this American fatness takes

it to a whole ‘nother level’: the body is turned into something else- the neck becomes a thigh, the stomach becomes an anthill, an arm a thing, a buttock a I don’t even what. (171)

This denunciation does not mirror her American identity. Instead, it gives her hidden African identity the chance to see the light under the imprisonment that is imposed on it. Darling spends a long time ignoring her feelings and the longing to her family to the point where she is surprised when she confronts her emotions, “Today, it’s Mother on the phone. I am glad to hear her voice so I start smiling. I miss her so much sometimes it makes me dizzy but then there is nothing I can do about it” (204). The old Darling has very strong ties with her beloved friends whom she intentionally ignores in America:

I get goose bumps just from hearing them talk. There is a strange feeling coming over me and I feel this dizziness and I have to sit down. Time dissolves like we are in a movie scene and I have maybe entered the telephone and travelled through the lines to go home. (205)

The distant meeting of her friends through a tiny screen leaves an immense effect on Darling who surrenders to the inner yearning she holds for years:

Sbho is standing there watching her and eating a guava... I get a strange ache in my heart. My throat goes dry; my tongue salivates. I am remembering the taste of all these things, but remembering not tasting, and it is painful. I feel tears start to come to my eyes and I don’t wipe them off. (209).

This moment takes her back home when she was still a child and her only interest was to have fun with her friends while stealing guava to silence their hunger. Darling could not disregard and numb her feelings anymore as she feels more comfortable when she freely let go her yearning and she no longer hides it as she would usually do. Silencing her true sentiments is not the smartest thing that Darling opts for owing to its negative contribution to her identity deconstruction. Ignoring her inner voice and depersonalizing herself from the social group that she really belongs to shatter her identity and she never completely feels her true sense of self.

Throughout the narrative of the novel, we sense the clear and profound impact that the whites’ supremacy ideology has left on Darling’s personality. She is raised to the belief that, “everything in America was better” (189) which inevitably means that America is the dominant, superior country in comparison with home i.e., Zimbabwe which becomes the subordinate, uncivilized and miserable place. Privileging the white people and not just their countries is much worse as it made Darling always, “wonder how a white person’s hair feels

to the touch” (181) and feel the honour to speak to a white person, “I’m just proud that I’m finally talking to a white person, which I haven’t ever done in my life” (129). If talking to a white person in Zimbabwe is regarded as something to brag about, then it is no wonder that living among them makes Darling impatient for their acceptance and approval.

Moreover, the deprivation and poverty that Africans suffer from plays a vital role in encouraging immigrants to assimilate into the host country as they find what they have always been lacking. For Darling, it was food that mattered the most, “there is food to eat here, all types and types of food” (153). She suffers from hunger back in Zimbabwe and this makes her remember the times when she and her friends used to still guavas just to feed themselves, “In America we saw more food than we had seen in all our lives” (238). Another surprising news is the prohibition of child beating which is normal in Zimbabwe, and plastic surgeries that she looks at with amazement:

How America surprised us at first. If you were not happy with your body you could go to a doctor and say, for instance, Doctor, I was born in the wrong body, just make me right; Doctor, I don’t like this nose, these breasts, these lips. We looked at people sending their aging parents away to be taken care of by strangers. We looked at parents not being allowed to beat their own children. We looked at strange things like these, things we had never seen in our lives. (239)

The huge difference between the home and the host cultures makes America even more interesting for Darling.

Darling recalls the words of her friend Stina about the country and they keep ringing in her ears due to their deep meaning which were not quite significant until she lived in America:

Stina said that a country is like a Coca-Cola bottle that can smash on the floor and disappoint you. When a bottle smashes, you cannot put it back together... Stina also said leaving your country is like dying, and when you come back you are like a ghost returning to earth, roaming around with a missing gaze in your eyes. I don’t want to be that when I go back to my country. (160).

One day, Darling encounters a harsh criticism from her mother through a phone call, “I see that America has taught you to speak English to your mother, and with that accent. He-he-he, so you are trying to sound white now!” (204). Her mother’s denunciation leads Darling to unconsciously react as Americans do when they argue with their parents, “I start to call her crazy but I hold it and tell myself that it is one of the American things I don’t

want to do” (204). This reaction makes Darling think twice about her attitude and the values she learned back in Zimbabwe where elders’ respect is a must.

Later, Darling hears the voices of her childhood friends and they take her back to relive the past:

I get goose bumps just from hearing them talk. There is a strange feeling coming over me and I feel this dizziness and I have to sit down. Time dissolves like we are in a movie scene and I have maybe entered the telephone and traveled through the lines to go home. (205)

The connection with her family and friends is an alerting signal for Darling to realize how much she misses her childhood, her stealing guava adventures, and her old self around the people who truly loved her, “Sbho is standing there watching her and eating a guava... I get a strange ache in my heart. My throat goes dry; my tongue salivates” (209). Once she arrives to America, she does not allow herself to surrender to her longing and she repeatedly ignores the feeling of guilt of not keeping in touch with her friends, “I feel a little guilty but I brush the feeling away” (210). However, at this stage Darling allows herself to cry for the yearning that has been imprisoned for years. She reaches a state where she could no longer suppress her feelings, “it is painful.

I feel tears start to come to my eyes and I don’t wipe them off” (209).

Another essential encounter is the fact that Darling’s friend Chipu who was impregnated at a very young age had a daughter and she named her after Darling, “they claimed they decided to name her after me so there would be another Darling in case something happened to me in America” (210). It is a good initiation from her friends who like to feel her presence through naming Chipu’s daughter after Darling but she could not completely swallow this act. This is like a call for the death of her old self since she left her country and stopped talking to her friends. Thus, Darling becomes confused and uncomfortable, “It’s kind of cute, but I don’t know how to feel about it, somebody being named after me like I’m dead or something” (210).

Darling’s desire to go back to Zimbabwe is so elevated the more she spends time in America and she keeps complaining about it, “In America, roads are like the devil’s hands, like God’s love, reaching all over, just the sad thing is, they won’t really take me home” (191). Darling insists on the different meanings of home according to every person, “When somebody talks about home, you have to listen carefully so you know exactly which one the person is referring to” (192). She further elaborates that, “There are two homes inside my head: home before Paradise, and home in Paradise” (191) but she does not mention America

as a home for her. The same goes for her mother and her Aunt Fostalina, “There are three homes inside my mother’s and Aunt Fostalina’s heads: home before independence... Home after independence... And then the home of things falling apart, which made Aunt Fostalina leave and come here” (191). Darling comes to the realization that America will never be home for Black immigrants.

This awareness leads Darling to excessively think about going back home but Aunt Fostalina does not allow her, “You came on a visitor’s visa, and that’s expired; you get out, you kiss this America bye-bye” (189). Since Darling’s studies are not completed, she could not move out of America until she gets her diploma, which she is hardly working for to pay her tuition fees. The financial dependency that Darling undergoes ties her in America. Darling came to America primarily to study; and not completing this goal prevents her from leaving. Even when choosing her field of study at the University, she is limited by choosing only the ones that really matter in America, “These... are the careers that count, and I didn’t come all the way to America to do meaningless stuff and be nothing” (275). Therefore, Darling’s desire to go back home is put on hold until she completes her studies and attains her financial independence, so that she could go back to Zimbabwe without waiting for the permission of Aunt Fostalina.

Bulawayo portrayed the life of African immigrants in contemporary America through knitting a well-crafted story that captures the journey of a young Zimbabwean female who immigrates to the United States with a luggage of dreams. Eventually, immigrants suffer from a negative social identity due to the accumulated deceptions, and they struggle to cope with all the changes that they encounter in a very short time. By projecting the concepts of this theory on the immigrant characters of the selected novel, it has been possible for the readers to address the impact of racial discrimination and social inequality in moulding the African immigrants’ racial identity. The Nigrescence theory operates as a mirror to the process of how an African immigrant embraces his black identity through protruding out the pervasive social and psychological trauma that Africans endure. It has been of great importance to dismantle the various social identifications and categorizations that immigrants adopt for the sake of gaining social recognition.

Moreover, the second aim of this study has been to analyse Darling’s process of becoming black utilizing Cross’ Nigrescence theory. As a result, Darling has experienced a drastic social and cultural change after her immigration which was a tough challenge for her to retain a stable identity. Therefore, she socially identified and categorized herself as an American which resulted into a distorted and ambiguous identity. Darling has gone through



various stages to finally reach a state of self-love and acceptance as an African instead of forcing herself to become an American. This is the auspicious outcome that this study strived to highlight because Darling mirrors what a great number of immigrants go through. At the end, it is crucial to emphasize on the struggle that immigrants endure during their journey of self-discovery due to the difficulty to pass from self-hatred to self-love. The immigrants' process of appreciating their African identity is our most celebrated finding especially that it is derived from a literary analysis through the application of enriching social and psychological theories. This study paves the way for other future researches in the literary field using the social identity and Nigrescence theories to further understand the immigrants' displaced identities and how they can embrace their black identity after immigration.

MEDITATION ON WOMANHOOD IN SYLVIA PLATH'S *THE****BELL JAR*****M. Cigorniya**

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Abstract

This study argues that the 1950s American society creates emptiness to the protagonist of *The Bell Jar*, Esther, as she tries to develop her female identity in the American society. The American society obligated women to be submissive to their husbands. Women were expected to satisfy their husband's sexual desires and become mothers. They have to sacrifice their own passions and desires in order to take care of the children. The paper sheds light on other reasons behind the protagonist's emptiness like being different from her society in general and mother in particular. She empties herself from the conventional thinking among American women, where they lack the choice to change anything concerning the world. Esther does not have the desire to live within the confinements of the societal gender roles; therefore, she separates herself from her family and environment. The study illustrates how the psychological trauma, inner absence, and depression empties the protagonist. She misses her deceased father. What is more, his absence is one of the main reasons her miserableness, depression and madness. Additionally, the meaninglessness in her life makes her unable to enjoy her life to the fullest. Thus, the state of depressed, controlled, oppressed made her more emptied.

KEYWORDS: Madness, Identity, Trauma, Emptiness.**Introduction:**

Women's literature presents a unique view into the female American experience. Female authors were fabricating a place for themselves in the literature. The feminist movement called into the query the aspect of women in the society and female authors acknowledged by establishing works presenting strong, self-resistance, intelligent women. Women's literature gained extensive eminence by the end of the nineteenth century. Female writers resist for approval in the literary society in spite of existing in the benevolent society. Women's literature echoes the feminist movement through subject matter, characterization and situation. American women writers who have made significant contribution to the field. The list includes many familiar and great American female writers such as Maya Angelou, Emily Dickinson, Toni

Morrison, Anne Sexton. The women represented have won every major writing prize of the 20th century.

M.L Rosenthal while making a review on Lowell's *Life Studies* coined the term "confessional poetry". The preoccupation of confessional poetry were private humiliations, sufferings, nakedness of emotion, alcoholism, mental breakdown, confinement in a mental institution, relationship with one's parents and relations, self-destruction. The works of these confessional poets must be placed in the context of not only private confessional poetry but of the poetry of madness as well.

Sylvia Plath, who belonged to this school of confessionalism is certainly concerned with self as victim. Sylvia's poetry exhibits the feminist consciousness. But she wrote and published her poems before the feminist movement began in America. She stands, however, as a milestone in women's movement. Her poetry has those characteristics of the feminist movement with confessional mode. Plath transcribes her private anguish into fiction, and *The Bell Jar* is a window into the author's mind.

The Bell Jar is about a woman struggling to become whole. In this self-expressive novel, Plath's protagonist, Esther Greenwood, throughout the novel is harried and haunted because of a very fragile and vulnerable self. She is an unwilling captive of her background and conditioning; external familial and social pressures war with her natural instincts and her level of self-confidence is far too low for those instincts to assert themselves sufficiently. The discussion here does not probe deeply into the intricacies of the incidents presented in the text, but confines itself to only a few deliberations regarding Plath's attitude to a woman's place in the society, particularly in conjunction with man. The indignation and angry outbursts of the protagonist should be viewed as a sign of Plath's new attempt at artistic independence in the final months of her life. She unburdens herself of a male god at the center of her universe and also frees her from the restraints on her imagination.

In *The Feminine Mystique*, Friedan refers to "the sophisticated trappings" (38) in which women were caught. Society wants man as well as woman to believe that what a man needs is a mate whereas what a woman needs is security. Buddy's mother endorses the male chauvinistic ideas. She thinks, talks and acts like male chauvinist. She appears a ventriloquist of the male chauvinistic world when she says, "What a man is an arrow into the future and what a woman is the place the arrow shoots off from" (57). Male dominated society ensures that woman never becomes an arrow.

The Bell Jar is not merely a record of the conflicts and cross-currents in Plath's personal life leading to her suicide attempt and final recovery. Nor is it just an attempt of the author to come to grips with those shattering personal memories through a literary rendering of a phase of personal misery. Literature is not merely for her pathological value. It is a creative recording of her personal experiences, and the novel, without even the knowledge of biographical details infused into it, turns out to be a moving tale of a sensitive and extremely intellectual girl's scarring experiences in her quest for identity. In *The Bell Jar*, men are presented as having vested interests. They want to ensure that women do not get empowered and thereby cut into their jobs, challenge their position of comfort in their family and take personal power away from them. Their intention seems to be that man's world does not get disturbed by determined women. What Plath presents is an institutionalized system of oppression in which man wields his power and strength. The closing image of Esther in proper outfit preparing herself for her final interview presents the protagonist merely in new uniform. It is not the image of a renewed identity, not signifying a triumph of the real self but merely an image of a subdued personality who has been forced to an acceptance of the conventionalities of society.

Nancy Friday speaks of the ambivalence between love on one side and hate, fear and envy on the other in a girl's relationship with the woman in whose image she is. "It is this essential ambivalence that characterizes the mother-daughter relationship more than any other relationship in human life" (2). The conflict between the mother and the daughter experiences fierce battles within and bear emotional and psychological scars from which the mothers are not able to shield them. This reality is being portrayed in *The Bell Jar*.

Mother-Daughter relationship is very commonly described in novels, because it is an idealized relationship. In reality, the mother does not always offer sacrificial love and the daughter seldom cherishes gratitude. In literature, the relationship has received special attention, as the feminists have focused their attention on it. Interest in the subject of women's experience as mothers and the unique relationship between mothers and daughters has increased. The mother plays a critical role in the development of her daughter. This relationship maintains the daughter's role play in their interpersonal relationships as well and the role women play in the society. The mother remains the identification object for the girl, not the boy. It is an intense and questioning relationship. It is a relationship between same gender persons. Thus, it is clear that the



mother-daughter relationship is unique and intense one that often determines the future development of the woman. The relationship between Mrs. Greenwood and Esther never comes into great conflict, but it is never resolved either. It has images of Esther and her mother gliding from one place to another in gray or black vehicles, without leaving and without arriving. Sylvia Plath takes up this motive in *The Bell Jar* by describing helplessness and pain both on the motherly and the daughterly side. Although Esther and her mother long for each other's love, they lose it at the same time and even start blaming each other in the end.

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**PRAGMATIC ANALYSIS: A STUDY OF JOHN GREEN'S
THE FAULT IN OUR STARS**

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Abstract

John Green is a recent popular name in the American young adult fiction. He is also an avid video blogger. *The Fault in Our Stars* is considered to be his outstanding by Green far along with other notables. This John research paper concentrates on the role of optimism in *The Fault in Our Stars* and the ways Hazel Grace and Augustus Waters make use of this idea in order to live a meaningful life against all the difficulties that they confront throughout the novel. The result of this study shows that how the characters deal with their cancer with optimism in Hazel Grace of John Green's *The Fault in Our Stars* novel. The effects on optimism on the psychological being of the characters have also been discussed in the research and the result of how optimism changed Hazel and Augustus' life for the better.

Key words: terminal illness, cancer, Hazel, Augustus, death.

Introduction

American literature is literature predominantly written or produced in English in the United States of America and its preceding colonies. American Literature was shaped by the history of the country that produced it. For almost a century and a half, America was merely a group of colonies scattered along the eastern seaboard of the North American continent- colonies from which a few hardy souls tentatively ventured westward. After successful rebellion against the motherland, America became the United States. Native Americans, the first inhabitants of the continent, did not develop anything we can call "literature".

Young Adult Literature is a genre that is separate from Children's Literature. It emerged in the twentieth century when teenagers became a powerful force of the economy in the 1930s and gained prominence in the sixties. In Reflection on Young Adult Literature, Scoop says:

To trace the history from the start, the mainstream of Young Adult Literature has been perceived as realism. Although the prototype for style and voice was J.D. Salinger's *The Catcher in the Rye* (1951), it was not until six

years later that the books promise began to be fulfilled. In the magic years of 1967-68, S.E. Hinton's *The Outsiders* (1967), Robert Lipsyte *The Contender* (1967), and Paul Zindel's *The Pigman* (1968), broke away from the saccharine formula of the junior novel to confront bold new subjects that soon earned such novels the name of The new realism. (11-12)

In *The Fault in Our Stars*, John Green tells the story of young love with no sense of futurity, no belief in a happily ever after. Green rejects the sentimental cliches that tend to structure cancer narratives, about the nobility of suffering and struggle, and the redemption that validates pain and loss. The result is a novel where love is inextricably bound up with fear, death, and merciless physical pain- but is still, somehow, worthwhile. The tone in *The Fault in Our Stars* is blunt. Both of them, Augustus and Hazel share their very honest, blunt feelings towards just aboPositivity is positive attitude in facing any problems in life. *The Fault in Our Stars* is a story about teenagers who suffer from cancer and they meet each other in the Support Group. They face many problems in life because the cancer is a deadly disease. Green focuses the positivity of facing cancer in this novel. The reasons of the characters who have cancer, increase their positivity in this novel are, they can meet another person which gives them some motivation. Another thing that makes them to be positive in facing cancer is that, they believe in God who gives them something that might have the positive power behind everything they are facing.

Green centers positivity as the major theme of the novel *The Fault in Our Stars*, because he wanted to show that by positivity, someone can get the good thinking of how to face his or her destiny. The characters show great courage and strength. Their cancer robbed them of their sight, but despite this they still kept their sense of humor and adapted their life to cope with their disability. Developing a positive attitude in them does not allow their mind to entertain any negative thoughts or doubts.

Hazel's perspective on life changes quite quickly. Throughout the book, Hazel was pessimistic and looked down on life and suffered from internal conflict with herself. She was not outgoing and preferred to stay at home rather than living her life and meeting new people because she had to learn to come to terms with accepting that she will die at a young age. Even when she joined the cancer supporting groups, it was her mother who forced her to do so. When she meets Augustus at the cancer supporting group, her view changes as August's positive and unique outlook on life influences her perspective on her situation.

Augustus slowly starts to get her to open up, allow people into her life. Through him, she even changed her own view on love and learned how to love. Because before she meets Augustus, she did not want to fall in love or to have an intimate relationship with anyone, as she felt she is like a grenade will explode in any moment and hurt the people she loves. Hazel used to be obsessed over the thought of what would happen to the people around her when she dies. But When Augustus’s cancer reappears, Hazel realizes that she is no longer the “grenade” in the relationship and anybody can be a grenade and that the relationship is worth it to be experienced rather living in fears of hurting people. therefore, she starts cherishing life and becomes grateful for the time they have left together.

Augustus taught her how to live in the moment and not to over think and be depressed of things that might not happen. This shows how Hazel has grown immensely towards the end of the story. The final words of Hazel at the end of the of the story shows how much Hazel grew spiritually throughout her journey. Once Augustus dies, she ends up writing a eulogy and, in the eulogy, she says “I do”. By “I do” she means that she does not regret choosing Augustus and being in a relationship with him even though she knew the relationship will not last long. She accepted and wanted to be in a spiritual marriage with Augustus. Though the marriage is symbolic, it is nevertheless real.

Hazel’s words “I do,” are significant in a few ways. For a start, they mark the first and only instance of Hazel using the present tense during her narration the novel. This change in tense is notable because it indicates that Hazel does not see Augustus’s death as an end to their love for one another. The idea ties into the fear Hazel talks about with her mother, whom Hazel once overheard lamenting that she wouldn’t be a mother anymore after Hazel died. Through these scenarios, the novel suggests our relationships don’t end with death. Just as Hazel’s mother reassures her that she’ll still be her mother even after Hazel dies, Hazel acknowledges with her words that her relationship with Augustus will continue despite his passing.

Hazel’s belief is that the universe is indifferent to human life and suffering, and this view feeds her with the thoughts on the meaning of existence and the possibility of an afterlife. As Hazel suggests to her father during their conversation, she doesn’t think that anything happens for a meaningful reason and that her consciousness persists in any way after death. Her father’s view, which he explains in the quotation, is much more open-ended. Because the universe seems predisposed to creating

consciousness, it appears to want to be observed. While this perspective doesn't go so far as to propose a god presiding over the universe, it does imply that the universe is in some way conscious of the life in it. It moreover says people don't have the information or specialist to say for certain that a person's awareness is temporary.

Hazel does not have a motivation and drive in living her life. That is exactly why she has a pessimistic character and a negative view on life. Yet, after meeting Augustus Waters her life drastically changes and she has a new spirit to live her life meaningfully. It can be seen through her statement about the quote in Augustus' home. There's a great quote in Gus's house, one that both he and I found very comforting: Without pain, we couldn't know joy. "I went on spouting bullshit Encouragements as Gus's parent, arm in arm, hugged each other and nodded at every word. Funerals, I had decided, are for the living." (272-273).

From the statement above, it shows that Hazel Grace received the positive result from the quote and also Augustus' parents. After seeing the quote above, she feels like she is alive. She uses the quote to give her such a way to her to be brave and enthusiastic in living her life fully. Before seeing the quote in Augustus' house, Hazel was a pessimistic person. Yet this characteristic is changed due to external influence that is to follow the quotes in Augustus' house. Therefore, it affirms that she has an external motivation. Furthermore, that quote in Gus' house makes it clear to Hazel that in order to know the value of something in life, one has to see the opposite side of it. In other words, if one cannot know the pain and suffering of this life, they cannot truly see the blessings of joy in their life.

In the earlier part of the story, Hazel Grace is a girl whose life has very little drive. But she still ends up finding a positive light in her dark days. At the beginning of the novel, Hazel Grace thinks bitterly about the world. That there was a deeper negative meaning for everything. After meeting Augustus Waters, she sees the value of life in a positive way. She tries to live her life happily. She avoids her pain and tries to look stronger. It is because she did not want to make people whom she loved feel sad and cry because of her.

The book *The Imperial Affliction* gives her motivation to stay healthy and not thinking about her death, so that she has a power and energy to think positively about her condition. Because if her condition is good and her illness can be better than before, she admitted to travel to Amsterdam in order to meet the author of the book Peter Van Houten and to know the ending story, so that the spirit of Hazel Grace grow

up because she thinks that she can reach her dream soon. The book gives her motivation and also it is the proof of an extrinsic motivation because the book is triggering factor of her to put a wish to be fulfilled and cherish life to make sure that she was the chance to fulfill the wish.

Augustus Waters gets the motivation from his family. His parents hang several motivational quotes in their house. Augustus Waters feels like he has a high spirit and encourages him in living his life fully. Because of living in the middle of an optimistic family, he is influenced to maintain the optimism to himself. It can be seen through the conversation between Augustus and Hazel Grace. Augustus Waters has received motivation from his parents, but also see that he has grown up in a family who has highest spirit towards life. This is one of the reasons that no wonder he is accustomed to living his life with bliss and high character. Ultimately, repeated reinforcements of positive attitudes from his parents mentioned before are motives for his valid optimism.

Augustus is a caring and optimistic person. He has a high drive to perform his activities even though he has cancer. He still cherishes his life and tries to do everything in order to leave some marks after his death. One of the main drives of his is to make his girlfriend Hazel feel happy and comfortable because he feels deeply in love with her. This is evident in Augustus' statement when he says "I'll fight it. I'll fight it for you. Don't you worry about me, Hazel Grace. I'm okay. I'll find a way to hang around and annoy you for a long time" (216). It shows that Augustus source of motivation is Hazel.

Augustus wants to fight it all because of her. He also does not care if he has his illness. He just thinks about Hazel and always wants to be with her, because he has found her as a blessing in his life. Since Augustus loves Hazel, he feels that they belong to each other. Much like Hazel, being aware of their limited time on earth, they both want to share their feeling of love and belonging to each other. As a result, Augustus continuously pushes beyond his pain and suffering to make sure that his loving soulmate is comfortable and contented of his existence and fulfills her need of love and sense of belonging.

Optimism is a mental attitude that is characterized by hope and faith in success and a positive future. Optimists are those that expect positive things to happen, where negative results are expected by pessimists instead. A variety of advantages are linked to positive attitudes, including improved coping skills, lower levels of stress, better physical health, and higher determination while achieving goals. Also, hardships tend

to be seen by optimists as learning opportunities or temporary setbacks. For them, even the most miserable day holds the hope that "tomorrow will probably be better."

Optimism is associated with positive outcomes in one's life in general, possibly as a result of processes that promote and maintain Psychological Well-being. There is significant positive correlation between optimism and psychological well-being and there is insignificant difference between male and female adolescents on experiencing optimism and its effect on their psychological well-being. Ultimately, optimists are more likely than pessimists to engage in positive health practices. One of the obvious characters that exercises optimism in the novel is Hazel Grace. Hazel remains an optimist despite having in a deadly illness which is lung cancer. No matter how much pain she goes through, she chooses to ignore the pain. Despite the realization that she is hurt, Hazel has found optimism as a coping mechanism to deal with her cancer. As it is evident in her constant acting that everything about her is fine.

Hazel suffers an incurable cancer that will undeniably lead her to her end, Hazel wants to believe, and wants others to believe, that she can bear that pain and that she is just fine. By saying that she is fine, Hazel denies that she is sick and wants to enjoy her limited time on earth with her loved ones. She chooses to see the bright side and to lead others on the same path. After choosing to be an optimist, not only she started to see her own life through a more positive scope, but she also started loving and appreciate her parents that always give the encouragement vibes through her illness and it can be seen from her thought, "I wanted to make my parents happy" (8). From the previous statement, it shows that Hazel loved her parents so much. She did not want to make them feel sad and hurt their feelings. All that she wanted is to make her parents feel happy and blessed with the existence of Hazel Grace. The effect of being an optimistic character on her psychology can be seen throughout the novel.

Augustus is probably the most optimistic character in the novel. Augustus never gives up on anything. he is living his life gratefully, as a result he always built up his spirit for himself and also to others. always tries to make himself feel courageous. Augustus Waters actually has high enthusiastic nature. he always tells other people, especially his friends that he is fine and always fine. he is living his life with full of positive reinforcement and he wants to show other people that he is strong enough to face his life even though he is sick. this energy can be related to his characteristics as an optimistic person. He is optimistic about his health condition even though he has suffered a lot of diseases, including the one that is life-threatening and

permanent(osteosarcoma). Because of that, he does not let his disease affect his happiness.

Motivations of the characters play an important role in their life to be alive. In other words, both characters had similar determinants that kept them going forward and made their life easier in order to reach their goal. Besides that, the effect of family and friends is apparent in the novel. Thus, characters rely on each other's strengths, family and friends' support, and optimism.

In conclusion, the research can be helpful for those who are having tough times in their lives. Also, it indicates a message and points that no matter what it is that one is going through in their lives, it is never a solution to give in to their agony and misery just as Augustus kept his optimistic behavior to inspire others. Another lesson that the research gives is that happiness and a meaningful life will not knock on your door, but you have to work for it. Ultimately, this research can motivate the readers to go through the difficult times that they might encounter during their lives and to help them focus on the bright side of life and think in an optimistic manner so that this gives them the strength to overcome their shortfalls, sufferings and ut anything. From the beginning, Augustus shares his fear for oblivion.

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**THE METAPHYSICAL ISOLATION OF DISABLED INDIVIDUALS:
A STUDY OF CARSON MCCULLERS' THE HEART IS A LONELY
HUNTER**

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Abstract

The novel *The Heart is a Lonely Hunter* from American Literature portrays the characters who suffer from loneliness due to the ignorance of friends, family, and society. They isolate themselves to overcome their loneliness and also find people with whom they can share their feelings. Loneliness and Spiritual Isolation has been the main topic of the works of the Southern American writer Carson McCullers. Her superb literary creation lies in that she integrates the theme of loneliness between the lines of her works and strongly echoes and deepens that theme by use of brilliant narrative skills. This paper points out that McCullers; a portrayal of characters from many aspects, and also deeply reflects the internal perplexity and solitary state of mind of those people living in the American South after the Civil war. It also depicts the steps to overcome loneliness from mentally sick, death etc. and distinguishes the differences between and Social Isolation.

Keywords: Loneliness, Isolation, Social Isolation, Physical Isolation, Emotional Isolation, Sigmund Freud's theory

Introduction

Carson McCullers was born on 19th February, 1917, in Columbus, Georgia. Her original name is Lula Carson Smith. She is an American writer of novels and stories that depict the inner lives of lonely people. In 1937 she married Reeves McCullers, a writer whom she had met in Georgia and with whom she was to have a long and complicated relationship at the age of twenty. Her life after that was darkened by pain, illness, and disaster. And by the age of twenty-three, she had completed her first novel, *The Heart is a Lonely Hunter*. Shortly after it was published in 1940, she became New York's new literary star. McCullers successfully generalises the state of metaphysical isolation as an eternal human condition. Her first novel, *The Heart is a Lonely*

Hunter, in 1940, has Mick Kelly as its child character, who is attached to John Singer, the deaf-mute, who, she, fancies, understands and sympathises with her difficulties.

Over the course of the novel, McCullers paints a portrait of the theme of Loneliness look like from different angles; spiritual, psychological, ideological, racial, and existential. As Mick Kelly, Jake Blount, Biff Brannon, and Doctor Benedict Mady Copeland individually seek companionship and validation from John Singer, they never realize or even stop to consider the fact that they are not alone in their feelings of remoteness and seclusion. John Singer is perhaps the most lonely and isolated character in the novel. Though he is the central character, he is also a great mystery. Unable to communicate with those around him very easily. Loneliness is the only thing that bonds these very different characters together. McCullers suggests that their loneliness is a kind of gift: it binds these four individuals' fates giving them the opportunity to find the connections for which they're so desperately searching.

These four individuals are ships passing in the night, too obsessed with their own sadness and isolation to realize that there are other people, right there in their community, looking for friendship, help, and solidarity. McCullers uses dramatic irony to highlight the unnecessary suffering of her characters, suggesting that, perhaps, if they were to open themselves up to broader friendships, their loneliness might be diminished. At the same time, however, there exists an undercurrent of cynicism and even defeat within the book. McCullers' characters all end up just as lonely, if not even lonelier than they were at its start. They have failed to recognize the fact; they are unable to use it to bond with those around them.

McCullers argues, ironically unable to see that the feeling which plagues them and makes them feel so isolated from those around them is actually the force bonding them, unknowingly to others. Loneliness is located in the individual and how they feel. It explains why loneliness can be experienced within a crowd and that being alone does not necessarily mean being lonely. Social loneliness is the absence of a network of friends, family or friends or community. Emotional loneliness on the other hand is the lack of a confidante or a trusting, loving relationship, even within a good social

network. Another type of loneliness, though probably less common, is existential loneliness. These types of loneliness are not mutually exclusive. They are likely to overlap and be experienced to different extents at different times. More significant emotional loss tends to correlate with feelings of anxiety.

As protection against harmful thoughts, isolation prevents the self from allowing this discernment to become repeated and possibly damaging to the self-concept. Being alone may leave older adults more vulnerable to loneliness and social isolation, which can affect their health and well-being. John seems to be very mute to others, despite his longing for communication. The only person with whom he communicates is his mute friend Antonapoulos. He is deeply attached to him other than anyone else. He used to share with him his feelings, but after he leaves, John becomes a loner. However, the characters in the novel seek solace from him for getting relief from their problems. Despite his loneliness, he provides a sense of relief to others, unknowingly.

The theme of loneliness is evident throughout the novel. Singer never changes to express his feelings to anyone. Even after meeting new acquaintances after his best friend's death, he lives in loneliness. This lack of communication in John makes his life a lonely tragedy. Each of the five main characters in *The Heart is a Lonely Hunter*, strives to break out of his or her isolated existence. The reasons for each character's loneliness are very different. All five, with exception of Biff, confide in Singer the things that make them spiritually lonesome. Though it is never made clear, the only reason Biff does not discuss his conflicts. Biff still finds Singer's presence comforting. After talking to Singer, the characters almost always feel soothed.

Those experiencing loneliness will vary in their social cognition compared to those who are not lonely. They may have a greater fear of rejection, being a burden or a distrust of other people. We may choose to be alone and live happily without much contact with other people, while others may find this is a lonely experience. This is important as depression is the most common mental health problem in later life. The loss of a partner, family member, or friend, can evoke a range of distressing emotions Bereavement is one of the principal risk factors for loneliness. Support for bereavement plays a key role in tackling loneliness.

Isolation undergone by each character in *The Heart is a Lonely Hunter* is a combination of personal and environmental factors. However, all of the characters feel intensely alone in some sense or another, and all of them desperately need to communicate their feelings with somebody who understands them. Throughout the novel, McCullers introduces the reader to four extremely complex and interesting characters battling with the isolation and struggles they face. It is almost as if he is a mere diary to them; he listens, and they share everything. Despite his sense of isolation, the characters use him as a mechanism to battle their remoteness.

Mick is lonely and bored possessed with music. She is a young girl who is struggling with finding herself. She uses music as her escape and uses it to battle the isolation she faces, along with her confidant John Singer. Jake Blount is wrestling with social isolation brought on by his frequent drunkenness and resultant bad reputation but he also feels a deeper kind of loneliness. Biff does not discuss his personal conflicts with Singer, most likely because Biff himself is unable to articulate these personal conflicts. Biff Brannon longs for children and a family, but after his wife Alice dies, he finds himself unsure of whether he'll ever be able to give the love he has in his heart to another person. Regardless, Biff still finds Singer's presence comforting. After talking to Singer, the characters almost always feel comfortable. Doctor Copeland finds himself feeling isolated from his community and his family. He is both ideological and socially isolated and has strained relationships with most of his children. McCullers's big point here is that everyone faces isolation and must learn to make peace with his or her unique personality.

According to Sigmund Freud, in psychoanalytic theory, Isolation is repression in which the individual screens out painful feelings by recalling a disturbing or painful event without experiencing the emotion associated with it. For people of all ages, social connection is vital to survival. They're hardwired to depend on one another for support. When they don't get the connection they need, they're sadder, sicker, and more at risk of early death. As Singer longs for the love from Antonopoulos an unkind man, he is depressed and goes to visit him during the assault, and after hearing the news that Antonopoulos has died, Singer commits suicide himself due to his depression that he is left alone.

Isolation is a defence mechanism in psychoanalytic theory first proposed by Sigmund Freud. His theory stated that by inserting an interval the person was “letting it be understood symbolically that he will not allow his thoughts about that impression or activity to come into associative contact with other thoughts.” As a defence against harmful thoughts, isolation prevents the self from allowing these cognitions to become recurrent and possibly damaging to the self-concept.

Social isolation is intentionally distinguished from loneliness. Loneliness and isolation do not always coexist. Socially isolated persons can experience intense feelings of loneliness, but not all socially isolated people experience such feelings. Likewise, one can be lonely without being socially isolated. Social isolation takes two forms; Socially isolated by choice, and feeling socially isolated. Many people of all ages live alone and are socially isolated. When we have little or no contact with other people for extended periods and we start missing having more people around us, we are feeling socially isolated.

Physically isolated people often can have ways of communicating with other people through telephone or using the internet, and can sometimes still get visitors, like the characters in the novel *The Heart is a Lonely Hunter*, Mick Kelly, Jake Blount, Biff Brannon meet Singer and communicate with them about their life events and how they are isolated. John Singer visits his friend Antonapoulos to communicate with him. The extent of our well-being depends on the circumstances of our physical isolation.

Physical isolation can create social isolation, emotional isolation, or loneliness. Physical isolation takes two forms; Physically isolated and satisfied, and physically isolated not by choice. Many people of all ages live alone and are physically isolated. . Change happening to people they know could start them worrying about how many contacts they will have and the fear of not being able to visit heightens their awareness of being alone, such as John Singer is afraid to lose his friend Antonapoulos, worrying that he can't have contact with him like before. This made Singer feel physically isolated.

Social isolation is when they do not interact socially with others, like the characters in the novel, but feel comfortable interacting only with John Singer. People of all ages are hardwired to depend on one another for support.

When they don't get the connection they need, they're sadder, sicker, and more at risk of early death. As Singer gets sad when he doesn't get the proper connection with his friend Antonapoulos and also dies of depression after hearing the news of his friend's death. This lack of connection is more common than many people realise. Social isolation can affect nearly every aspect of your mental health as Jake Blount in the novel.

Emotional isolation occurs when someone is unable or unwilling to share their emotions with others, as the character John Singer in *The Heart is a Lonely Hunter* is not able to share his feelings with any of the other characters especially his close friend Antonapoulos, Emotional isolation can act as a defence mechanism to protect a person from distress. Someone in an intimate relationship can also feel emotional isolation. One or both partners may feel alone within the relationship, rather than supported or fulfilled, as Alice feels isolated because of her husband Biff Brannon in the novel and he too feels isolated because Alice doesn't leave him near her.

Men tend to be more isolated than women as the characters John Singer, Jake Blount, and Doctor Copeland feel isolated in the novel *The Heart is a Lonely Hunter*. Despite this isolation, men are less likely to admit to feeling lonely. Social media promises to help users feel more connected. It doesn't mean that social media use is always harmful or that all people who use social media feel isolated. For some people, social media offers access to a sense of community and belonging. This can be especially true for marginalised individuals who might have trouble connecting with people in their physical location. Social media may be a loneliness factor when it replaces in-person connections. Social media is just one form of interaction, or when it increases access to meaningful relationships, it may reduce isolation.

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RECLAIMING IDENTITY: A STUDY OF TONI MORRISON'S *SONG OF SOLOMON*

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Abstract

The Nobel laureate and Pulitzer Prize-winning author, Toni Morrison, was a giant in the history of literary sphere. Her novels were one of a kind and her influence extended well beyond her words written in her books. Morrison's mesmerizing and bold novels about black history and identity crisis helped many other authors to venture into his forbidden world with a straightforward gait. Morrison's novels scream about the advance issues of civil rights and racial justice. In Morrison's writing, there is a constant attempt at glorifying the collective past of African Americans toward a manifestation of personal and cultural identity. She wants to pinpoint the fact that it is only through the past that people could feel 'oneness' with each other. It is only their ancestral experiences that could unite them; that could bind them all to their common roots within the African heritage flavoured by the African-American experience in America. In the novel *Song of Solomon*, young black Milkman was interested in understanding his ancestor's past and was keen to know more about the legend of the flying slaves who were able to go back to Africa.

Keywords: Identity, Gold, *Song of Solomon*, Ancestor's History, Milkman's Journey

Introduction

Toni Morrison's writings one comes to definite turning point in the history of Black women's literature. Toni Morrison's works are fantastic earthy realism. They are deeply rooted in history and mythology. Her work resonates with mixture of pleasure and pain, wonder and horror. Primal in their essence, her characters come out with force and beauty of the gushing water, seemingly fantastic but as basic the earth they stand on. they erupt, out of the world, sometimes gently often with force and terror. Her work is sensuality combined with an intrigue that only a piercing intellect could create.

Her novels are known for their epic themes, exquisite language and richly detailed African American characters who are central in their narrative. Morrison is keenly aware of her potential influence in the generations of African Americans. She occupies a central place in 20th century. Her epic themes and characters, her unique and sophisticated style of storytelling, and her ability to recreate urgent, long silenced voices have expanded about the complex, often confusing relationships between race and gender in contemporary society her main concern is to define the beauty and brutality of human condition and evoke the pathos and tragedy of human life.

Toni Morrison's male characters betray, more than her women characters do, which is the impact of racism. Castrated, stymied, emasculated and psychically fragmented, her men are for the most part grotesque. Women have endured better the dispossession and disenfranchisement that are woven into generations of slave history. The degeneration of the male began with slavery, an individual and a collective tragedy. Women, as breeders of a work force, enjoyed relative importance, but men were fathers merely in name. In more recent times, women found a means of livelihood in menial jobs, but men found the life of denied opportunities and deferred hopes unbearable. Powerless to find easy solutions to the insurmountable problems of life, men sought refuge in regression, the oblivion of drugs and alcohol, aggression and sadism, narcissism and acquisitiveness as survival strategies to preserve their fragile identities.

In contrast to her earlier works, *Song of Solomon* encompasses a wide variety of black communities across America, from the liberal Midwest to the old-fashioned and somewhat conservative South. It is a novel that arouses consciousness in the face of an African American struggle of confinement into a life of possibility. *Song of Solomon* is also Morrison's first novel to be written through a male protagonist view, and the narrator's extraordinary manner of weaving in and out creates an even more spellbound lure into the novel's plot. This technique follows in part from the author's interest in folk storytelling traditions; Morrison patterns the novel after a Yoruba folktale about African-born slaves who could fly back to Africa whenever they wanted. Morrison alludes to other ancient storytelling and folk-art traditions as well. The title itself comes from the Song of Songs (or *Song of Solomon*) in the Old

Testament, a rhapsodic love poem consisting of addresses between a lover and a beloved. The lyrics of the *Song of Solomon* as presented in the novel are a variant of a Gullah folktale, further emphasizing the importance of oral tradition. Interestingly, Morrison may have taken this interest in roots and history even further with the name of Solomon, as that was the name of her own grandfather, a former slave.

Song of Solomon, a rich and empowering novel published in 1977 that focuses on black life across America, follows the path of Milkman Dead, a young black male in search for his identity. Toni Morrison's gift of storytelling clearly shines through her poignant writing, as she presents Dead's search for his culture and history, impeded by the society he lives in. *Song of Solomon* not only focuses on African American community life, it is also a stark depicter of everyday white oppression. The novel earned Toni Morrison a National Book Critics Circle Award and an American Academy and Institute of Arts and Letters Award.

Her third novel *Song of Solomon* was hailed by critics as a major literary achievement. It was based on an African American folktale about slaves who can fly back to Africa when they choose. Morrison fictionalises this folktale through the character of Solomon who is the great grandfather of Milkman Dead. It tells a story of a character named Milkman Dead, who is search for his families lost fortune discovers instead his family history. The novel is at once a romance of self -discovering, a retelling of the black experience in America that uncovers the inalienable poetry of that experience and a family saga a luminous in its depth and universality.

In *Song of Solomon*, therefore, Morrison debunks one myth and creates another. Born in the North, and heir to the material advantages that generations of blacks identified with that territory, Milkman Dead must find meaning for his life by reversing the pattern, by going south, back into the territory of his ancestors. There must also be a reversal in his expectations on that soil. Initially, he goes searching for gold, as many generations of blacks came north in hopes of improving their material wealth. But the South is not the land of riches, of physical, tangible goods waiting for those seeking their fortunes. It is the land of blood and death, of slavery, of countless generations of Africans tied to brutal and unrewarding labour, of intangible instead of tangible wealth.

Milkman ultimately returns to the South for things that he can carry away only in his mind, in his conception of self, in his contentment with communal and familial history, and in his satisfaction with knowing and being who he is.

Milkman's journey is one that works because he forges out of it a blueprint for knowing himself. By going against the traditional archetypal movement and structuring a more personally rewarding one, Milkman earns our respect as he discovers his identity. Though his journey may share certain features with some of the mythological quests, it is nevertheless more distinctive than imitative.

Milkman's major problem is that he has been too complacent in his northern, middle-class existence, far removed from the stock of black people in the South who were tied to his ancestors who moved north. In order for Milkman to appreciate those roots, to become receptive to his past, he must be stripped of external symbols of separation. His city ways and attitudes have to change; Morrison effects the change by showing their uselessness on southern soil. Milkman undergoes a devolution from which he can be reborn as a sensitive human being. The stripping process begins with his arrival in Danville, Pennsylvania, where he hopes to find leads on where Pilate has left the gold. His emotions, clothing, accessories, and manners are all signs of the distance between him and the people whose help he needs.

Emotional readjustment signals the onset of many changes. For the first time he is put in the position of trying "to make a pleasant impression on a stranger" (229) when he goes to Reverend Cooper's house asking about Circe. That slight discomfiture gives way to tale swapping when Milkman discovers that Cooper has known his father, yet it is nonetheless a prediction of the adjustments Milkman will have to make on his journey.

His trip to Circe's house and to the cave induce physical discomfiture to match the earlier emotional one; the literal stripping process begins. His city hat gets ripped off by tree branches. He must take off his shoes and socks in crossing the stream to the cave, and his bare feet are "unprepared for the coldness of the water and the slimy stones at the bottom" (249). He soaks his fancy pants and cigarettes, and breaks the "gold Longines" watch his mother had given him: "the face was splintered and the minute hand was bent" (250). His fancy shirt becomes soaked with sweat, as does his face, for which he uses

his tie as a handkerchief. Upon discovering no gold in the cave, he screams in anger, and the bats in the cave startle him into a run, “whereupon the sole of his right shoe split away from the soft cordovan leather” (252). He uses his tie to strap the shoe together and lashes his way through branches and weeds back to the stream and the highway where he has been scheduled for a pickup. His watch now gone, he can only gauge by the sun that his ride has probably come and gone.

Milkman’s sojourn in the wilderness of Danville has been difficult for him emotionally and physically, almost as if the very environment thwarts the unhealthy motives, he has in looking for the gold. At this stage, the journey backfires more than it move forward. Yet Milkman discovers some things in the process. He knows that the gold is no longer in the cave, and he surmises that Pilate had probably returned with it to her ancestral home in Virginia. Though he moves in that direction without a clear sense of where he is going or a significantly altered psyche, his willingness to continue the journey is itself noteworthy, for he has at least not been deterred by the obstacles he has encountered. They are mere preludes to what he must overcome the closer he gets to the object of his quest.

Milkman Dead’s search of his roots. He undertakes a long and strenuous journey from North to South searching for the gold that his father and aunt hid in the grotto in the South. He departs from Detroit Ghetto and reaches his destination, Shalimar, a village in West Virginia passing through Danville, Pennsylvania where his father grew up. He travels from his parent’s house, which is prosperous with material property, in the industrial North, to his ancestor’s humble house marked by its agrarian culture. He navigates physically and spiritually to the history of his ancestors where he temporarily rests to feed his mind from its affluent assets establish his identity.

His experience in the Shalimar Hunt indicates the great transformation in his character. It helps his consciousness to rise to its crest. His awakened consciousness regarding race oppression and class exploitation paves the way for the sprouting of his consciousness regarding gender. During the early stages of his life women receive variegated forms of ill treatment from him. For instance, he pisses on Lena, shrieks at first Corinthians, and spies on Ruth, robs Pilate and kills Hagar. This vicious treatment, which he has meted out to

women who had served his welfare, signifies his lack of gender consciousness, his crippled view of women is totally changed.

With self-awakening he comes to value the great assistance he had received from women like Pilate and Hagar. He begins to respect women and the poor blacks. His new attitude entails his renunciation of the commodified way of life. He begins to embrace the feminist trend that called for equal rights for men and women. Man's subsistence is concomitant with their counterparts, and the converse of it is also true. They are tied by a reciprocal kind of bond. His vision of women is radically changed. He develops parity as his new attitude towards men and women. His former biased view of women is buried forever. He develops a reciprocal relationship with a woman. Morrison presents a situation from which one can easily discern his gender awareness. He guides Pilate to Shalimar to inter her father's bones. The reciprocity is manifested through Pilate's guidance to bury the dead in him and Milkman's direction of Pilate to bury her father's carcass. He becomes a source of life and acts as a catalyst for women.

Milkman's thirst to drink his ancestor's history is saturated by Reverend Cooper, Circe and other old men who remember the Two Macon Dead's and express great reverence for them. Reverend Cooper, his father's childhood friend tells him that he knows the whereabouts of his ancestors. These words thrill Milkman because it affords him an opportunity to know about his family's past. At this juncture, his consciousness rises to a higher level regarding racial oppression. They make a feast and drinking party in honor of Milkman. This is the first time that Milkman basks in the glorious history of his ancestors and feels a great sense of euphoria. When he listens to Shalimar's children's song, he realizes that it resembles the song sung by Pilate. He learns about critical epochs that had a grave impact on blacks like the Civil War, the Reconstruction period and the Great Migration.

During his journey, Milkman overcomes many impediments that obstruct his trip. He successfully enters into Pilate's house which is characterized to be a place filled with darkness as it had a sack of gold which was robbed from someone. Likewise, he goes through a greenish black tunnel to reach the Butler's mansion to meet Circe. He overcomes the mortifying minor mishaps of his track to the cave. Finally, he enters the cave that is

inhabited by bats. He is physically bruised and exhausted by troubles he encountered in the woods he survives the knife and broken bottle fight in Shalimar. His arrogant demeanor, which disparages and vilifies black people, and his vulgar flaunt of wealth instigates them to challenge him to fight outside the general store. He sorts Guitar's attempt on his life. He participates in the hunting expedition of bobcat with King Walter's elders. When the hunting expedition ends the hunter gives Milkman the lion's share, the heart of the animal, to show that they have accepted him as a member of the community. When he leaves the party, he feels his psyche is moulded by his adventurous decision and action he adopts.

Milkman's resort to the act of introspection and contemplation enables him to discover his true self which is marked by high confidence. The emanation of his self is patiently seen from the change in his character, which epitomizes his emerging awareness. He stops limping anymore, which indicated his emerging identity. He develops rapport with human beings, animals and trees, which alleviate the pain of his loneliness in the woods. Traversing hinderance, he encounters in his journey makes him an archetypal hero.

The discovery of his great-grandfather Solomon's ability to fly provides him with joy and exhilaration because he sees in it materialization of his childhood dream. Becomes so happy that he thinks he need a wide sea to bathe him. The image of the vast sea demanded by him can be constructed as indication of his desire to cleanse himself from the impurities that colored his formal life. While he was wandering, a thought floats in his mind, which instigates him to remember Ryna Gluch and the voice of carrying woman. Automatically he makes a connection between Hagger whom he has left behind when he flies back to Africa. Both the woman dies desolately as their hearts are broken by the departure of their men. At this juncture he realizes that he is the cause of Hagger's death because of his manic preoccupation with flying makes him to leave behind causing her to meet her tragic end to die in forlorn condition. He acknowledges his responsibility for her death and his willingness to receive just punishment.

He vacillates between a strong craving to fly and his reluctance to emulate Solomon's model. Pilate helps his psyche from dithering by telling

him that there are other ways of flying. While interring the bones of Pilate's father, Pilate is killed by a bullet shot from Guitar's gun that targets Milkman. Suddenly a bird swoops down and takes Pilate's earring. Symbolically speaking, Pilate's souls soar high without leaving the ground. In her dying moments Pilate asks Milkman to sing and he sings the song of his ancestors. He realizes why he loves her without leaving the ground, he has learnt from her that one can't fly on off and leave the body. He emulates her model not Solomon's.

He benefits from his flight in the form of some quirks, which radically change his vision of life. He gets rid of his overwhelming fear of death that deters his quest for self. Pilate's death in his arms stifles his fear of death and implants a strong sense of his willingness to accept death. He also learns love from Pilate's words on her dying day. He embraces Pilate's role and becomes a guiding spirit for others. He asks Guitar to renounce hatred as it destroys and consumes its bearer. He exerts his efforts to wear him away from violence.

Juxtaposing his earlier life marked by narcissism with his acquired one growing out of his retrospective act, he realizes that the bad feelings he had received from other such as Guitar hatred and Hagar's vengeance are attributed to some foibles in his own personality and that they are not culprits. He realizes his previous relationship with others was based on the attitude to enjoy his life with people who share their happiness alone. He eschews his abnegation of responsibility for the suffering of others. He belatedly realizes that he is to blame for Hagar's tragic death. He decides to carry with him Hagar's box of hair which symbolizes his new awareness of the past. His act can be constructed as an act of expiation and repentance for his past. He atones for the severe hurts he had inflicted on the psyches of others particularly of women. He feels a sudden rush of affection from the people who scarified themselves for his sake. Of course, Milkman rises to his awareness when he comes to the stage of outgrowing his vanity, self-veneration and the feeling of apathy for others.

In sum, Milkman commences his life with a very low level of awareness about the triptych of race, class and gender. Such ignorance leads to an absence of self-awareness, which deters his journey towards his identity. His self-realization is hampered by his embrace of the materialistic and

acquisitive philosophy that he imbibed from his father. When he gives up money-oriented thinking, his conscience rise to a higher level and beings to commingle with African masses. His biased view of women is totally changed; this prompts him to develop an equalitarian and humanistic view of man and women. All these together pave the way towards the recovery of his true self. Interestingly as individual, he overcomes the impediments he encounters in his trip and succeeds in constructing his distinct identity. His journey is crowned with the sprouting of his spiritual identity, connecting him to the past incorporating him to present, and peeking him to the pinnacle of self-discovery. Milkman succeeds in navigating the perilous sea and reaches his destination.

By the end of the journey and after, it is easy to see an axiomatic metamorphosis that colours his character and mould his psyche, leading him to the realization which gives a glimmer of hope to blacks, that one day they would absolve their collective soul from the incapacitating and debilitating forces which maim and thwart their collective identity. He eliminates his egoistic vision of life and implants altruism and philanthropy that is based on accepting the rights of others. He breaks free from the avid materialism that seduced and enslaved him. He identifies his own foibles and expiates for his sins. Ultimately, he emerges as a triumphant hero who traces the genesis of his rich history and culture and succeeds in identifying with the community spiritually and physically. He bathes his soul in the glorious history and agrarian culture of his ancestors, which Morrison embalms in mystery. He learns to fly without even leaving the ground. He establishes his identity and find meaning in life. So, his journey is successful at all levels through he is deterred by variegated impediments. He emerges as a totally changed a man, a New Milkman.

Milkman's journey that Morrison charts is a reversal. Generally, African-American do migrate from the South to the North to avoid segregation and lynching. But here Milkman's Journey from the North to the South itself imparts the importance of his past in his life. In a community where most of the past generations were illiterate, songs rather than history books tell the story of the past. Morrison has presented the world of African American family and its surroundings. In her view, if African Americans have to

survive in America, then they have to unite themselves. They have to fight against racism unitedly. With the help of Milkman's character, she appeals the African Americans to leave the economic barrier and rouses their feelings to get rights. Morrison's appeal to the whole African American community and plea them to know their identity. She does so because she wants to prevail their own culture. It is not that she wants to make fun of white people but at times she also raises voice against Black middle class which did not want to help poor African Americans. In her view, one should not feel ashamed of his/her belonging and he/she should acknowledge it publicly. Morrison gives her message through Milkman's words: "If you surrender to the air, you can ride it" (337).

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COURAGE AND RESPONSIBILITY IN MADELINE L'ENGLE'S A WRINKLE IN TIME

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Abstract

Courage and responsibility shows the empower to lead in a right path with the help of good thing. In this a female protagonist has lack of courage. She has inferiority complex about her complexion and realises inner beauty shines brighter than outer appearance. For rescue of her father and brother she builds courage and responsibility. With the tool of love she rescue her family from evil thing.

Madeline L'Engle (1918-2007) was an American writer of fiction, non-fiction, poetry and interest in modern science. Her novel *A Wrinkle in Time*, took 26 publisher rejection and print in 1962. The religious wariness likely also contributed to some publisher's rejection of the book, but it didn't stop *A Wrinkle in Time* from being popular for more than 50 years after it finally saw the light. The book was an instant hit, winning the Newbery Medal in the following year.

Science fiction deals with science, technologies futurism, space travel, and exploration. It is considered as a stand-alone genre. It includes authors imaginative creation with science ideas, theories, prediction, and conjecture. *A Wrinkle in Time* is a science fiction build a story around existing scientific knowledge or theory. Unlike fantasy, science fiction attempts to present real scientific possibilities, even when they are highly unlikely. Some of the science fiction elements are: The characters travel through space and time, visiting distant planets and encountering different life forms.

A Wrinkle in Time is a depiction of young Madeline that has the same nature as the main female character in this novel. The author often compares herself to a female protagonist, Meg Murry, in her childhood, felt that she was always awkward, dishevelled, and out of place. Meg is now considered one of the greatest female protagonists in science fiction.

Madeline L'Engle sets up dimension in *A Wrinkle in Time*. In this book, Meg's brother Charles Wallace explains that the first dimension is a line. The second dimension is a square. The third dimension is a cube. The fourth dimension is time. And that brings us to the fifth-dimension tesseract. Mr. Murry is a brilliant physicist who studies space-time travel. His experiment causes him to 'tesser' or take a shortcut through space. He knew about tessering and was working on a way for humans to tesser. His research led to him getting trapped on Camazotz.

Meg Murry was a protagonist of *A Wrinkle in Time*. She lives in family's large farm house. She is worried about her performance in school. She is more concerned about her father. Her father has been missing for over a year. Then she visited an old woman named Mrs Whatsit, friend of Charles Wallace. She says about tesseract. The next morning Meg asks her mother what a tesseract is. Mrs. Murry distracted the topic. Meg was distracted in school so her principal warns Meg her father might not come home.

Meg was very good at judging her mother's perfection but it was difficult to judge her perfection. She thought that the perfection of others must become her own too. It is seen in the monologue that Meg greatly admired her mother's physical perfection and never acknowledged her strengths. It can be concluded that Meg needs someone or a situation that can provoke her to start thinking about her own perfection, which could be someone else's imperfection. Having a family with brain, beauty, and good social status are not always profitable. There are so many pressures to deal with. People will deliberately ask for more achievement from kids because they must have done something bigger than their parents. That is the law and they must do. Meg seems too overthink about that, she still wondering why she was born like this not as pretty as her mom. From this simple question will grow a big mindset that she is different from her parents and never ever achieve something as big as their parent have done whereas she could do anything beyond. She just has not realized that and kept burying her soul in a wrong mindset.

Being someone different is not a difference but a uniqueness. Being ugly and stupid is not a disgrace but evil is what makes someone different. A good person will always be loved even though she is not smart because people concerned with comfort in socializing rather than intelligence because these

circumstances will make someone more competitive in relationships while a relationship is based on mutual attraction. Meg seems to be one of those people who lack that understanding because she still compares herself to her mom.

Meg says that she pretended to be someone else so that she was considered the same as the others and it didn't seem to work. The situation will get worse if Meg does not try to open up to consult or just talk to her parents. In this situation seems that the need for confidence in Meg has not been fulfilled. Meg has not been able to accept her weakness as a strength. "Maybe if I weren't so repulsive-looking maybe if I were pretty like you" (18). Meg starts to open up her thought to her mother and assume that she is worse than her but from this sentence Meg already admitted and gave her opinion to her mother. This is Meg's first step to face the reality and search what she mastered in.

I? Heavens no. I'm blessed with more brains and opportunities than many people, but there's nothing about me that breaks out of the ordinary mold.

Your looks do, Meg said.

Mrs. Murry laughed. You just haven't had enough basis for comparison, Meg. I'm very ordinary, really.(55)

Meg's move to share her thoughts with her mother is a major step towards accepting her imperfections. Fortunately, Meg's mom is a mother who never compares her kids. She realizes that every child has their own particularity in them, making it easier for Meg to understand that so far what has been the standard of perfection in a person was wrong. Whereas beauty is not a benchmark for someone to look perfect for others, it doesn't even need someone to say that they are perfect because perfection comes from them. How they love and accept perfection and its imperfections is the key to self-confidence. From the evidence above it can be explained that Meg's mother also realized that it was futile to compare her with that because indeed every human being was created differently. Being who you are is the key to shine, that what Meg's mother wants to say. She just needs to stand and say, "Hey, I am pretty and you too! go and meet someone who knows you best. What she



going to do is leave them who give bad circumstance then catch someone who brings the happiness to you ” (42).

Calvin is a young man who accidentally has a crush on Meg but he doesn't express it. The way Calvin compliments Meg's beauty is one way for Meg to realize that she is actually beautiful. All Meg needed was a compliment from someone that she was pretty and smart enough. If someone has found the right person it will automatically open their aura. She will look really beautiful because she already thinks of herself as beautiful and that embarrassment will disappear if she can open her feelings to the right person. Likewise with Meg, after meeting with Calvin she realized that it is useless to fall into the standards of beauty. She realizes that she is beautiful in her own way.

Oh, yes, you do. You've seen at home how true it is. You know that's the reason you're not happy at school. Because you're different.

I'm different, and I'm happy, Calvin said.

But you pretend that you aren't different.

I'm different, and I like being different.

Calvin's voice was unnaturally loud.

Maybe I don't like being different, Meg said, but I don't want to be like everybody else, either.(155)

Calvin was probably the first guy Meg became friends with and it was he who started to realize that being a different person wasn't a mistake. According to Calvin, the point is that everyone is created different, only that Meg has hidden it. Sometimes someone just has to accept what God has predestined and how in the future he must address these differences. Calvin's words to Meg suggest that he also feels different but he already enjoys the difference and he feels happy.

Feminist perspective theory has focused on power understood in terms of an oppressive or unjust power-over relationship. Wartenberg used the term “domination” to refer to such relationships, though some of the theorists discussed above prefer the terms “oppression” or “subjection,” and others refer to this phenomenon simply as “power.” However, a significant strand of feminist theorizing of power starts with the contention that the conception of power as power-over, domination, or control is implicitly masculinist. In order to avoid such masculinist

connotations, many feminists from a variety of theoretical backgrounds have argued for a reconceptualization of power as a capacity or ability, specifically, the capacity to empower or transform oneself and others. Thus, these feminists have tended to understand power not as power-over but as power-to. Wartenberg (1990) argues that this feminist understanding of power, which he calls transformative power, is actually a type of power-over, albeit one that is distinct from domination because it aims at empowering those over whom it is exercised. However, most of the feminists who embrace this transformative or empowerment-based conception of power explicitly define it as an ability or capacity and present it as an alternative to putatively masculine notions of power-over.

In *Feminist Perspective Theory* the concept is empowerment of women and Wartenberg's concept defines women with their ability, not define with male domination. In this novel *A Wrinkle in Time*, L'Engle explore many strong characters of women are Meg Murry, Mrs. Who, Mrs. Whatsit, Mrs. Which, and Aunt Beast generally the main female character that drives the plot of the story forward. They have a solid core of identity, of integrity whether or not they are themselves aware of it. Meg is capable of real self-knowledge, has the ability to cope with and learn from difficulties, and can take responsibility or at least be aware of their thoughts and actions. Meg is the voice in the novel that's heard the loudest. These strong female characters are full of potential and possibility.

At first Meg is a weak character exists on the side lines not necessarily the side lines of the story, but of her own character. She is vague in their actions and intentions, and are less likely to accept or ready themselves to meet challenges. Meg is a weak character who emerges into the world of the bold, and the courageous.

Meg and Charles Wallace meet Mrs Who, a woman lives with Mrs Whatsit. Calvin asks Meg about her father she cries and then he understands. Meg emerges Mrs. Whatsit on field of grass surrounded by mountains. Mrs Whatsit, Mrs Who and Mrs Which explain they are on the planet Uriel. As the sun sets, they observe a dark, menacing shadow over the planet. Mrs Whatsit explain Mr. Murry is fighting this shadow, called the black things. The children have been sent to rescue him.

Mrs Whatsit and Charles Wallace explain to Meg that they have used a device called a tesseract to travel through space time. They travel to another planet to visit Happy Medium, a fortune-teller. The Happy Medium shows the children that the black things have shadowed planet Earth. Mrs Whatsit, Mrs Who and Mrs Which send the children to the planet Camazotz, which has given in to the black things. Each of the children receives the gift to help them fight. Meg is given her faults anger, stubbornness and impatience.

The story follows the intergalactic exploits of Meg and her beloved 5-year-old prodigy of a brother, Charles Wallace. Their father, a physicist, has been missing from home for a year, his whereabouts unknown. Meg's father is not lost, he is imprisoned by IT, a shadow stretching over the entire universe that is also starting to creep over Earth. To release him, Meg, her brother, and their friend Calvin must travel to Camazotz, via a "tesseract," or wrinkle in time. Camazotz is ruled by IT, a disembodied, pulsating brain that insists on conformity. "I don't understand it any more than you do, but one thing I've learned is that you don't have to understand things for them to be" (26). They are very young. And on their earth, as they never communicate with other planets. They revolve about all alone in space.

Throughout the story, Meg learns that people, including herself, tend to be more complex but also more capable than she ever thought possible. She learns the importance of friendship and teamwork and trusting others, including a former star that self-imploded in an attempt to fight off the darkness Mrs. Whatsit and a sightless, furry, four-armed creature with tentacles for hair Aunt Beast.

While she eventually embraces her own intelligence, she also learns that her intellect has limits, and that intellect alone isn't enough to resist the forces of evil that surround us. Although, slight tangent here, one of my favourite scenes in the book does involve Meg, a true geek girl, fighting off the evil pulsating brain's control by reciting the periodic table and the list of irrational square roots. In the end, Meg learns that it is her ability to love that is her own salvation as well as the universe's, as love is the only thing that the evil brain doesn't have. We all do live in a time when we need unconditional love more than ever. In the face of despair, it's easy to forget that unconditional love has

the power to transform even what appears to be the most hopeless situation. Love, that was what she had that IT did not have.

Meg's journey towards self-discovery and self-acceptance has helped many who have struggled to understand their own value and potential, who have questioned their place in the universe, and who have felt an outsider in a world that continually pushes them to conform. She becomes courageous and confident in who she is and ready to leave her mark on the universe.

Aunt Beast appears after Meg, her father, and Calvin have attempted to tesser away from Camazotz to save Meg and Calvin from IT. The tesser did not go well and Meg is not fully conscious. Meg cannot open her eyes or speak but she can hear Calvin and her father talking. Much of their conversation is exposition, Mr. Murry telling the story of how he came to Camazotz. But when Meg tries to open her eyes, when she is sure she blinks, they do not see and think it's "just a shadow."

When Meg is able to open her eyes and speak, she says she can't move and Calvin insists that she can and that she try, speaking to her with anger in his voice. Meg gets angry with her father for tesser with her when he did not do it properly, and for leaving Charles Wallace behind. Meg's faults, which L'Engle reminds us of so often her impatience and her temper rise up. But more than that, she realizes that her father has not saved them and she feels a deep sense of confusion and sadness.

Meg and Charles believe that something is not right and want to find him, but they do not know where to start. The three Mrs. W's, Mrs. Who, Mrs. Which, and Mrs. Whatsit, arrive to guide the children in the completion of their mission. Mrs. Which seems to come from very far away. "I ddo nott thinkk I willl matterialize commpletely. I ffindd itt verry ttirinngg, andd wee hhave mmuch ttoo ddoo" (32). Mrs. Which announces when they feel her presence like a gust of wind. Mrs. Which always drags out her words as if they are floating in from a great distance and frequently can be felt or heard rather than seen.

Mrs. Which, can easily travel through time and space within the fifth dimension using tesseracts to help Meg and Charles finds him. Mrs. Which looks very much like a stereotypical witch, but for some reason Meg felt that Mrs. Which, despite her looks and ephemeral broomstick, was someone in

whom one could put complete trust. To cope with our difficult movements, ones that could feel almost insurmountable, sometimes a little levity goes a long way. It, less serious, but it can help with approaching it and finding our own way to reach our destination place.

Mrs. Which frequently forgets that the children view things as three-dimensional rather than in five dimensions. She nearly flattens them when she tries to take them to a two-dimensional planet. “Children I apologize” says Mrs. Which. Charles is angry with her, but Mrs. Which sincerely feels badly and did not intend to hurt them. The group continues to travel through time until they locate Meg and Charles' father.

In an effort to understand where his father is, Charles allows the evil Black Thing to enter his mind. When the Black Thing possesses Charles, Meg summons the help of the Mrs. W's, but they are only able to offer her a blessing. Mrs. Which leaves her with the message.

I ccannnott hholddd yyourr hanndd, childd....I hhvve nnott ggivenn yyou mmyy ggiffitt. Yyou hhvve ssomethinnngg thatt ITT hhass nnott. Thiss ssomethinnngg iss yyourr onlly wwapponn. Bbutt yyou mmusstt ffinndd itt fforr yyourrssellff. (245)

Mrs. Who's spectacles symbolise as much of the book deals with the concept of seeing. In many ways, the naked eye is limited: characters and settings are not necessarily what they appear to be. On Ixchel, Meg realizes the bland, greyish-brown surface of the planet that she perceives is only a small portion of the planet's reality. The creatures there rely on other senses to experience their world. Mrs. Who's glasses are one way to see beyond the limitations of the naked eye and perceive the truth. They enable both Meg and her father to see within the walls of the cylindrical prison he is trapped in. Although blinded to his physical reality, Mr. Murry uses the glasses to see outside his prison and therefore escape. Because the glasses help Mr. Murry see through the darkness to escape his prison, they might also represent hope.

L'Engle explains role the of attachment in love through Meg in *A Wrinkle in Time* Meg's love for her father Mr. Murry. She is longing for father's love. She loves her father for that only she is rescuing her father from IT. With the help of Mrs. Who, Mrs. Which and Mrs. Whatsit. She found her father. Another incident for attachment in love Meg love for her younger



brother Charles Wallace. He was controlled by IT but Meg finds IT does not have love, with love of her brother only she saves her little brother Charles Wallace.

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ETHNOCENTRISM AND THE ISSUE OF UNHOMELINESS IN CHIMAMANDA NGOZI ADICHIE'S AMERICANAH

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Abstract

Home is a place where an individual feels comfortable and trusts everyone in it with his or her life, but what happens when that space loses its charm and becomes something that steals away a person's peace of mind and their sense of feeling safe? It takes an incident from the outer space to make one feel unhomey. The space of unhomey is created when the line between the private and personal life gets overlapped. The peaceful state of home is ensured only by the external force which becomes an inevitable cause in an individual's life. Of course, one feels entirely lost when one goes through unhomey space, because it will be the least expected by anyone in a household. Adichie in *Americanah* engraves the concept of unhomey space by the characters Ifemelu and Obinze.

Key word: Unhomey, third space, external forces

Homi K. Bhabha, in his introduction to his essay collection *The Location of Culture*, takes his time to clarify the concepts "Beyond" and "Unhomey" in their present sense through simple terms. Under the heading "Border Lives: The Art of the Present," Bhabha identifies a space where an individual has to confront two or more cultures in order to have their very own identity, and if one fails to recognise themselves with the already existing culture, then they form a hybrid culture rather than neglecting one and favouring the other. The need for a hybrid culture is motivated by the need to have an identity.

Migrants who have been exposed to a specific culture since birth often feel befuddled when they are exposed to a culture that is completely foreign to them. Their mother culture sets an invisible barrier that refuses the idea of completely converting into a culture that is previously unknown. To survive in a country that has a completely different culture from that of their mother culture, the said migrant enters into a space where they go through a revisionary process on what they have to follow under culture in order to have an identity. They realise that they have to form a hybrid culture that is completely flexible, like

that of the mother culture, and the culture that was previously unknown. This hybrid culture is motivated by the aim of being recognised as an individual under categories such as “race, gender, generation, institutional location, geopolitical locale, sexual orientation,” (Bhabha 14) that helps one to be identified in the modern world. Bhabha further proves his point by quoting Renee Green, Frantz Fanon, and Guillermo Gomez-Pena.

Under the heading “Unhomely Lives: The Literature of Recognition,” Bhabha deals with the concept of “unhomely.” He brings in what Sigmund Freud identified as uncanny or unhomely. Freud says, “the name for everything that ought to have remained secret and hidden but has come to light” (qtd in *Location of Culture*, 14, 15). Bhabha, by citing these lines, brings out a space where the concept of home as a safe haven has been completely changed into an underworld by factors such as war, colonial aftereffects, and political and social unrest. The border line between personal and private space is blurred, creating a space that is unhomely. The feeling of being unhomely can be understood by Nadine Gordimer’s *My Son’s Story*, where she brings out the negative effect of the imbalance between public and private life and the sacrifice of the private for the political cause.

Bhabha also cites Tony Morrison’s *Beloved*, a novel that focuses on the traumatic effects of a mother who suffered under colonialism and post-colonialism. Again, Bhabha focuses on the side of an individual that deliberately wants to be recognised with a colonial identity. He ends his introduction by bringing in the line, “I am looking for a join... I want to join in. I want to join” (qtd in *Location of Culture*, 27:4, 5) from Toni Morrison’s *Beloved* to strongly declare the need for identity for an individual, mainly a migrant.

The process of migration as an individual or a group is possible when they are either forced to exit their country by choice or by force. This is possible only when a country is affected either by external forces or internal forces. The external forces included the colonizers who had claimed their rights over the colonized by branding them as people who didn’t have a culture. The natives, who were fascinated by the colonizer’s skin tone and attire, never thought to interrogate their colonizer’s plans for their country. They were rather ignorant and innocent compared to the manipulative and resource-seeking colonizers who saw them as nothing but as goods that could be used for their selfish needs.

As the natives were mere goods for the colonizers, they were uprooted cruelly from their countries and were planted in various other countries without their concern. These slaves, who were transported as goods and were forced to remain as aliens in the foreign country, they were treated very poorly by many of the native colonizers. They were forced to feel unhomely by force and by selfish desires that drove the colonizers to enslave them. These colonizers failed to realize that they were just humans like them. Though this happened in the past, as Edward Said says, “... even as we must fully comprehend the vastness of the past, there is no just way in which the past can be quarantined from the present” (Said 2). As he has said the past is never completely fixed. It was never forgiven or forgotten. Instead, in this ruined past, the natives are left to build an identity for themselves in the present.

The internal force of a nation plays its role in driving away the people from their nation when they begin to search for their identity with reference to their past. These internal forces are mainly the politicians and corrupt businessmen who set forth their own growth over the development of their country. For example, right after Nigeria’s independence from the British Empire, the question of who would lead the country became the most important concern of the nation. This led to many civil wars. The Biafra War, also known as the Nigerian Civil War, is one of the most important civil wars that have been recorded in the history of Nigeria.

Right after Nigeria’s independence on October 1, 1960, Abubakar Tafawa Balewa, founder of the Northern People’s Congress, was appointed as prime minister of the Federation of Nigeria with Benjamin Nnamdi Azikiwe, leader of the National Council of Nigeria and the Cameroons, as the Governor- General. Later, this government was dissolved in the year 1964. Later, Chief Samuel Akintola of the Nigerian National Democratic Party was re-elected as prime minister of the Western Region of Nigeria on October 11, 1965.

In the year 1966, a lot of Nigerian soldiers believed that they had to take things in hand when they observed that the then government was unfit to lead the nation. Nigeria's first military coup showed its resistance by assassinating more than twenty individuals, including Abubakar Tafawa Balewa, former prime minister of Nigeria; Ahmadu Ibrahim Bello, former premier of northern Nigeria; and Chief Samuel Akintola, former prime minister of the Western

region of Nigeria. This military coup was led by Major Chukwuma Kaduna Nzeogwu, a man from the Igbo tribe, and Major Emmanuel Ifeajuna on January 15, 1966. Five months from this date, a lot of people from the Igbo tribe, particularly those who were working as technicians, professionals, merchants, and government employees, were killed mercilessly.

At a conference at Aburi organized by General Joseph Ankrah for the establishment of peace in the year 1967, it was decided that Colonel Odumegwu-Ojukwu would lead all the war refugees and the oppressed people of the Igbo tribe in Eastern Nigeria by forming a republic called Biafra. Odumegwu-Ojukwu owed it to his citizens to lead the state without any kind of corruption and provide for them. This state was recognized by many states, such as Haiti and four African nations: Gabon, Côte d'Ivoire, Tanzania, and Zambia officially. Israel, France, Portugal, Rhodesia (present-day Zimbabwe), and South Africa kept providing Biafra with medical and economic support.

The end of Biafra came when a lot of people died from starvation, lack of security for the people, and continued war between Nigeria and Biafra. This war cost the lives of more than 2 million people. Though peace was established, the people of Nigeria suffered from diseases and many other wars after 1970. Several parts of Nigeria are still suffering from various crises that prevent Nigerians from receiving a proper education and finding work. Though education is provided, only some are entitled to have it.

Due to continuous unrest in the country, many ordinary Nigerians and Nigerian intellectuals migrated to countries such as America, the UK, and many more in an attempt to have a better future. The aftereffects of civil war and the internal conflict in Nigeria are explained in Adichie's *Americanah* through the characters of Ifemelu, Obinze, Aunt Uju, Dike, and many more.

As she was braiding her hair in “Mariama African Hair Braiding” (9) in America, she remembered one of her childhood memories. It was a blissful memory. She remembers “growing up in the shadow of her mother’s hair” (41) and she also remarks on how thick it was. The irony in remembering this memory is that she remembers how her mother loved her long, thick waves of hair and how everyone around her enjoyed and envied her locks, but at present in the saloon, the braider, Aisha, encounters Ifemelu’s hair as a challenge and is irritated by Ifemelu’s hair.

Aisha is even more surprised when Ifemelu admits that she likes her natural hair and has stopped using relaxers on it. Her memory doesn't stop with it; she continues it by recollecting how her father had given the nickname "crown of glory" (41) to her mother's hair. Ifemelu's mother was happy with her hair until one day when Ifemelu was just ten. Her mother looked different that day when she checked off the clock from her work. Nevertheless, her attire was the same, her eyes were unfocused, and her face was flushed. She demanded Ifemelu bring her a big pair of scissors. Even though little Ifemelu was confused, she complied with her mother's demand. She took the scissors from her little fingers and severed her hair without any remorse. Her hair fell down like "dead grass" (41). After finishing this task, she demanded a big bag from Ifemelu. Little Ifemelu was alarmed by the scene unfolding before her eyes and decided to go with her mother's course.

Ifemelu's mother collected all the Catholic objects in the bag and burned them in the place where she usually burnt her sanitary pads along with her discarded hair. As Ifemelu watched her mother from inside the house, she realised that "the woman who was bald and blank was not her mother, could not be her mother" (41). For a moment, she feared her own mother. This happened when she was just ten. That afternoon, her God completely changed. "He became exacting." (42). Relaxed hair offended him. "Dancing irritated him." (42). Before that afternoon, her God allowed her to pray with a rosary, speak with a feminine and high-pitched voice, wear pretty dresses and crack jokes about the Latin songs, she sang with bad pronunciation, but this changed that day. This God of hers demanded starvation as an offering.

Ifemelu recalls her mother going through various fasts and hindering her health, but this changed one day when she had a revelation and changed her God again and again after another revelation. The final church that she decides to stick with is "Miracle Spring" and "Join Guiding Assembly" (43) where all the "newly wealthy" (43) gather for service. This God agreed to be commanded around. He also allowed her to wear jewelry, which was restricted to her by all her former Gods. Ifemelu's mother remembered him on every occasion: "Good morning" or "Good afternoon" was a cheerful "God bless you" (43). When her mother believed that God provided "Pastor Gideon the big house and all those

cars” (44), she believed it to be the result of three collections of money that he collected during the service.

Ifemelu’s mother was so fixated on following a religion that she never realised how Ifemelu was feeling distant from her mother. Her mother’s change from faith to faith made her doubt the existence of a real God. At one point, she realised that her mother was not changing God. Instead, she became obsessed with the pastors of the church, whom she believed to have provided the church’s believers with earthly materials. Her mother was determined to become rich through a miracle, and she believed that it would happen if she followed a pastor from a parish that had many wealthy people.

Ifemelu felt detached from her mother, and she knew that she was going against her will. As a result, she received harsh punishment. She realizes this when she talks back to “Sister Ibinabo” (50) when her mother made her volunteer to decorate the church to bless Chief Omenka for his donation to the church. But Ifemelu refuses to do so, as she states the obvious truth about him being a “419” (51) man, and most of the men who came to that church were 419. This number 419 is a reference to the corrupt and unjust men in her society. Back home, she was punished by her mother. Her mother said, ““ the devil is using you. You have to pray about this. Do not judge. Leave the judging to God!”” (52).

When her mother refused to see the truth behind Ifemelu’s words, it is clear as day to the reader that the money provided to the church was earned by the corrupted men through immoral means. To her mother, these men are men who were blessed with God’s miracle, but to Ifemelu, they are men who don’t deserve any applause. The variation between Ifemelu and her mother’s ways of thinking on the concept of religion created a drift in their relationship.

Ifemelu recalls how her mother used Bible verses instead of actually teaching her about the concept of mensuration and sanitary pads. As the memory matures, the readers are borne to the only refuge she had in her life other than her father. Aunty Uju, who was pursuing her education in medicine, took her time to explain how “to mash an avocado and spread it on her face, to dissolve Robb in hot water and place her face in steam, and to dry a pimple with toothpaste” (51). Ifemelu remembers her aunt having “talked her through her first menstrual period” (52). Her aunt was more like an elder sister who took

care of her younger sister. Her mother never took care of her child with motherly love. Instead, her whole focus on disciplining was influenced by what the parish pastor preached to her.

When Ifemelu's mother torments her for speaking her mind, her aunt advises her to keep her thoughts to herself selectively, by keeping in mind the place she is in. Her aunt made her feel secure, but it was short-lived as her aunt gave into the mirage of materialized temptation by deciding to be the mistress of "The General" (44). Before giving into the temptation, she was planning to become a doctor with a mentor, but it all changed after she decided to take a short cut to have a steady job. Landing a job was not a piece of cake in Nigeria, as lots of youngsters fresh out of college had to face the plight of unemployment.

Only weeks before, she had been a new graduate and all her classmates were talking about going abroad to take the American medical exams or the British exams, because the other choice was to tumble into a parched wasteland of joblessness. The country was starved of hope; cars were stuck for days in long, sweaty petrol lines; pensioners were raising wilting placards demanding their pay; lecturers were gathering to announce yet one more strike. But Aunty Uju did not want to leave; she had, for as long as Ifemelu could remember, dreamed of owning a private clinic, and she held that dream in a tight clasp. (45-46)

Ifemelu's aunt was enjoying the luxury of being the general's mistress. She had a job at the military hospital in "Victorian Island" (45) and a "new house in Dolphin Estate" (45). Meanwhile, Ifemelu's father was fired from his job as he refused to "call his new boss mama" (46). She recalls how her father always supported her all the time during her fixation with what the pastor of a parish had to say. Also, notice how he covered up his insecurities about not having a Master's degree by using well-mannered English. Ifemelu felt even more unhomey after Aunty Uju's recent departure and her father's unemployment. Her mother was really upset about it and kept reminding him about his incident.

In her recollection of memory, Ifemelu remembers her first encounter

with Obinze, who made her feel comfortable in her own skin. He was a boy from a single-parent household. Obinze was nothing like the other boys in Lagos; as a boy from Nussuka, he shared her interest in reading books. As they slip away from the crowd to find out about each other, she learns that he had his eyes on her right from the beginning and admits it by saying “I’m chasing you” (60). She called him “Ceiling,” (93) with the aim of conveying to him that she felt at home with him. He admired her straight-forward and honest answers. As the days grew, their bond became stronger, so strong that he called Ifemelu for dinner at his home with his mother. Though she was uncomfortable in the beginning, in the new surroundings, he and his mother made her feel at home. The way he discussed and spoke with his mother made her feel relaxed. Her relationship with his mother grew to the point that she dropped by their home often.

Ifemelu, in her recollection, also remembers that Ginika, one of her closest friends, is moving away to America. When she shared this news with her parents, Ifemelu, her mother said, “They are blessed” (65) and her father remarked, “At least they are fortunate to have an option.” (65). Ginika’s parents were professors, and as the condition of the university was so poor, they decided to immigrate rather than stay in an unyielding land. In Ginika’s father’s words,

We are not sheep. This regime is treating us like sheep, and we are starting to behave as if we are sheep. I have not been able to do any real research in years because every day I am organising strikes and talking about unpaid salaries, and there is no chalk in the classrooms. (64)

As the memory grows from the occasional visit to her present, she reveals her reason for immigrating to America. When she was studying at a university in “Emenike” (88), the university she studied at kept closing off due to strikes. These strikes were initiated by professors who had enough of teaching without earning a salary at their university. These strikes made many “young people become armed robbers” (91). In Obinze’s mother’s words, ““I understand the students” grievances, but we are not the enemy. The military is the enemy. They have not paid our salary for months. How can we teach if we cannot eat?” (91).

The situation at Nigerian universities deteriorated as a result of the

ongoing strikes; many crimes began to occur in and around the universities, and soldiers were stationed in many of them to keep things under control. Ifemelu decides to take her studies to America because of Obinze's motivation. In America, she was unwelcomed and she had to tolerate a lot of unfair treatment just because she was from Nigeria. Sometimes, she stayed with her aunt, who had moved to America after the General's death, just a few years after she gave birth to their son, Dike. She adapts to living like an American rather than a Nigerian American.

Aunty Uju had transformed into someone Ifemelu could not recognize because she had taken to hiding her unhappiness behind the mask of being an American. She's so into being an American that she questions, "Will you be able to cope?" (17) When Ifemelu voices her wish to go back to Nigeria, Ifemelu's return to Nigeria shows that she decided to stay in her homeland rather than feel unhomey in a place where she has to undergo various unfair treatments. Returning home, she gets in touch with her "ceiling" (19) and she gets to know his life during her absence.

Dike, Aunty Uju's only child son, is someone who will be categorized as half-baked by Nigerians. He had a Nigerian mother and a non-Nigerian father. Though he doesn't talk about it, he gets into trouble for his skin tone. As his mother was so focused on being a successful American, she never took the time to listen to what he had to say. When he was a baby, Ifemelu, his cousin, took care of him as much as possible until she got tangled up in her own problems. He felt that he was unwelcome in the school where he studied, and because of his skin tone, he was subjected to prejudice. Rather than supporting his son with encouraging words, Aunty Uju kept complaining about his school management. He let his troubles out to Ifemelu, but when she was not there when he needed her; he decided to end his suffering by suicide.

Though it was not too late, Ifemelu and her aunt managed to save him. They realised that Dike was driven to do so after having enough of feeling as if he did not have an identity in the place he was in, just like Ifemelu, Obinze, and Aunty Uju. Though Ifemelu went out of her native country in order to find an individual identity for her, she fails to do so and returns home. This happens even to Obinze. Even though Dike did not permanently reside in Lagos, he felt at home when he accompanied Ifemelu back to Nigeria.

As a result of migration, migrant people from various continents are treated cruelly on various levels by the natives of the continent they migrate to. The natives refuse to treat them equally because of their skin tone, appearance, and ancestral history. Failing to look beyond their appearance is a clear indication that they do not value them. They fail to see that the migrants are oxygen-in taking humans just like them who have decided to have a better future in that country by proving their intelligence and unique qualities. These migrants are requesting the natives to treat them as humans, with humanistic thoughts, rather than as mere commodities from another continent. They ask the natives to try and put themselves in their shoes in order to understand what they had to go through to get to where they were.

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SOCIO- CULTURAL FACTORS INFLUENCING WOMEN PARTICIPATION IN SPORTS ACTIVITIES AT TARUVAI STADIUM IN THOOTHUKUDI TOWN; THOOTHUKUDI DISTRICT

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Abstract

Women participation in sports has been a controversial issue all over the world and Tharuvai Stadium is not an exception. This study examined the socio-cultural factors influencing women participation in sports in Tharuvai Stadium of Thoothukudi District. Results obtained from this study revealed that physiological mark up, Cultural beliefs; Social inclusion, Family background and Religion are factors that significantly influence women participation in sports in Tharuvai Stadium of Thoothukudi District. Hence, it recommended that religious institutions and societal organizations should frequently organize conferences, symposium and workshops with a view of promoting the inclusiveness and active participation of women in sports across the study area.

Key words : Women participation, socio-cultural factors, physical activities, female participation, International Olympic Committee (IOC), Socio-Cultural Beliefs, Psychological Barriers

Introduction

A sport is an integral part of physical education which involves training of the mind and body through physical activities. It involves all form of physical activity which, through casual or organized participation, aims at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels. Hence, the maintenance of physically active leisure-oriented lifestyles has become increasingly important in developed societies. Involvement in sports and other sport related activities is significant as it leads to competence in the physical world of sport and can also extend to the real life situation. Consequently, it offers important opportunities to enhance health and wellbeing as well as cultivate cultural diversity and promote social inclusion.

Women play an important role in society as procreators of the coming generation, as well as producers of goods and services. In the modern economies they are playing an important role in the labour force. However, in many communities, traditional perceptions of women as inferior to men continue to prevail as many people invoke the preservation of

African culture to justify the subordination of women. As a result, men usually dominate women in the political, religious, economic, academic and domestic spheres. Women participation in sport has come a long way. Women's participation entails the provision of equal opportunity to women to take part in sports activity. It implies quantitative and qualitative participation of women in sports. Efforts have been and are being made in getting more females to participate in sports. However, a lot more effort is still required to generate greater female participation in the world of sport.

Women's participation in sports is much under the influence of defined gender roles as it has encountered many problems from the beginning. The thing that is important in entrance of men and women in sport is the entrance to a sport which is not traditionally defined with discrimination in favour of one sex. Cultural race and social class are both of important factors in the experiences of men and women discrimination in sport. For women, one of the biggest barriers associated with levels of activity is the perception that physical activity is unfeminine. This is apparent in the gender imbalance evident across the higher levels of the sporting industry, the media portrayal of sporting activity and the formative experiences of many women (WHO, 2010). Thus, today, one of the important and remarkable things in international community is maintaining and observing the rights of women and equality between men and women and gender discrimination.

Socio-cultural barriers refer to the specific social and cultural limitation, practices, beliefs and traditions within a community or society which might encourage or discourage physical activity. Women are observed to be poorly represented in sports as players, coaches, advisers and as team administrators. For instance, many Muslim women due to the aspects of their religion rules on mixed gender sports and dress code requirements have either prevented or given the impression of preventing participation. Socio-cultural barriers might occur in the other direction. Again, drawing on the example of Muslim Women, service providers might hold negative attitudes relating to the specific cultural and religious needs of Muslim Women.

The emergence of women in sports is largely a twentieth century phenomenon. In fact women made their first appearance in the Olympics in the 1900. Even when the Olympics were revived, women were not allowed to participate. The males have offered varied rationalizations for subordinating women and much of it has rested upon the dubious assumptions of women's inherent weakness. The notion that women have been conditioned to be what they are often is deeply rooted in the prejudicial social pattern of different cultures in Nigeria. Women through the ages have always been viewed to be made of milk and

honey. Consequently, in keeping with this metaphor, a feminine picture of a woman was conjured up which seems to militate against females doing anything too physical.

History of women's participation in sports

Women's participation in sport has a long history. It is a history marked by division and discrimination but also one filled with major accomplishments by female athletes and important advances for gender equality and the empowerment of women and girls. Sports has been largely dominated by men in terms of participation and governance. Although there are unyielding evidences to suggest that women benefit immensely economically, socially and physiologically by participating in sports, the space for participation and involvement has been constrained thereby bringing about a form of discrimination against women in sports.

The history of the Olympic Games provides a glimpse into how dominant cultural ideologies of gender have been reinforced and challenged throughout history. The Greeks were the visionaries of this ancient sport exhibition. It is presumed that the Olympic Games were originally sport festivals, connected to religious rituals and sacrifices, in which wealthy, able-bodied young men played games that, were fashioned to mimic the requirements of Greek warriors of the day. The original festivities excluded women not only from participation but from spotting. It is a widely held belief that females who were caught viewing the Olympic festivities were punished by death. When Baron Pierre de Coubertin resurrected the modern Olympics in 1896 not much had changed women were still excluded from participation in accordance with the social ideologies of appropriate gender roles for men and women at the time.

It was not until the 1900 Olympic Games that women were allowed to compete. However, even then, very few entered or were provided any type of support or media coverage. Slowly over the years, sports for women have been added to the Olympic Games and participation for women has been encouraged and celebrated. The London 2012 Summer Olympic Games served as a gender equity milestone; it was the first Olympic Games in which all 26 sports were open for both genders and in which all countries represented included female athletes. This Olympic Games was also the first to have more female athletes representing the United States than male athletes. The International Olympic Committee (IOC), which from 1894 to 1981 had no women members, did not approve a women's 1500-meter run until the 1972 Games in Munich.

Barriers to women's participation in sports

While opportunities to play are growing, not everyone partakes in sport. Therefore, it is important to reflect upon what keeps women from participating in certain activities. These barriers include, but are not limited to:

- (a) Living environment (Environmental barriers)
- (b) Culture and religion (cultural barriers)
- (c) Social barriers
- (d) Psychological barriers
- (e) Specific barriers for women.

Environmental barriers

Characteristics of the living environment for a person play a significant role in the sport opportunities available. Factors such as rural or urban living, the presence of sidewalks in the neighbourhood, public transportation availability, and access to a recreational facility can all affect one's chances for sport participation.

Cultural barriers

Women who choose to participate and get involved in sporting careers are stigmatized by the society as not choosing a recognized and profitable career. The demands placed on women hinder their involvement in exercise. All women face pervasive and invasive messages about how women's bodies should look, move, answer, develop and they face rigid social definitions of attractiveness. Sex role stereotyping strongly influences Women's participation or non-participation in sports or Physical Activity. In the US, inequities in sport participation are also prevalent between different ethnic groups. Specifically, low percentages of minority boys and girls play sports.

Social barriers

Social factors such as social support are significant correlates of exercise behaviour. Social limitations to women's involvement in physical activity include lack of social support, role conflict, lack of equal opportunities and limited role models. The social influences of family and friends are a huge indicator of whether a girl will be active in sports. Thus, if her family and friends do not participate in or value playing sports, neither will she. A research study conducted and found that sexual violence against women such as sexual harassment is a limitation to their initiating and maintaining physical exercise/ sports program. Lack of support from parents, husbands, siblings, friends, peers and social institutions constitute serious limitations to females' exercise behaviour. The women are more likely to participate

when there's a role model. Also adequate and equal media coverage is not given to females who participate in sports compared to their male counterparts.

Psychological barriers

Women's participation in physical activity/sports includes lack of time due to work, health reasons, and lack of energy, motivation or need. Self defeat, anxiety and mistrust is a barrier to women's involvement in physical activity. Psychological limitations to a woman's participation in exercise include role conflict, low self esteem, or absence of role models. The Women's Sports Foundation indicates that girls are often faced with a lack of positive role models, fewer opportunities, and a watered down quality of sports available to them. Additionally, many women have low self-efficacy and confidence when it comes to sport participation, worrying they will be inept in the activity and create embarrassment.

Specific barriers for women

For young girls attempting to pursue a life filled with playing sports, significant road blocks may limit what they are able to do .If a girl can overcome these obstacles, she still faces hurdles regarding her chances of continuing to play sports. After high school, physical activity decreases by almost 50% among females. Women often feel that even though it is acceptable for them to engage in sports, it is difficult to juggle this desire while still fulfilling their expected social roles. Specifically, as women face significant transitions such as beginning college, starting a job, getting married, or having a child, they often feel it is impossible to play sports and perform in their new responsibility. Feelings of guilt and in adequacy for taking time for her have also been found to reduce the likelihood of a woman engaging in sports.

Another common barrier women face is fear of social evaluation. Young girls, college females, and adult women all have indicated anxieties related to social evaluation within sport. These feared assessments include the stigma of sports being masculine, comparing herself to others, the fear of being gazed at by a male, and anxiety about the type of clothing that is expected to be worn.

Achievement motivation theory

Mankind has always been motivated for achievement in school, in business life or in any situation during his or her life, because the need for success or positive emotions that arise after being successful are indispensable for human beings. Achievement motivation is one of the most important issues in the studies related to motivation in the sport environment. Achievement Motivation Theory, which is a frequently used motivation theory in the field of

sports and exercise psychology, started with Murray and was developed by McClelland, While Murray describes the achievement motivation as an attempt to accomplish a task, overcome obstacles and perform better than others, Gill defined it as resisting failure, striving to achieve a task and searching for ambiguous situations. Cox describes the achievement motivation for the sports environment as "the tendency of the athletes to approach and avoid the competition". In general terms, achievement motivation is evaluated as the motivation of the athlete to continue to work, to maintain duty in failure and to have pride in achievement.

Objectives of the study:

The main objective of this study is to examine the socio-cultural factors influencing women participation in sports in Tharuvai Stadium in Thoothukudi District. Specifically this study aims at ascertaining if:

The study has the following objectives:

1. To know the personal achievements of women sport persons.
2. To study the motivational factors associated with developing interest in sports.
3. To analyse the barriers responsible for discouraging women in sports.
4. To know the Socio-Cultural factors affecting the respondents.
5. Family background is a factor influencing women participation in sports.
6. To know about the healthy relationship between the trainer and the respondents.

Findings and suggestions:

Findings

1. Majority of the sample respondents belong to the age group of 20-30 (35%).
2. 46% majority of the educational qualification under the College level.
3. 81% of the respondents are unmarried
4. Majority 19.13 % of the sample respondents to achieved in running in Personal achievements.
5. 41% of the respondents are strongly agreeing the Socio- cultural factors.
6. 63% Majority of the sample respondents to disagree the attitudes statement.
7. Majority of the sample respondents to strongly agree the motivational factors
8. Majority of the sample respondents to strongly agree the family – Culture statement.
9. More than 80% of the sample respondents to strongly agree the all statement about the family background is a factor influencing women participation.
10. Majority of the sample respondents to strongly agree the relationship between the trainer and the respondents.

Suggestions

1. Government at all levels should create enabling environment for unfettered participation of women in sports and its management.
2. Government should encourage female participation in sport by providing scholarship and other incentives to female athletes who excel in any sporting competition.
3. Mass media should organize enlightenment programme that will eliminate all socio-cultural biases against female participation in sporting activities.
4. Improve sports facilities and equipment in schools so as to enable more participation in sports by both sexes.
5. The socio cultural factors that influence women's participation in sports the family support , social and cultural belief like “ excise causes in fertility and gender roles, existing social barriers like “sports being for those in school”, and that these socio-cultural factors in turn, inhibit the participation of women in sports.
6. Most females engage in sports only within a school system and afterwards neglect it.
7. The negative attitudes observed by the researcher areas a result of the influence and reach of these socio-cultural factors. They limit the interest of the females in sports, and mostly make the females ignorant on the benefits of sports to health.
8. Women to participate will also change over time and factors influencing participation have individual, cultural and social origins.

Conclusions and recommendations

The outcome of this study has identified some of the socio-cultural factors that influence female participation in sports i.e. culture, parent, religion, peer group and gender. The low involvement of women in sports is not due to the lack of interest in sports by women. It is due to the long history of direct and indirect forms of discrimination and stereotyping as well as many other problems that women have to contend with. Arising from findings of this study, the following are recommended:

- Government at all levels should create enabling environment for unfettered participation of women in sports and its management.
- Government should encourage female participation in sport by providing scholarship and other incentives to female athletes who excel in any sporting competition.
- Mass media should organize enlightenment programme that will eliminate all socio-cultural biases against female participation in sporting activities.

The private organizations and individuals in the society should support the government at all levels to provide and improve sports facilities and equipment in schools so as to enable more participation in sports by both sexes.

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A STUDY ON IMPACT OF SOCIAL MEDIA IN CONSUMER BUYING BEHAVIOUR AT BOOBALARAYERPURAM AREA IN THOOTHUKUDI DISTRICT

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ABSTRACT

Social Media Marketing is very important and it is among the most successful tool and technique in the field of every type of advertising. It is already known that how various marketing tools and techniques can be increased number of selling articles is the main aim of every businessman. No doubt it can raise the profit of a various companies exponent. The main aim of this study is to examine aimed to examine how social media marketing will affect the final consumer behavior among person who mostly use social media websites and also to find out the fore casted relationships among various social media marketing activities, customer activities and behavior of the consumer.

Social Media has changed the organizations do business with the help of computers online over past few years, and as result social media marketing has created its own name in the business world. There are many online networking sites are there which affect consumer behavior. Like Google+, LinkedIn, YouTube etc. Now a day's Social Media is using by almost all the ages of consumer's maybe the college students, working class and even old age people too. Millions of emerging young adults use Social web sites. Social websites like Orkut, Facebook and My Space is having many features which affect and attract much number of people.

Today we are living in 21st century; it is very difficult for the consumers to spend time on purchasing the product because of busy schedule. Now a day's users are acquiring followers and subscribers giving information by social media how to purchase the goods online without wasting time to go personally.

Introduction

People were communicating with other people without a language in olden days. There is a massive change in the method of communication in modern days. Social Media have become a convenient way to communicate among all age clusters. The Internet and particularly social media have modified the shoppers and marketers communicating medium. The Internet has characteristics such as - the power to inexpensively store huge

amounts of data at different locations-the powerful search engines, organizing and disseminating of data-the power to function a physical distribution medium as software - relatively low prices. With the help of net and the presence of various social media sites it is now possible for business people to meet world-wide customers at single click of the button. Thanks to the internet technology, which helps the consumer to search the product on the web, view their view a drinking of existing customers for the product before he purchased the product. Consumers use the technology now a day too much as computer is used by many consumers so use of online marketing. Consumer purchase decision is influenced by social media through group communication. The web platform is an ew method for developing the business. Social media modifies the communication methods between sellers and buyers. E commerce influences the consumer in their purchase decision. Communication through social media is a new platform to exchange information about product and services. The analysis of consumer behavior is the core activity for selling product and service since most consumers' are using the internet and on-line social media tools. Social media become an important media to introduce and market products and also to do surveys. Nowadays Social media is an important marketing tool for promotional activities. Hence it becomes necessary to perceive how Social media is affecting consumer behavior.

Social media marketing techniques

The main purpose of social media marketing is communicating about the product to the consumer and makes them accessible to people who doesn't know about the product. Social media is used by companies to promote the product to the prospective customers. Social media marketing helps the consumers at a various stages of buying process.

A research indicates that of thee ten factors for effective marketing , Social media is one amongst them , which indicates if any brand is in operative on social media, then the result will be less chances of the brand to be present on Google searches.

There are large no of users in face-book, Twitter and Google and there is huge exchange of information which made the business firms to use the social media to interact with prospective customers.

Instagram has hundred thirty million users monthly and twitter has two hundred ten million monthly users and the average communication rate ranges from 1.46 percent on Instagram and 6.03% in the case of twitter.. The cost involved in social media marketing is very less when compared to ancient modes of advertisements using TV/Radio/Print channels. In fact there is no price involved when using social networking site, it also covers wide range of people.

Many firms are now changing their approach for interaction with customers they are using online platforms for better client interaction and visibility. Social media are used as a platform by customers to post reviews, recommendations, ratings, raise queries to the firms. Companies are employing people to handle social media communication with the customers and they are working as online community managers. The job of these managers is to handle social media communications in an effective manner and win the trust of customer. Firms are taking steps to manage client issue, identify various modes of social media marketing, and engage the customers to influence the new and prospective customers to market their product/service.

Targeting, COBRAs, and Electronic Word of Mouth

To successfully advertise online, social media marketing is used which includes consumer COBRA & e - wom. The comments post by users of Facebook, that is likes and dislikes are shared with advertisers. When there are more likes for a product/service, then business people will more advertise for the product. COBRA will help to market their product with the consumer. Consumer to consumer interaction in the social media will help the firms in a cost free advertisement. Product review, Ranking, recommendation are examples of e-wom. On the other hand, if there is a negative review by customers, which will have a negative impact on the marketing of the product.

Review of literature

S. Bion Aldo Syarief et al., (2015)

This study analyzed the role of social media, especially Twitter, a social networking site, in communication with friends, with respect to the buying intension for the products of students companies at president University. A sample of 140 students of President University was taken to study and was asked to fill the questionnaire. Various statistical tools like structural equation model, factor analysis, liker scale were applied by using SPSS package. 8 hypotheses were framed and tested. Out of eight hypotheses, 6 showed positive relation and rest showed negative relation.

Waqar Nadeem et al., (2015)

This study was conducted on how consumers buy goods online via peer recommendations and Face book. This study also tested whether the website service quality have an influence on shopper trust, attitudes, and loyalty intentions. A survey was conducted with Italian teenage customers who uses Face book to buy clothes .various hypothesis was framed and these hypotheses were tested by structural equation modeling. The result of the

study indicate that online service quality and use of Face book for on-line buying have a great impact on consumer trust.

Methodology:

Procedure for research methodology for the current study of impact of social media on consumer buying behavior with reference to Thoothukudi district

The most important thing has to understand that Research methodology is system to solve the related problem. It is not only science but also an art how to do research scientifically. It is the logic to be used in the context of research. Here problem can be identified from the various literature reviews and previous knowledge. The researcher has to understand the problem which gives him the direction how to solve the problem. Research methodology consists of series of actions or steps necessary to carry out research work effectively. It not only involves research methods but also logic behind the methods we use, in the context of research.

Primary Objectives of the study:

1. To study the concept of social media.
2. To evaluate the various channels preferred by consumers for buying decision over traditional Channels.
3. To analyses the impact of social media on consumer buying behavior.
4. To find out which is the best social media preferred by customers.
5. To find out impact of social media on consumers with reference to Boobalarayerpuram area.

Chi-Square test result:

Particulars	Calculated Values	Value
Facebook.	Chi-square	69.844
	Df	8
	P-value	.000 ^{*a}
Instagram	Chi-square	87.281
	Df	8
	P-value	.000 ^{*a}
Whatsapp	Chi-square	43.533
	Df	8
	P-value	.000 ^{*a}

Radio.	Chi-square	22.907
	Df	8
	P-value	.003 ^{*,a}
Television.	Chi-square	108.605
	Df	8
	P-value	.000 ^{*,a}
Newspaper.	Chi-square	84.680
	Df	8
	P-value	.000 ^{*,a}
OnlineMarketing.	Chi-square	85.256
	Df	8
	P-value	.000 ^{*,a}
Results are based on nonempty rows and columns in each innermost subtable.		
*.The Chi-square statistic is significant at the 0.05 level.		
a. More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.		

Interpretation: Since p-value for all the marketing channels is less than that of 0.05 indicates that we should reject null hypothesis and conclude that Area of consumer and impact of different marketing channels are not independent of each other.

Findings

- ❖ Majority of respondents are 43% between below 20 yrs.
- ❖ Nearly 60% of respondents have finished under graduates.
- ❖ The study reveals that 51% of the respondents are females.
- ❖ In the present study 73.33% are unmarried.
- ❖ Most of the respondents 50% are students.
- ❖ Nearly 20% of the respondent's monthly income less than 5000.
- ❖ 55% of the respondents are not facing the problems while purchasing in online.
- ❖ Most of the respondents 40% content and engagement by Instagram.
- ❖ In the present study 23% of respondents are using whatsapp in the social media.

Suggestions

- ❖ Consumer should be educated on online shopping procedures with proper steps to be followed while online shopping.
- ❖ Transactions should be safe and proper security should be assured to the people making online purchases.
- ❖ Government should play a pivotal role in encouraging online shopping.
- ❖ The study highlights that convenience, accessibility, scope, attraction, reliability, experience and clarity are the important factors considered by the consumers.
- ❖ An awareness program may be conducted by the leading online shopping companies in schools and colleges to enrich their knowledge on online shopping.

Conclusion

The most preferred product of online buying cloths and jewelers & other products remains the least preferred choice of online consumers. Among the payment options, payment on delivery through cash is the safest choice of payment, while debit card is next preferred choice, credit card & other transfer is least preference choice.

Of course, online shopping won't ever completely eliminate its physical counterpart there are still areas where we prefer to go into a shop. But there's no going back and online shopping will become an even more central part of our lives, growing more sophisticated with each passing year.

Online shopping is becoming more popular day by day with the increase in the usage of World Wide Web known as www. Understanding consumers need for online selling has become a challenge for marketers.

In conclusion having access to online shopping has truly revolutionized and influenced our society as a whole. This use of technology has opened new doors and opportunities that enable for a more convenient life style today. In developing countries like India it is seen that there is a gradual growth for online shopping.

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A STUDY ON IMPACT OF ONLINE CLASSES FOR THE SCHOOL CHILDREN IN MAHILCHIPURAM AT THOOTHUKUDI TOWN; THOOTHUKUDI DISTRICT

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Abstract

The covid-19 crisis has forced education systems worldwide to find alternative to face to face instruction. As a result online teaching and learning have been used by teachers and students on an unprecedented scale. Since lockdown either massive or localized may be needed again in the future to respond to new waves of the infection until a vaccine becomes available it is of almost importance for government to identify which policies can maximize the effectiveness of online learning. This policy brief examines the role of students' attitudes towards learning in maximizing the potential of online schooling when regular face to face instruction cannot take place. Since parents and teachers play a fundamental role in supporting students to develop these crucial attitudes particularly in the current situation targeted policy interventions should be designed with the aim of reducing the burden on parents and help teachers and schools make the most of digital learning.

KEY WORDS

Online Classes, Corona virus disease, On-line education, Distance education, Online learning,

INTRODUCTION:

Corona virus disease (COVID-19) is firstly identified in Wuhun city, Hubel province, china in December 2019 as a pneumonia origin. Later, the international committee on taxonomy of viruses (ICTV) identifies the causative agent of COVID-19 as a novel corona virus, severe acute respiratory syndrome coronaviirus-2 (SARS-COV-2). COVID-19 outbreak spreads rapidly not only in china, but also worldwide, therefore, the world organization (WHO) has announced it as pandemic on March 12, 2020. The total number of confirmed cases and mortalities are 23,491,520 and 809,970, respectively, in 216 countries as of August 25, 2020

Several governmental measures have been taken to counteract the risk of disease spreading. These measures include travel restrictions, mandatory quarantines for travelers, social distancing, bans on public gatherings, schools and universities closure, business closures, self-isolation, asking people to work at home, curfews, and lockdown. Authorities in several

countries worldwide have declared either lockdown or curfew as a measure to break the fast spread of virus infection. These measures have a negative worldwide effect on the business, education, health and tourism.

COVID-19 pandemic has affected all levels of the education system. Educational institutions around the world have either temporally closed or implemented localized closures affecting about 1.7 billion of students' population worldwide. Many universities around the world either postponed or canceled all campus activities to minimize gatherings and hence decrease the transmission of virus. However, these measures lead to higher economical, medical, and social implications on both undergraduate and postgraduate communities. Due to the suspension of classroom teaching in many colleges and universities, a switch to the online teaching for undergraduate and graduate students becomes effective. This form of learning provides an alternative way to minimize either the contact between students themselves or between the students and lecturers. However, many students have no access to the online teaching due to lack of either the means or the instruments due to economical and digital divide.

Few studies highlighted COVID-19 in relation to educational studies. COVID-19 has a profound impact on medical students, dental medical students, and radiology trainee. Recently, the American Veterinary Medical Association (AVMA) showed that COVID-19 adversely impacted veterinary practices based on a large survey including about 2,000 responses. However, there is no studies investigated the effect of COVID-19 on students in veterinary medical field. Therefore, the current study was conducted to analyze the impact of COVID-19 pandemic on the academic performance of veterinary medical students and researches during the lockdown

Online education has gained immense popularity among working professionals and students pursuing education. These categories of online learners find immense benefit in the autonomy and flexibility that these courses offer. Online courses can be planned around their schedule which may include full time employment, internships and caring for family. Online learning can also help them take out some quiet time to study.

Distance learning has been around for a long time, even before technology, made it extremely accessible. Traditional schooling is now seeing and increased proliferation of virtual training materials and online courses. Even in a world of tried and tested schooling systems and curricular, the most successful schools are the ones who adapt to the changing times, as well as to the expectation of students, parents and the society. If online education is here to stay, then what are their implications for traditional learning? Instead of focusing on



pros and cons, the conversation we should be having today is about leveraging online education to make our education systems more conducive to learning.

FACE-TO-FACE LEARNING:

Face-to-face learning is an instructional method where course content and learning material are taught in person to a group of students. This allows for a live interaction between a learner and an instructor. It is the most traditional type of learning instruction. Learners benefit from a greater level of interaction with their fellow students as well. In face-to-face learning, students are held accountable for their progress at the class's specific meeting date and time. Face-to-face learning ensures a better understanding and recollection of lesson content and gives class members a chance to bond with one another.

Face-to-face learning is essentially a teacher-centered method of education, and tends to vary widely among cultures. Many modern education systems have largely shifted away from traditional face-to-face forms of educational instruction, in favor of individual students' needs.

WEB FACILITATED:

“Course that uses web-based technology to facilitate what is essentially a face-to-face course. May use a course management system (CMS) or web pages to post the syllabus and assignments” (Allan & Seaman, 2003, p6). One to twenty-nine percent of the course is delivered online in web-facilitated environments.

ONLINE LEARNING:

Schools that digitally transform thrive. Create a technology environment that actively engages students and teachers, and delivers personalized digital learning experiences for student success. It begins with a reliable, secure network that supports your smart campus and its evolving needs.

Organizations helps schools succeed and has the experience you need with communications and networking technologies that enable digital transformation and successful 21st century teaching and learning. With an Intelligent Campus, your cloud-based voice and network solutions provide options, built-in security protects digital communications, and high-performance networking and Wi-Fi empowers students and researchers.

FREE ONLINE PLATFORMS THAT SUPPORT LIVE-VIDEO COMMUNICATION

There are many live-video communication platforms are available in web, but some of the free online platforms are as listed below which can be used by learners of all categories:

ZOOM



Cloud platform for video and audio conferencing, collaboration, chat and webinars.

GOOGLE MEET

Video calls integrated with other Google's G-Suite tools. Video meeting recordings, Screen sharing, Join calls using Google Calendar

SKYPE

Video and audio calls with talk, chat and collaboration features.

FACEBOOK LIVE

Is a great fit for businesses, influencers, or individuals who are looking to broadcast demos, videos, or showcase their company culture while streaming live, followers on Facebook can comment and chat live, schedule videos ahead of time to gain excitement.

YOUTUBE LIVE

Is a platform for demonstrating a product with live interaction, hosting an educational session to teach audience with screen sharing or using a whiteboard, having features with Location tags and advanced scheduling.

THE CLASSROOM ADVANTAGE:

A school provides structure, support and a system of rewards and penalties to groom its students. Traditional classroom education offers the benefit to face to face interactions with peers which are typically moderated by a teacher. It provides children, especially those in their early developmental years, with a stable environment for social interactions, helping them develop skills like boundary setting, empathy and cooperation. It also allows plenty of room for spontaneity, unlike a virtual learning setup.

ONLINE EDUCATION FOR EDUCATORS:

Online education can also be designed to accommodate a variety of learning styles among students. As educators it is likely that we will have to put in additional efforts to incorporate online learning programmes into curriculums in the most suitable manner.

Online training programmes are helping teachers/educators systems and leadership both independently and with the support of their peers and learn new instructional skills that are relevant to their career. These programmes can help them develop new skills and capabilities in their students with the help of technology and interdisciplinary approaches. As the overlap of the traditional and online modes of education is becoming more and more inevitable we owe it to our students to make their education and careful planning.

THE CHALLENGES OF ONLINE LEARNING:

There are however, challenges to overcome. Some students without reliable internet access and /or technology struggle to participate in digital learning; this gap is seen across countries and between income brackets within countries. For example, whilst 95% of students in Switzerland Norway and Austria have a computer to use for their schoolwork, only 34% in Indonesia do, according to OECD data.

In the US, there is a significant gap between those from privileged and advantaged back grounds: whilst virtually all 15 year-olds from a privileged background said they had a computer to work on, nearly 25% of those from disadvantage backgrounds did not. While some schools and government have been providing digital equipment to students in need, such as in NewSouthWales, Australia, many are still concerned that the pandemic will widen the digital divide.

OBJECTIVES OF THE STUDY:

- ❖ To develop the quality of learning and teaching by online education.
- ❖ To convene the learning style or needs of students by online education.
- ❖ To develop the efficiency and effectiveness of teaching and developing via online education.
- ❖ To recover user accessibility and time flexibility to connect with learning in the learning process via Online Education.
- ❖ To expand and improve technology, support tools to meet the school education's present needs and expectations.
- ❖ To Increase security awareness throughout the learning methods in Online Education.
- ❖ To know about the students satisfactions during online classes.
- ❖ To find out the using of tools for online classes.
- ❖ To know the suitable time for online classes.
- ❖ To find out the impact of online classes.

LIMITATIONS

All the students come from the same school due to resource limits of this study. Therefore, whether the findings could be generalized to a broader context needs further examination in future studies. Stratified sampling on a larger scale could be adopted in the future study.

Survey is the only tool used in this study to explore how students use internet for learning and entertainment at home. The level of realism may be negatively affected since participants are studied outside of the context where they use internet. Ethnographical

research or field study could be employed to zoom into the students. Online activities at home to explain the findings from current study.

SCOPE OF THE STUDY

Online learning is a wide platform to help students get more educated with the E-learning the concept of learning has differed from the old times. This e-learning platform is widely increased as the each through which, each can access the courses on the websites in minutes. Some report engines like KPMG released their research that, by the year 2021, the count of people who were using the e-learning platforms can reach up to 9.6 million. This figure is huge in number. In order to help learners to get more knowledgeable, The Ministry Human Resource Development (MHRD) is creating more interest to wear with their new courses, certificates, practical's etc.

STATEMENT OF THE PROBLEM

One of the major stumbling blocks with regard to online learning is the lack of strong and stable internet connections. As the ones conventionally used at homes have either low band width or have exhausted their limits. Just the process of logging in for students and teachers alike. Even as upgrading the broadband connection is a prima facie solution, but it certainly isn't fool proof one.

What's really needed for the purpose is a tool that can make logging in a one-time process. There's a need for an app through where in both teachers and students can simply their class/ subject and get going.

RELATIONSHIP BETWEEN OFFLINE CLASSES AND ONLINE CLASSES OF THE SAMPLE RESPONDENTS

Co-efficient Correlation:

To find out the relationship between the Offline Classes and Online Classes of the respondents the researcher is using the statistical tool of Co-efficient Correlation for the calculation the following formula is used,

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

$r = 0.96$

Result:

There is a positive relationship. Therefore the above hypothesis is proved.

Hypothesis:

There is negative impact on online teaching of school students and educators.

FINDINGS

1. Nearly the gender wise respondents are 63.35% increased in boys students.
2. Majorly by the age group 3-5 above of the sample respondents (20.47%).
3. The five types of modem I pad used by lower level of the students.
4. Nearly the usage of application of the app with online classes used by the respondents.
5. The online classes of the students are U.K.G, L.K.G (I to V) standard studied by the respondents.
6. Majority by the online classes per day of the hours.
7. The students are computer subjects in lower level of the online classes.
8. Nearly by effectiveness of online classes 73.22% of the respondents are high level.
9. The interactions during the online classes 6% of the respondents mind disturb of the students lower level.
10. Nearly by the students satisfactions during online classes for completely satisfied level of the high level the students.

SUGGESTIONS

1. The L.K.G, U.K.G students attend the online classes are 11 or 12th students not attend the online classes.
2. The computer system used to a student has a seat.
3. The students zoom in vita Google meet may have met online classes.
4. The V standard students may have access to 45mintutes of online classes
5. The students can put 5 subjects instead of 7 subjects.
6. Net work problem excessive but online classes not attendance.

CONCLUSION

The current study the use of online learning in medical and dental institutes, considering its various advantages. E- Learning modalities encourage student-centered learning and they are easily manageable during this lockdown situation. It is worth considering here that currently online learning is at nascent stage in Pakistan. It started as “emergency remote learning”, and with further investments we can overcome any limitations. There is a need to train faculty on the use of online modalities and developing lesson plan with reduced cognitive load and increased interactivities.

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AUTOMATIC WINDSHIELD WIPER USING SERVOMOTOR AND EMBEDDED MICROCONTROLLER

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ABSTRACT

In today's automotive industry driver's safety is most important so that accidents can be reduced. In many cases, lack of proper vision due to rainfall and manual errors like not increasing the speed of the wiper leads to accident. In this project an automatic rain sensing wiper system has been proposed that detects rain and starts automatically and stops when the rain stops. When the droplets of rain fall on the sensor, the sensor detects the intensity of the rain and increases the speed of the wiper automatically. The higher speed of rotation indicates the higher rainfall. Fludino (Arduino) is used along with a rain sensor, an LCD 16x2 module, and a servo motor. The moisture is measured via analog output pins which are present in the rain sensor, the wiper starts rotating when a threshold of moisture is exceeded. The collected information from the rain sensor is processed and analyzed by Fludino and it further controls the servo motor based on the processed information. The information about the intensity of the rainfall and speed of the wiper is informed to the driver by means of a 4-bit LCD module. All the devices are connected to Floduno which is connected to the power source inside the car.

Key words: Automatic wiper, Floduno, Servomotor, LCD, Water level sensor

1. INTRODUCTION

A windscreen wiper is an essential device that comes pre-installed in almost all motor vehicles including trains, cars, buses, some aircrafts, watercrafts etc. Operation of these wipers in the existing models is yet manual. The physical model of the operation includes two arms twirling at one end back and forth over the glass. The arms have long rubber blade attached. While one end of the arms is attached, the other end pivots. The blade when swung back and forth over the glass pushes water from its surface providing good visibility to driver. The speed of the central shaft is adjustable. A range of several speeds and at least one or more settings that let you set the speed in between are provided. These settings are commonly labeled as "intermittent" settings. To generate the force to accelerate the wiper blades a worm gear is used. The main theme in this project is to develop an automatic rain sensing car wiper

to automatically detect precipitation. It aims to give better visualization to driver without involving the efforts of driver. Floduino board, a rain sensing module, a servo motor and an LCD are the main set of requirements used in the construction of the said system. In this setup, the microcontroller adjusts the speed of the servo motor according to the signal given by the rain sensing module.[1]

2. MATERIALS AND METHODS

2.1 ATMEGA328

ATmega328 is a high-performance Atmel 8-bit AVR RISC-based micro controller. By executing powerful instruction in a single clock cycle, the device achieves throughputs approaching 1MIPS per MHz, balancing power consumption and processing speed.



2.1 ATmega328

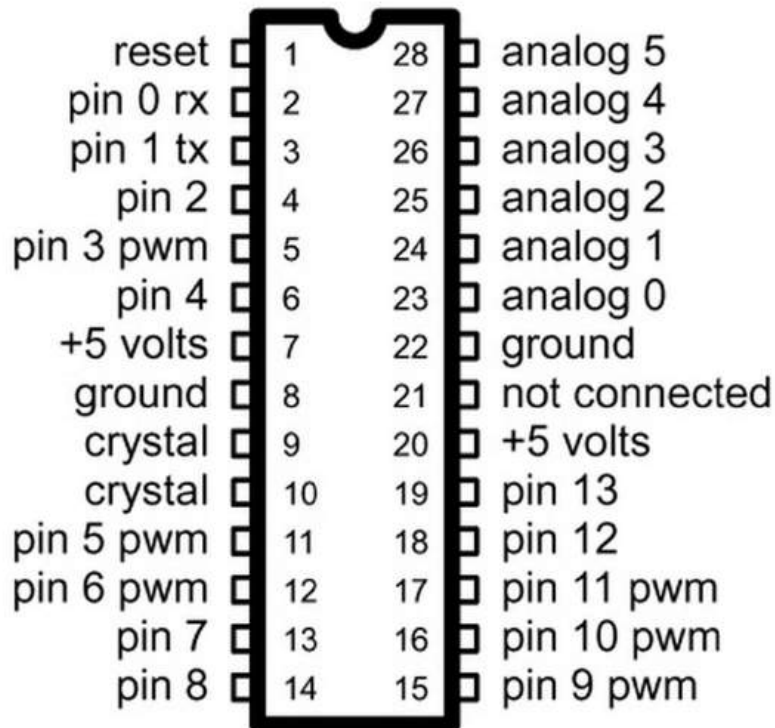
2.1.1 ATmega328 Features

32KB ISP flash memory with read-while-write capabilities, 1KB EEPROM, 2KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages), Programmable Watchdog Timer with internal oscillator, and five software selectable power saving modes. The idle mode stops the CPU while allowing the SRAM, Timers/Counter functioning. This allows very fast start-up combined with low power consumption.

The device is manufactured using Atmel's high density non-volatile memory technology. The on-chip ISP Flash allows the program memory to be reprogrammed In-system through an SPI serial interface, by a conventional non-volatile memory programmer or by an on-chip Boot program running on the AVR core. Atmega328 is a powerful

microcontroller that provides a highly flexible and cost-effective solution to many embedded control applications.[2]

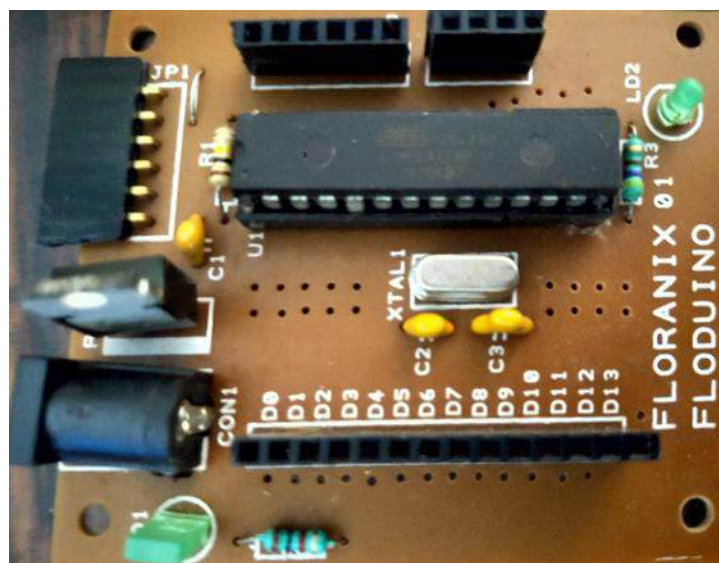
2.2 PIN CONFIGURATION



2.2 Pin Configuration

2.3 FLODUINO

Floduino is a 28-pin microchip with 32k FLASH memory. It uses an embedded micro controller ATmega328.



2.3 Floduino

Embedded C program downloaded from the computer into the flash memory empowers ATmega328 chip to program different specified application. Erasing and reprogramming can be accomplished at ease through the EPROM available inside ATmega328 chip.

2.3.1 Features of Floduino

Microcontroller	ATmega328
Operating voltage	5V
Input voltage(recommended)	7-12V
Input voltage(limits)	6-20V
Digital I/O Pins	14(of which 6 provide PWM output)
Analog Input pins	6

The Floduino can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery.[3]

2.4 SERVOMOTOR

Servo motor is an electrical device which can push or rotate an object with great precision. The position of a servo motor is decided by electrical pulse and its circuitry is placed beside the motor.



2.4 Servomotor

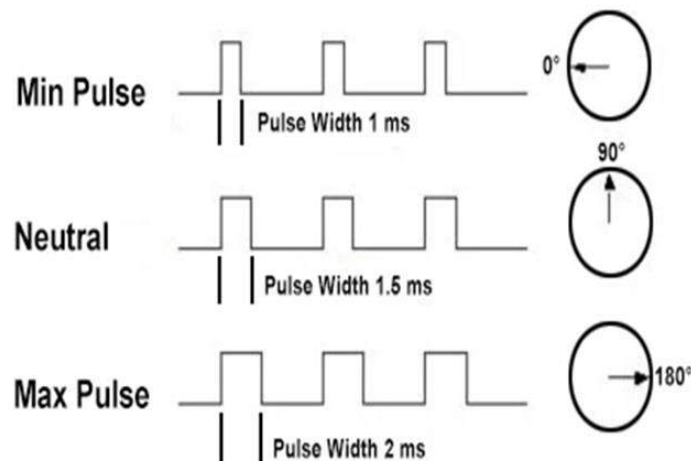
2.4.1 Working of Servomotor

Servo motor works on **PWM (Pulse width modulation) principle** means its angle of rotation is controlled by the duration of applied pulse to its Control PIN. Basically, servo

motor is made up of DC motor which is controlled by a variable resistor (potentiometer) and some gears.[4]

2.4.2 Controlling of Servomotor

The servo motors usually have a revolution cut off from 90° to 180° . A few servo motors also have a revolution cutoff of 360° or more. But servo motors do not rotate constantly. Their rotation is limited between the fixed angles.

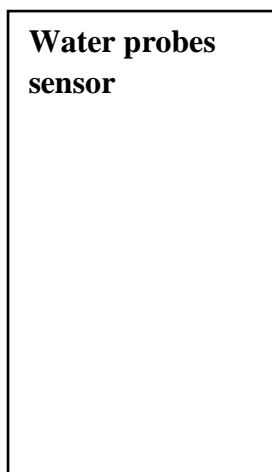


2.5 Controlling of Servomotor

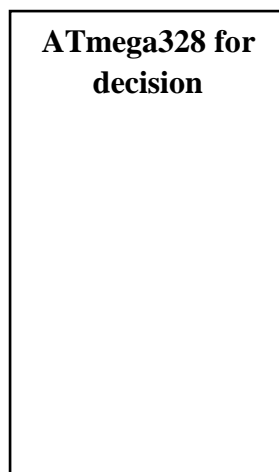
There is a minimum pulse, a maximum pulse and a repetition rate. Servo motor can turn 90° degrees from either direction from its neutral position. The servo motor expects to see a pulse every 20 milliseconds and the length of the pulse will determine how far the motor turns. For example, a 1.5ms pulse will make the motor turn to the 90° position, such as if pulse is shorter than 1.5ms shaft moves to 0° and if it is longer than 1.5ms than it will turn the servo to 180° . [5]

2.5 BLOCK DIAGRAM

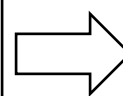
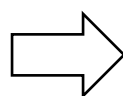
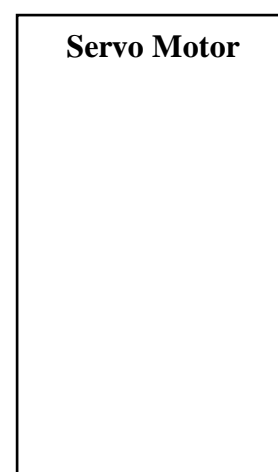
INPUT SECTION SECTION



PROCESSOR SECTION

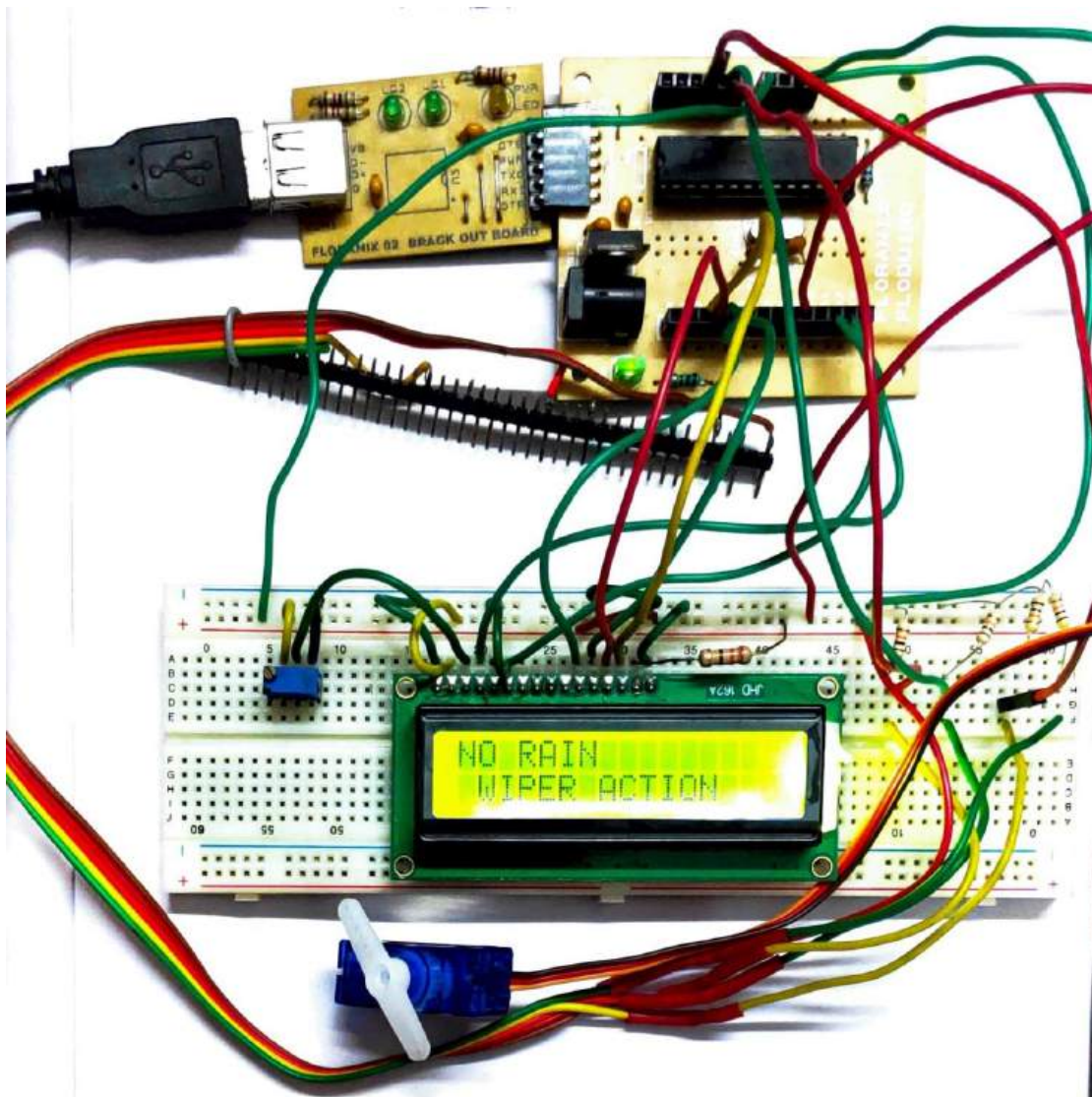


OUTPUT



Implementation

The rain sensing wiper system is constructed using Rain Sensor, Servo motor, LCD module, and Floduino. Whenever the droplets of the rain on the rain sensor, it senses the rainfall and sends Floduino the necessary information for the process to carry on. Floduino is a microcontroller board which is generally an Atemga328. The information sent by the rain sensor is processed by the Floduino and controls the servo motor based on the information processed. The LCD module is to display the information about the speed of the wiper and intensity of the rain. The rain sensor, which senses the rain fall, is placed at the side corner of the windshield outside the car. The wiper blades are connected with the servo motor and are powered by it. LCD module is kept inside the car nearby the driver's vision. The rain sensor, LCD module, and the servo motor are connected with Floduino, which is present in the car connected to a dc source. The speed of the servo motor is increased whenever the intensity rises from low to high. There are four different speeds for the Low rain, Drizzling, Medium and Heavy rain. When the intensity of the rainfall increases, the rotation speed of the wiper will increase automatically. Accordingly, the LCD module displays the information.



2.6 Bread board connection for “Automatic windshield wiper”

Processor Section - The Speed of the Wiper Action decide

The processor sends a trigger pulse to initiate water level probe and reads the count N of the counter when the reflected signal is received. Comparing N with a pre fixed number ‘ N ’, a decision is made to reduce or decrease the speed of the wiper action.

The servo motor is capable of rotating continuously from 0° to 180° clockwise or from 180° to 0° anticlockwise in steps of 1° or in steps of 10° depending upon the PWM signal sent by the microcontroller to the enable pin of the servomotor. If the pulse width is less the servo rotates by 1° only taken more time while for a bigger pulse width the servo rotates in steps of 10° cover the angular distance is a short time. This action is controlled by the library function stored inside the controller. Thus, the instructions are given to the servo motor to rotate

clockwise or anticlockwise either in steps of 1° or in steps of 10° depending upon the value of N received from the ultrasonic sensor section. The PWM command to alter the speed of the wiper in accordance with the intensity of rain is given to enable the pin of the servo motor so as to rotate if faster or slower by the controller.

Output Section - Variation of Speed

The servo motor standing from 0° is made to rotate clockwise up to 180° in steps of 1° and back from 180° to 0° for less rain and the same 'to and fro' operation in steps of 10° heavy rains by the PWM signals from the processor section at its enable pin.

If the shaft rotates through 1° only for every ms, it takes more time to cover 180° and so rotates slowly on the other hand if the shaft jumps through 10° for every ms, it can cover 180° rotation in a shorter time and works faster. Thus, the speed of the wiper action is controlled by the servo motor depending on the intensity of rain.

3. RESULT AND DISCUSSION

The LCD module displays the intensity of rainfall ranging from NO RAIN, DRIZZLING, MODERATE RAIN and HEAVY RAIN. When there is no rainfall, the LCD display will show the intensity of rainfall as NO RAIN. When the rain begins, the rain sensor senses the intensity and sends a signal to the LCD display then the servomotor works accordingly.

S. No	Test Condition	Sensor Action	Output
1	No Water	5V at reference probe	No Rain
2	Water touches probe1	5V at A0	Drizzling
3	Water level reaches probe2	5V shared as 2.5V for A0 and A1	Moderate rain
4	Water level reaches probe3	5V shared as 1.6V for A0, A1 and A3.	Heavy Rain

The automatic car wiper system was developed to sense the rain and wipe the glass by moving the windshield wipers. By using an automatic car wiper system, the purpose of the driver's response to control the wiper is automated. It is demonstrated and proved that the rain sensor's response to the rain for moving the windshield wipers is less than 400 milliseconds. Though the automatic car wiper is designed using a rain sensor and Arduino, it can be advanced by replacing the rain sensors with IR sensors for accurately determining and detecting the rainfall. If you opt for using a wiper which is not only economical but also efficient, using a

rain sensor is the best. To advance the movement and to change the system different sensors which are useful for this purpose can be selected.

4. CONCLUSION

The aim of this project is to provide simple guidelines to the new students and beginners who are interested in floduino. This project makes the new students familiar with the floduino. The working mechanism of it and future aspects of it in a simple and understandable way, brings a little knowledge about the motor's use in the real world, with the help of guidelines and the abundance of resources, it could be very beneficial for people and different sectors of the world depending on the sensors and features required as per necessity. During this period, we learnt about floduino, ultrasonic sensor, motor drive, servo motors and how to program them using floduino. This project gives idea to the new students on different criteria of understanding, knowledge skill.

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CAPSICUM ANNUM PEDICLE DERIVED COBALT OXIDE NANOPARTICLE AND ITS CHARACTERIZATION

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ABSTRACT

The main objective of nanotechnology is to develop and improve every field with nanoparticles which are ultra small in size (1 - 100 nm). Most importantly they exhibit super sensitivity, extraordinary multi-functionality and extremely low power consumption along with high surface to volume ratio. The demand of the nanoparticle is hiked day by day due to the aforementioned properties. At the same time, green synthesis of nanoparticle is focused due to environmental concern. Capsicum annum is known to everyone which is a frequently used vegetable and its pedicle is reknown bio waste especially kitchen waste. So that it is planned to prepare cobalt oxide nanoparticle from the pedicle and to analyze with the help of XRD, FTIR, UV – Vis spectroscopy.

Thus the present work aims in producing cobalt oxide nanoparticles using co-precipitation technique with the help of pedicle of capsicum annum and the above said studies are used to confirm the formation of cobalt oxide nanoparticles as well as to analyze its physical properties.

Key Words: Cobalt Oxide, Nanoparticle, XRD, FTIR, UV

1. INTRODUCTION

Nano science is the study of structures and materials on the scale of nano meters. The term nano originated from the Greek word 'nanos' which means 'dwarf'[1]. The nanoscience deals with materials having at least one spatial dimension in the size range of 1 to 100 nm. Nano materials are expected to have a wide range of applications in various fields such as electronics[2], optical communications[3] and biological systems[4].

The development of novel materials in the nanofield exhibits different propertied compared to bulk materials. In bulk materials, only small percentage of atoms will be near the surface or interface. In nano materials their small size allows many atoms near the interface. Thus their properties such as energy levels, electronic structure, adhesive, reactive and catalytic behaviour are different form bulk materials[5-7].

2. OBJECTIVES OF THE PRESENT WORK

* Synthesis of Cobalt Oxide nanoparticle form Eco - friendly, biowaste material namely pedicle of Capsicum Annum.

* Characterize the prepared material through XRD, FTIR, UV - Vis Spectroscopy.

3. MATERIALS AND METHODS

In this work, pedicle of capsicum annum, cobalt nitrate hexahydrate, sodiumhydroxide were taken for Cobalt Oxide nanoparticle synthesis. Short view about these materials followed by the preparation method is discussed detail in this section.

3.1. CAPSICUM ANNUM



Fig. 3.1. Capsicum Annum

Capsicum is generally used as a food source due to its edible nature. It comes in different colors and thjs has a wide range of nutritional and flavor profiles. Some of the most common types of capsicums include: Red capsicum, yellow capsicum, green capsicum, orange capsicum, purple/black capsicum. These different colors are due to distinct pigments that can attribute a lot of nutrients and antioxidants[8].

3.1. Nutrient values present in Capsicum Annum

S. No.	Nutrients	Value (in 1 cup)
1	Calories	30 Cal
2	Carbohydrate	6.9 gram
3	Dietary fiber	2.5 gram
4	Fat	0.3 gram
5	Protein	1.3 gram

3.2. COBALT NITRATE HEXAHYDRATE

Cobalt Nitrate is the inorganic compound and its most common form is the Cobalt nitrate hexahydrate $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$, which is a red-brown deliquescent salt that is soluble in **water** and other polar solvents. Other names of Cobalt nitrate are Cobaltous nitrate, cobaltous dinitrate. The molecular weight, boiling point and melting point of this material are respectively 291.03 g / Mol, 900°C (1652°F), 835°C (1643°F)[9].



Fig.3.2 Cobalt nitrate hexahydrate

3.3. SODIUM HYDROXIDE

Sodium Hydroxide is a solid ionic compound. It is also known as caustic soda, lye, sodium hydrate or soda lye. In its pure form, it is crystalline solid, colourless in nature. **This compound is highly water-soluble and consists of sodium cations and hydroxide anions.** NaOH absorbs moisture from the air. It is highly corrosive and can cause severe skin burn and irritation to eyes and other body parts. In cosmetics, this inorganic compound is used as a buffering agent. It can also control the PH levels. The PH of sodium hydroxide is 13[10].



Fig .3.3 Sodium hydroxide

3.4. PREPARATION

7.72 g of pedicle of *Capsicum annum* was initially washed, crushed and added with deionized water. Then it was heated at 75°C for ½ an hour. After that the heated solution is filtered using Whatman filter paper. Thus the extract was obtained. 1M $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ solution was added with extract and the entire solution was allowed to stir for ½ an hour. After ½ an hour, 1M NaOH solution is added. With the addition of NaOH solution, immediate formation of precipitate was observed. The synthesized material was thoroughly washed with deionized water. After that the precipitate was dried for overnight at 105°C followed by calcination at 500°C for 3 hours and the sample was collected and grained. At last, 0.83g sample was collected[11].

4. CHARACTERIZATION

The as – synthesized Cobalt Oxide nanoparticle was characterized using XRD, FTIR, UV – Vis Spectroscopy.

4.1. XRD ANALYSIS

Fig 4.1. shows the XRD pattern of the Cobalt Oxide nanoparticle. There are three strong peaks at $2\Theta=31.0287^\circ$, 36.6176° , 65.2252° , which confirm the formation of the Cobalt Oxide nanoparticle. The average grain size of the Cobalt Oxide nanoparticles is calculated from the FWHM values of the diffracted peaks using Debye-Scherrer formula and the values are tabulated here (Table 4.1.). Broad peaks of the obtained XRD spectrum indicate the amorphous nature of the synthesized Cobalt Oxide nanoparticle[12, 13].

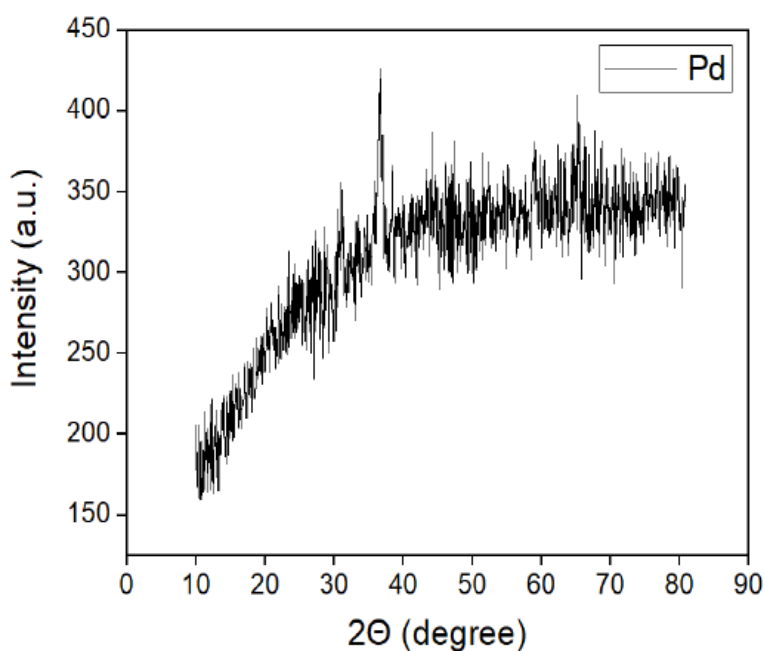


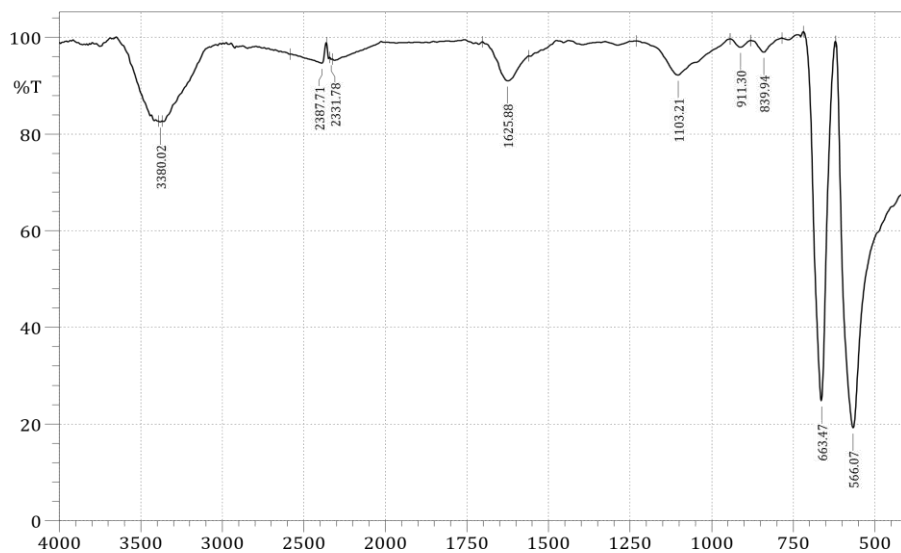
Fig. 4.1. XRD pattern of synthesized Cobalt Oxide nanoparticle

S. No	2θ (degree)	D- spacing	FWHM (degree)	Particle Size (nm)
1.	31.0287	2.88223	0.7872	10.9
2.	36.6176	2.45413	0.5904	14.9
3.	65.2252	1.43043	1.1808	8.38

Table 4.1. Calculated particle size values of the synthesized Cobalt Oxide nanoparticle.

4.2. FTIR ANALYSIS

Fourier transform infrared spectroscopy (FTIR) is a technique used to identify the functional groups present in the synthesized nanoparticle. It has a broad peak located at 3380.02 cm^{-1} which indicates the presence of O-H stretching vibrations. The peaks observed at 2387.71 and 2331.78 cm^{-1} represent the amide C=N functional group. Peak at 1625.85 cm^{-1} attributes the presence of O-H stretching. The peak of value 1103.29 cm^{-1} shows C-O Stretching. The absorption peaks at 663.47 cm^{-1} is assigned to the bridging vibration of Co-O bands (O-Co-O). Peak at 566.07 cm^{-1} indicates the presence of Co-O stretching [14, 15].



Wave number (cm^{-1})

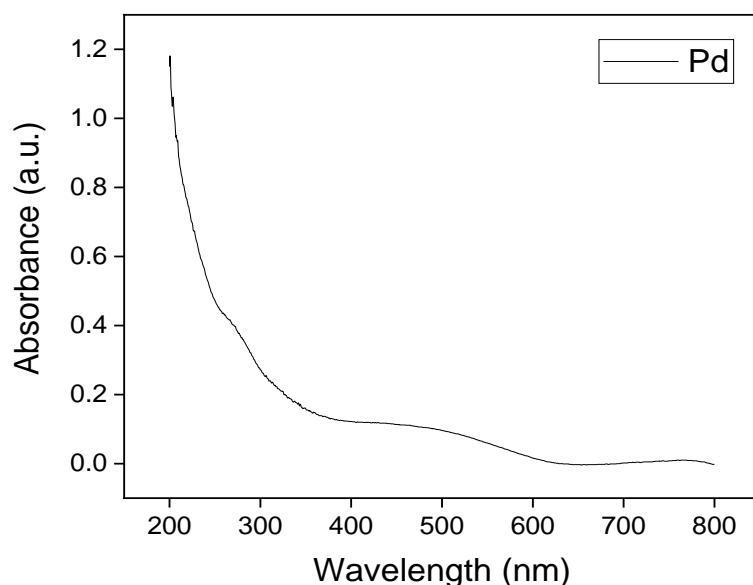
Fig. 4.2. FTIR spectrum of synthesized Cobalt Oxide nanoparticle

S.No	Wavelength(cm^{-1})	Assignments
1.	3380.02	O-H stretching
2.	2387.71	C=N stretching
3.	1625.85	O-H stretching
4.	1103.29	C-O stretching
5.	663.47	Co-O stretching
6.	566.07	Co-O stretching

Table 4.2. FTIR peaks and their corresponding functional group assignments

4.3. UV Analysis

Optical absorption properties of Cobalt Oxide nanoparticle was investigated at room temperature by UV-Vis spectroscopy. Figure 4.3. show the absorbance spectrum of the synthesized sample with two weak, broad absorbance bands. One band is from 250 to 350nm and another is from 400 to 580 nm wavelength. The first band is assigned for $\text{O}^{2-} \rightarrow \text{Co}^{2+}$ charge transfer process while the second one is for $\text{O}^{2-} \rightarrow \text{Co}^{3+}$ charge transfer. Two absorption bands (with peaks values of 273nm, 485.5nm) give two corresponding band gap energy 4.54eV and 2.55eV [6][7]. The calculated E_g values of Co_3O_4 are greater than that of the bulk Co_3O_4 ($E_g = 3.17$ and 1.77 eV). This increase in the band gaps is due to the quantum confinement effects of the Co_3O_4 nanoparticle[16].



1

Fig.4.3. UV – Visible absorption Spectrum

5. CONCLUSION

In this work, capsicum annum pedicle was used in the preparation of Cobalt Oxide nanoparticles via co-precipitation method. The synthesized Cobalt Oxide nanoparticle was finely grounded and collected. The synthesized Cobalt Oxide nanoparticle was characterized through XRD, FTIR, and UV Analysis. The results were interpreted and analyzed. With the help of XRD analysis, the nature of the sample was conformed as amorphous and particles sizes of the sample were found. From FTIR analysis, functional groups of the sample were observed and interpreted. From UV analysis, band gap energy of the Cobalt Oxide nanoparticle was calculated.

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STRUCTURAL AND MORPHOLOGICAL CHARACTERIZATION OF ZINC SELENIDE THIN FILM BY SILAR METHOD

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Abstract

Zinc Selenide (ZnSe) thin films were synthesized at room temperature by (SILAR) method. Zinc Chloride and Selenium Dioxide were used as cationic and anionic precursors for the thin film. ZnSe thin films were grown by optimizing the concentration of cationic and anionic precursors of immersion cycle and immersion time. The crystal structures of thin films were studied by X-Ray Diffractometers. The surface morphology of thin films was studied by Atomic Force Microscopy (AFM) studies.

KEYWORDS: Zinc Selenide thin film, XRD, AFM.

1 INTRODUCTION

Technological progress of contemporary society depends on the fabric science and engineering community's ability to conceive the novel materials with extraordinary combination of physical and mechanical properties [1, 2]. Modern technology requires thin films for various applications. Thin films and its devices play a vital role within the development of contemporary technology. Thin films are three dimensional type of solid material, whose one dimension, called the thickness, is much smaller than the other two dimensions. Thin films are formed by atom to atom or molecule to molecule condensation process [3]. There are many thin film production methods [4]. Physical Vapour Deposition (PVD) and Chemical Vapour Deposition (CVD) are two common varieties of thin-film coating. The physical techniques are vacuum evaporation, sputtering, spraying and painting while vapor deposition, oxidation, immersion plating, chemical bath deposition and electroplating are called chemical techniques. There are various methods to deposit semiconducting thin films like chemical bath deposition (CBD) [5], vacuum evaporation [6], electro deposition [7], chemical vapor deposition [8], molecular beam epitaxy [9], pulsed laser deposition [10], thermal evaporation [11], etc. Among them CBD appears to be very suitable method for an outsized scale fabrication of the semiconducting thin films. In this work zinc selenide (ZnSe) thin film is coated by SILAR method and it is characterized by the subsequent techniques like XRD and AFM.

2 MATERIALS AND METHODS

2.1 Zinc Selenide

Zinc Selenide is an inorganic compound with the formula $ZnSe$ and a relative molecular mass of 144.35. Zinc Selenide ($ZnSe$) may be a light-yellow, solid compound comprising Zinc (Zn) and Selenium (Se). It's an intrinsic semiconductor with a band gap of about 2.7 eV at 25 °C (77 °F). $ZnSe$ may be made in both hexagonal and cubic crystal structure. It's a wide-band gap semiconductor of the II-VI semiconductor group.

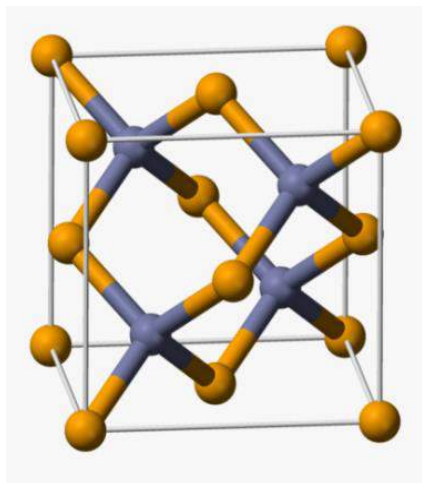


Fig 2.1 Structure of Zinc Selenide

Thin films of $ZnSe$ have been deposited using molecular beam epitaxy, electron beam evaporation, chemical deposition, electro deposition, vacuum evaporation, successive ionic layer adsorption and reaction (SILAR) technique [12–16]. The $ZnSe$ thin films have various applications in

- Light emitting diodes and laser diodes.
- Manufacturing lenses for high power IR laser [17].
- Luminescent devices [18].

2.2 Zinc Chloride

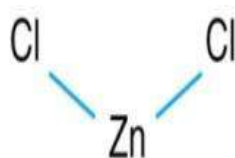


Fig 2.2 Structure of Zinc Chloride

2.3 Selenium Dioxide

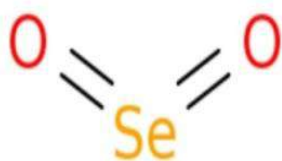


Fig 2.3 Structure of Selenium Dioxide

2.4 Silar Method

ZnSe thin films were prepared by SILAR method using glass substrates. The preparative parameters used for the deposition of ZnSe thin films are summarized in table 2.4. Before deposition substrates were cleaned in distilled water, and then in acetone. Later they were rinsed with double distilled water. For this deposition, cationic precursor used was zinc chloride and anionic precursor was selenium dioxide. Well cleaned glass substrates were dipped into an aqueous solution of Zinc Chloride. The surface of the substrate was adsorbed by zinc ions. Then substrate was rinsed by double distilled water for the expulsion of loosely bound Zn^{2+} ions. Next to this, the substrates were dipped into aqueous solution of selenium dioxide. The selenium dioxide mixed with adsorbed zinc ions. Finally, to avoid precipitation the substrates were rinsed with distilled water. This is the growth cycle of SILAR method. To obtain desired thickness of the films, these growth cycles have been replicated.

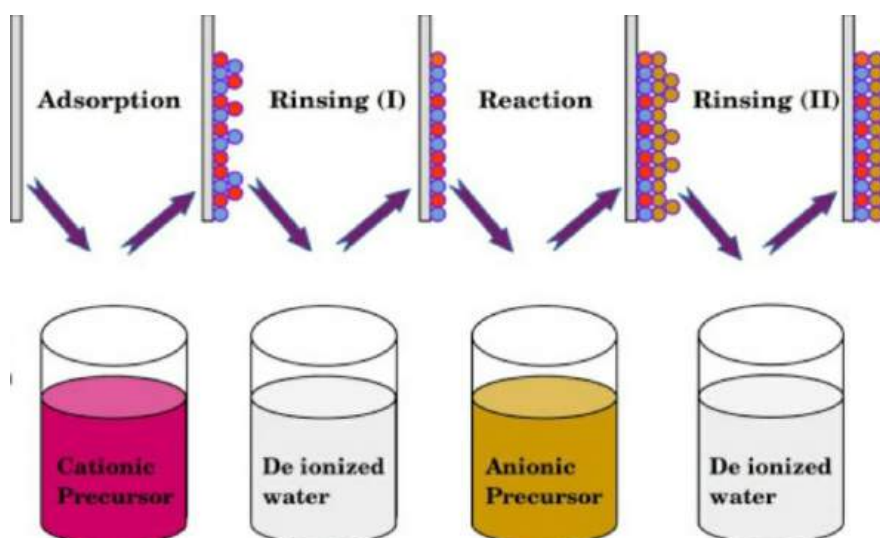


Fig 2.4 Schematic representation of SILAR method

S.No	Parameters	Cation Solution	Anion Solution
1	Materials	Zinc Chloride	Selenium Dioxide
2	Concentration of solution	0.1	0.1
3	Solution temperature	Room temperature	Room temperature
4	Immersion time	5 sec	5 sec
5	Total number of deposition cycles	300	300

Table 2.4 ZnSe thin film synthesis parameters

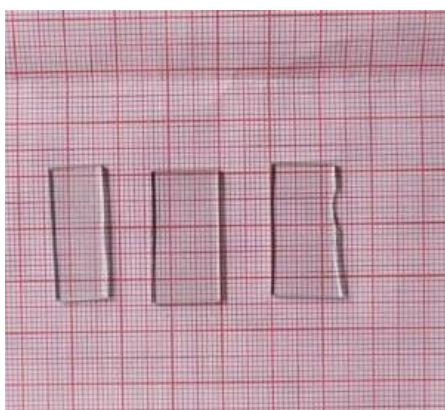


Fig 2.5 Zinc Selenide Thin Film

3 RESULTS AND DISCUSSION

3.1 XRD Pattern of ZnSe Prepared By SILAR Method

To study structural properties of the deposited ZnSe thin films, X-ray diffraction (XRD) study was carried. The XRD pattern for the ZnSe thin films was obtained at different peaks at $2\theta = 74.880$ along the (420) hkl plane, 65.908 along the (400) hkl plane, 31.530 along the (200) plane and 27.0707 along the (111) plane presented in the table 5. All diffraction Peaks of the ZnSe thin films correspond to the characteristic cubic structure of ZnSe thin film.

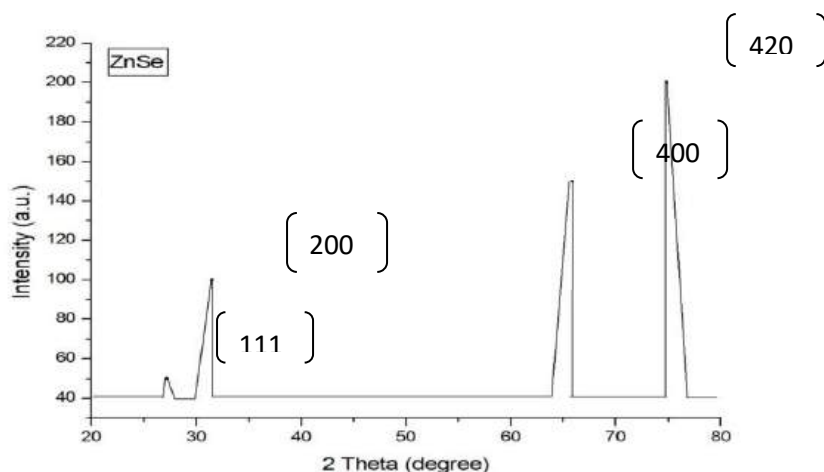


Fig 3.1 XRD pattern of ZnSe thin film

The atom types and positions determine the diffraction peak intensities. The crystal structure describes the atomic arrangement of the film. The observed 'd' values are compared with standard 'd' values using joint Committee on Powder Diffraction Standards (JCPDS) diffraction file or American Society for Testing Materials (ASTM) data card no.(05-0522) for the identical material synthesized by standard chemical methods. Using Fig 3.1 structural properties of the deposited film were analysed, further analysis of XRD studies had been done. The crystallite size of thin film was calculated from XRD patterns by using Scherrer's formula given below

$$D = k\lambda / \beta \cos \Theta$$

Where,

D = Crystallite size

K= Constant

β = Corrected FWHM of the most intense peak

Θ = Bragg's angle

The dislocation density has been calculated using crystallite size, by the equation

$$\text{Dislocation} = 1/D^2$$

The microstrain has been calculated by the given formula,

$$\text{Microstrain} = \beta \cos \Theta / 4$$

The grain size, dislocation density and micro strain of ZnSe thin film are given below. It is observed that as the grain size increases microstrain will decrease.

Table 3.1 Structural parameters of ZnSe thin film

hkl	2 θ (degree)	Grain size (D) nm	Dislocation density (lines/m²)	Microstrain
111	27.223	1.4863	0.4526	0.1153
200	31.530	0.8631	1.3423	0.1323
400	65.908	0.3557	7.9037	0.2410
420	74.880	0.2644	14.3046	0.2592

3.2 AFM (Atomic Force Microscopy)

AFM allows us to get microscopic information of the surface structure and to plot topographies representing the surface of the deposited zinc selenide thin film. AFM images of zinc selenide thin film is presented in fig7. As deposited zinc selenide thin film reveal smooth surface with pyramid like structures and high degree of homogeneity. The coalescence of grains of zinc selenide thin film resulting in bigger grains is clearly observed in AFM images. This technique offers digital images which allow quantitative measurements of surface features such as root mean square roughness, Ra or average roughness and the analysis of images from perspectives including three dimensional simulations of zinc selenide. The average surface roughness, maximum peak height and root mean square of the zinc selenide thin films were calculated and the values are tabulated below in table 3.2.

Substrate	Surface roughness (Sa)	Root mean square (Sq)	Maximum peak height (Sp)
ZnSe	6.306 nm	7.724 nm	22.258 nm

Table 3.2 Surface roughness, maximum peak height and root mean square of ZnSe thin film

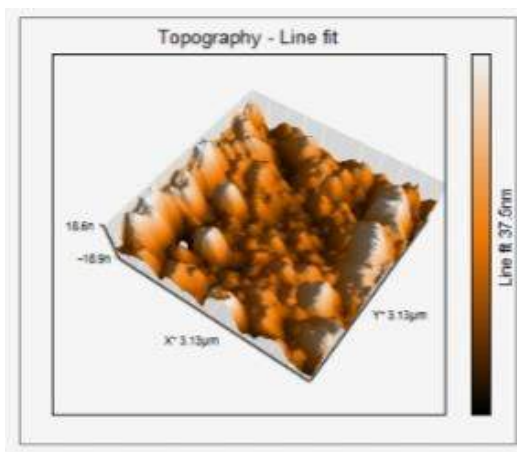


Fig 3.2 AFM images of ZnSe

4 CONCLUSIONS

In this project ZnSe thin films were prepared by SILAR method and was characterized by various studied such as XRD and AFM.

The synthesized films were characterized by XRD. The grain size of ZnSe was calculated by Debye-Scherrer's formula. ZnSe thin film showed cubic structure. The average grain size of the thin film is about 0.7424 nm. The miller indices values well agree with the JCPDS files.

The surface morphology is measured by Atomic Force Microscope. AFM reveal smooth surface with pyramid like structures and high degree of homogeneity.

It can be used as a protective optical window in FLIR (forward looking infrared) thermal imaging equipment for medical and industrial applications.

Hence, In future optical and thermal studies will be carried out.

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AN ASSESSMENT OF LEAD REMOVAL FROM CONTAMINATED WATER USING SOLID BIOMATERIALS

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Abstract

The present study has been carried out to analyse the absorption property of various biodegradable wastes such as fish bone, sea weed and sugarcane bagasse. The lead biosorption was studied by using biomaterials (fish bone, sea weed and sugarcane bagasse). Fish bone, sea weed and sugarcane bagasse were exposed to lead nitrate solution and agitated for 48 hrs on shaker at room temperature. The supernatant was analyzed for lead concentration using atomic absorption spectrophotometer (AAS). The results of all the samples were compared with a the control lead solution. The data showed that among all the substrates sea weed-1 had the highest percent of lead removal from contaminated water (96.79%) followed by fish bone B:2- 96.17%, sea weed-2 - 96%, fish bone A-1 - 95%, fish boneA-2 -94.90%, fish bone B-1-94.55%, sugar cane bagasse-1 - 92.59%, sugarcane bagasse -2 remove 86.95% of lead respectively. The results of the present study clearly demonstrate that all the solid substrates (fish bone, sea weed, and sugarcane bagasse) have great ability to remove lead from contaminated water.

Keywords : Fishbone, Sea weed, Sugarcane bagasse, Atomic Absorption Spectrometer.

Introduction

Environmental pollution is presently one of the major important issues due to undesirable effects of industrialization, urbanization, population growth and human attitude towards the environment. The trend of environmental pollution is so fast and vast that the detectable rates of contamination are even encountered in the farthest ocean waters. Based on the estimations made by the environmental protection agency only around 10% of all wastes were safely disposed off ^[1]. The world is becoming a global village, thus heavy metal contamination in one region will inherently have global consequences. Heavy metal pollution in the aquatic system has become a serious threat today and a great environmental concern as they are non-biodegradable and thus persistent.

Heavy metals include lead, chromium, mercury, uranium, selenium, zinc, arsenic, cadmium, silver, gold, and nickel ^[2]. Among heavy metals, lead has been recognized as one

of the most toxic metals, mainly in its ionic state. Due to its high toxicity, lead is harmful when it accumulates in the tissues of living species. Lead acts as an enzyme inhibitor in cell tissues and, therefore, is considered a metabolic poison. Damage to kidneys, nervous system, reproductive system, liver, and brain are the major effects on the human body [3].

In order to reduce heavy metal pollution, the process of adsorption is used. Adsorption is a technology for removing pollutants from environment thus restoring the original natural surrounding and preventing further pollution [4]. Varieties of agricultural waste used as adsorbent like wool, rice, straw, coconut husks, peat moss, tired coffee, waste tea, rice hulls, cork biomass, seeds of *Ocimum basilicum*, coconut shells, soybean hulls, cotton seed hulls, saw dust of walnut, untreated coffee dust [5], papaya wood, sea weed [6], peanut hulls and citrus peel, sugarcane bagasse were used as adsorbents for removal of metals. Fish bone has become an alternative cheap and abundant waste for in-situ lead stabilization from contaminated water. Most of the research using fish bone reported are chemically modified, activated fish bones or condition.

Heavy metals even at low concentrations can cause toxicity to humans and other forms of life, its adverse effects on human health. The toxicity of metal ion is owing to their ability to bind with protein molecules and prevent replication of DNA and thus subsequent cell division [7]. To avoid health hazard, it is essential to remove these toxic heavy metals from waste water before its disposal. Therefore, the present study has been carried out to remove the lead from the contaminated solution using solid substrates such as fish bone, shell, sea weed, sugar cane bagasse, without modification and at neutral pH.

MATERIALS AND METHODS

PREPARATION OF LEAD NITRATE SOLUTION (1300ppm)

Using an analytical balance, 1.3 g of lead nitrate was dissolved in de-ionized water (added incrementally) to give 1000 ml solution. Then a stirring bar was dropped onto the volumetric flask and the mixture was stirred until all the lead was completely dissolved. The flask was wrapped with aluminium foil to avoid much exposure to light while the solution continued to stir at room temperature until it was used.

PREPARATION OF FISH BONE SUBSTRATES

Sardinella brachysoma and *Thryssa malabarica* were bought from a local market, deboned after soaking in water at room temperature for 3 hrs. The bones were washed with de ionized water and dried in an oven at 50⁰C for 24 hrs. The dried bones were pulverized using a blender. Two different grade particles sizes were obtained. Sample 1 (FB- A1, FB- B1) is fine

powder and sample 2 (FB- A2, FB- B2) is coarse powder. Four 150 ml conical flask were charged with 4.0 g of the fishbone.

PREPARATION OF SEA WEED SUBSTRATES

The seaweed (*Sargassum*) were collected from the coast of Thoothukudi and were washed thoroughly with distilled water, dried in sun and ground to powder. Two different grade particles sizes were obtained. Sample 1 is fine powder and sample 2 is coarse powder. Two 150ml conical flask charged with 4.0 g of the powered sea weed and labelled as SW.

PREPARATION OF SUGARCANE BAGASSE SUBSTRATES

Sugarcane bagasse was procured from a local vendor. The bagasse was cut into pieces and kept in a hot air oven to remove the water content. The bagasse was then powdered using a grinder. Dried, powdered sugar cane bagasse was sieved to obtained uniform sized particles. Two different grade particles sizes were obtain (fine powder and coarse powder). Two 150 ml conical flask charged with 4.0 g of sugar cane bagasse and labelled as SB.

REACTION OF THE SUBSTRATES WITH LEAD

Into each of the respective two conical flask containing the substrates was added 50 ml of 1300 ppm of lead nitrate solution prepared above. The flask and their contents were vortexed, secured tightly on KEMI Heavy Duty Shaker, and agitated for 48 hrs at room temperature.

SAMPLE PREPARATION AND ANALYSIS

After 48 hrs, the shaker was stopped and the flasks were removed from the shaker. The samples were transferred into the centrifuge tube and centrifuged at 3000 rpm for 10 minutes. The resulting supernatant in each tube was transferred into another labelled clean test tube. All the labelled tubes with their liquid contents were sent to Ayya Nadar Janaki Ammal College Instrumentation Centre for lead analysis using Atomic Absorption Spectrometer (AAS).

The lead concentration (in ppm) in each of the test tube was analyzed:

- | | | |
|---|---|---------------|
| Control | - | Lead solution |
| 1) Fish bone (<i>Sardinella brachysoma</i>) | - | FB-A |
| 2) Fish bone (<i>Thryssa malabarica</i>) | - | FB-B |
| 3) Sea weed (<i>Sargassum sps</i>) | - | SW |
| 4) Sugar cane bagasse | - | SB |

ADSORPTION CAPACITY

The adsorption capacity for each substrate was calculated by (Kizilkaya *et al.*, 2014)^[8] using the equation

$$q = (V_L/W_g) (C_i - C_f) \text{ Where } q = \text{adsorption capacity}$$

V_L = Volume of aqueous lead solution used in litres

W_g = mass of adsorbent (substrate) in grams

C_i = initial lead ion concentration in mg/L

C_f = final lead ion concentration after 48 hrs of adsorption time in mg/L.



Sardinella brachysoma (Fish bone A) *Thyssa malabarica* (Fish bone B)



Fish bone A- Fine powder



Fish bone A- Coarse powder



Fish bone B- Fine powder



Fish bone B- Coarse powder



Seaweed- Fine powder



Seaweed- Coarse powder



Sugarcane bagasse –Fine powder



Sugarcane bagasse- Coarse powder

Fig 1: Solid biomaterials

RESULTS

The results of the present study clearly demonstrate that all the solid substrates namely fish bone, sea weed, and sugarcane bagasse (Fig 1) have great ability to remove lead from contaminated water. Table-1 shows residual lead in ppm in each reaction tube after contaminated water was treated with each extract for 48 hours and the percent lead removed was compared to the control. sea weed-1 remove 96.79%, fish bone B-2 remove 96.17%, sea weed-2 remove 96%, fish bone A-1 remove 95%, fish boneA-2 remove 94.90%, fish bone B-1 remove 94.55%, sugar cane bagasse-1 remove 92.59%, sugarcane bagasse -2 remove 86.95% of lead respectively.

The result of the preset study shows that among all the substrates sea weed sample-1 had the highest percent of lead removal from contaminated water (96.79%). Figure 2 and Figure 3 show the amount of lead remaining in the reaction mixture after fish bone, sea weed, and sugarcane bagasse were agitated with lead solution and the percent of lead removed. Sea weed -1 and fish bone B-2 have unusually great ability to remove lead from contaminated water. However, sea weed-2 had a modest ability to remove lead from contaminated aqueous solution. Fine powder sample removed more metals than coarse sample except fishbone B2.

TABLE: 1- RESIDUAL AND REMOVAL LEAD IN CONTAMINATE WATER AFTER TREATED WITH SUBSTRATES

Sample	Lead Content in ppm	Amount of Lead Removed	% of Lead Removed
Control	1299.68	0.32	0.024
Fish Bone A-1 (fine)	59.6429	1240.35	95.45
Fish Bone A-2 (coarse)	66.1813	1233.9	94.90
Fish Bone B-1 (fine)	70.8648	1229.13	94.55

Fish Bone B-2 (coarse)	49.8122	1250.18	96.17
Sea weed-1 (fine)	41.6045	1258.39	96.79
Sea weed-2 (coarse)	45.8706	1254.2	96.8
Sugarcane bagasse-1 (fine)	96.2764	1203.72	92.59
Sugarcane bagasse-2(coarse)	169.6360	1130.36	86.95

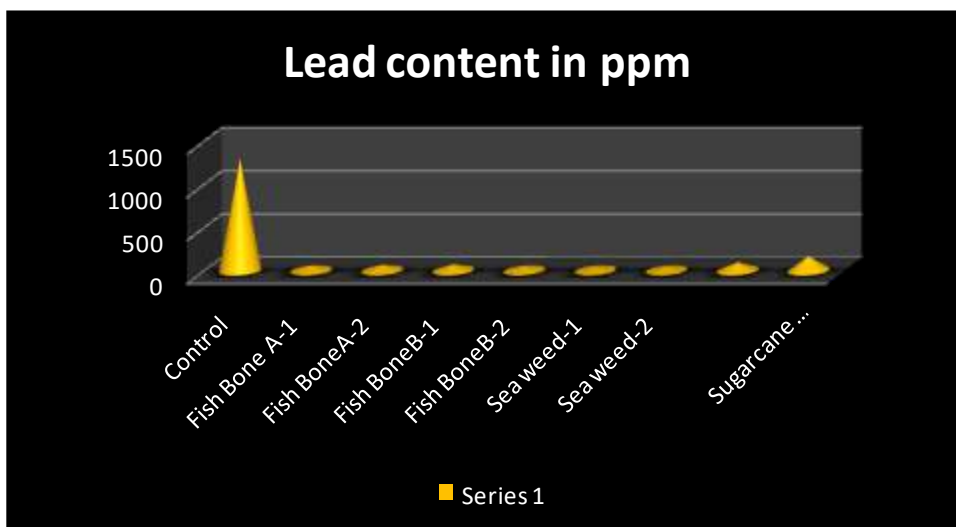


Fig. 2. Residual concentration after lead solution was treated with substrates for 48 hrs

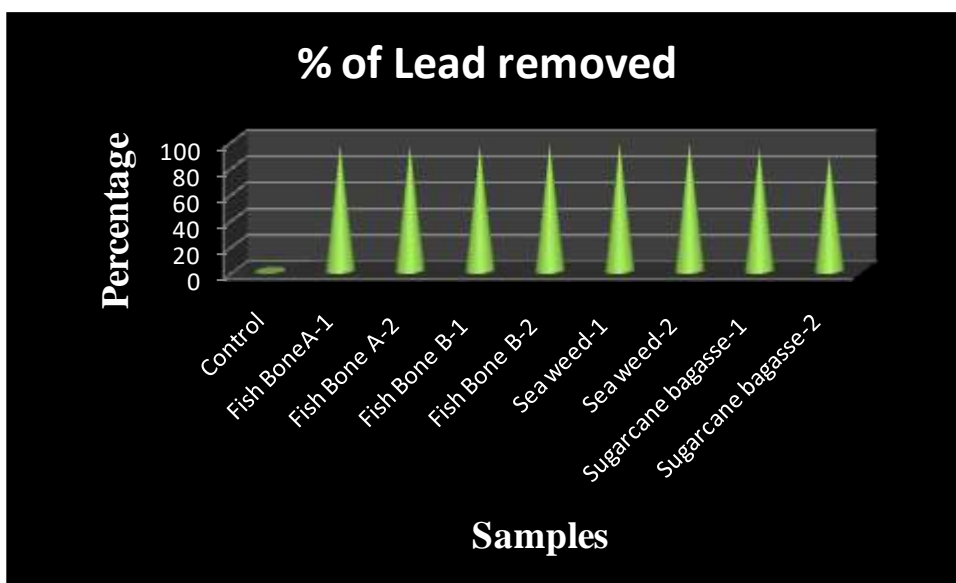


Fig. 3. Percentage of Lead removed by the samples

DISCUSSION

The results of the present study shows that all the solid substrates (fish bone, sea weed, and sugarcane bagasse) have great ability to remove lead from contaminated water. Among all the substrates sea weed sample-1 had the highest percent of lead removal from contaminated water (96.79%). (Jalali *et al.*,2001)^[9] reported that removal of lead from *Sargassum* biomass was successfully achieved by eluting with 0.1 M HNO₃ for 15 min and a high degree of metal recovery was observed (95%).

Metals most effectively stabilized by fish bones are lead, zinc, copper, cadmium, nickel, uranium, barium, caesium, strontium, plutonium, thorium and mostly other lanthanides and actinides. Fish bone A-1, fish bone A-2, fish bone B-1 and fish bone B-2 removed 95.45%, 94.90%, 94.55% and 96.17% of lead respectively (Table 1). This results are in agreement with the report of (Ozawa and Kanahare, 2005)^[10]. 99% of lead was removed when lead solution was exposed to fishbone heated at 600°C for activation and fish bones were compared to those of sodium phosphate and sodium carbonate, fish bones are more effective in lead removal than carbonate (97%) or phosphate (96%). Fish bones and agricultural wastes are a commodity that is available in large amounts, are relatively inexpensive, and can be easily transported by truck or rail to the final destination. Fine powder sample removed more metals than coarse sample except fishbone B2. Lager size have greater surface area which absorb and adsorb more metal.

Sugar cane bagasse-1 remove 92.59%, of lead and sugarcane bagasse -2 remove 86.95% of lead respectively. But in contrast Joseph *et al.*, (2009)^[11] studied the anaerobic degradation of sugarcane bagasse, the production of biogas and the subsequent implementation of digested sugarcane bagasse for the adsorption of heavy metals. They observed that the anaerobic incubation of raw sugarcane bagasse led to an increase in its metal ion adsorption capacities, which were 2.0 and 2.3 times higher for Zn(II) and Cd(II), respectively.

CONCLUSION

The emerging recent studies in molecular biology and ecology offers opportunities for more efficient biological processes to detoxify contaminants. Bioremediation is far less expensive than other technologies that are often used to clean up hazardous waste. Bioremediation is an option that offers the possibility to destroy or render harmless various contaminants using natural biological activity. As such, it uses relatively low-cost, low-

technological techniques, which generally have a high public acceptance and can often be carried out on site. Although the methodologies employed are not technically complex, considerable experience and expertise may be required to design and implement a successful bioremediation program, due to the need to thoroughly assess a site for suitability and to optimize conditions to achieve a satisfactory result. Since bioremediation seems to be a good alternative to conventional clean-up technologies, research in this field has to be explored with advanced innovations.

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**EXPLORING THE CRAB BIODIVERSITY AND HEAVY
METAL ANALYSIS OF *PORTUNUS SANGUINOLENTUS* FROM
GULF OF MANNAR**

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Abstract

Coastal environment provides a greater range of habitats and thus potentially supports greater biodiversity. The checklist of brachyuran crabs studied from 5 stations namely., Vellapetti, Vembar, Threspuram, Manapad and Kootapuli of Gulf of Mannar, South east coast. Moreover those 5 regions were taken for diversity study. Totally 14 individual crab species were recorded belonging to 6 families from these landing centres. The maximum crabs were recorded, belonging to the family Portunidae than other families. Among these five landing centres, the maximum diversity has been observed on Kootapuli and the least diversity of brachyuran crabs has been documented from Threspuram. The crab families viz. Portunidae, Cancridae and Calappidae were obtained in almost all stations. Crabs are collected plenty during monsoon and post-monsoon than pre-monsoon and summer. Gulf of Mannar in South India is receiving effluents containing heavy metal pollutants. Thoothukudi waters are affected by industrialization in the past few years. In the present study the heavy metal concentration in the shell and tissues of Portunidae Sanguinolentus was also analysed from Thoothukudi coast. Three metals were recorded, among them, cadmium (Tissue: 0.64%, Shell: 0.84%) shows high concentrations then lead (Tissue: 0.59%, Shell: 0.17%) and copper (Tissue: 0.43%, Shell: 0.59%) by Atomic Absorption Spectrophotometer.

Key words: Brachyuran crabs, Portunus sanguinolentus, Portunidae, Cancridae, Calappidae, Atomic Absorption Spectrophotometer

INTRODUCTION

The biodiversity is important for human survival and economic interests and for the environmental purpose and stability. Crustaceans are visibly a remarkable group of organisms with a long evolutionary history and prominent adaptability^{[1][2]}.

Crabs are one of the economically important faunal communities in the marine ecosystem. Many of the crabs are commercially important as a food source for people. The majority of crab species belong to the order brachyuran, which means “short tails”.

Brachyuran crabs are most diverse groups of crustaceans alive today, they are found at even 6000m depths to sea shore and dominant in marine habitat^[3].

There are about 6,793 species of crabs found on all of the oceans around the world. Out of which, about 640 species of marine crabs are so far recorded from Indian waters and only 15 species are edible^{[4][5]}. Moreover, 404 species belonging to 26 families and 152 genera from the Tamilnadu South-eastern coast^[6]. The Gulf of Mannar National Reserve harbours 106 species of crab. *Portunus pelagicus* along with *P.sanguinolentus* and *Charybdis feratius* constitute up to 90% of the crab landings in India^[7].

Heavy metal pollutions are particularly hazardous contaminants in food and environment. In general they are not biodegradable and have long biological half-lives, and they result in bioaccumulation and biomagnifications in the food chains^[8]. Metals are natural components of the aquatic environment, but their levels have increased due to anthropogenic activities. The concentrations of heavy metals were found to rise in coastal ecosystem due to release of industrial waste, agricultural and mining activities in recent years^[9].

Heavy metals such as Hg, Cu, Zn, Cd, Pb are discharged frequently through industrial and domestic effluents along the south east coast of india boarding Tamilnadu State^[10].

The deposition of acids also causes an increased level of metals in the soil, and contributes to increased level of metals in surface waters^[11].

As nutritionally beneficial as crustaceans and molluscs are potential sources of health risks to man due to accumulation of toxic heavy metals (HMS) such as lead (Pb) and cadmium (Cd). At a certain trace amount Pb and Cd are toxic to biological systems. Lead is capable of causing both acute and chronic toxicities.

MATERIALS AND METHODS:

Study area

Gulf of Mannar covers approximately an area of 10,500 sq.km along 8°35'N - 9°25'N latitude and 78°08'E - 79°30'E longitude. Gulf of Mannar situated in a southeastern coast of India extending from Rameshwaram in the north to Thoothukudi in the south along with its marine environment has been declared as India's first Marine Biosphere Reserve. In the present study, the crabs were collected from five stations in and around Thoothukudi located at the southern part of Gulf of Mannar Biosphere Reserve. Crabs are collected from the following stations- Vellpetti, Vembar, Threspuram, Manapad, and Kootapuli.

Collection of sample

The crabs for the present work, were observed and recorded from the 5 stations at Gulf of Mannar coastal areas during November 2021 to April 2022. The specimens of the crab (*Portunus sanguinolentus*) were collected from the fish landing centre harbour Thoothukudi. Immediately after collection, the fresh samples were kept in an ice box and transported to the laboratory and stored in a deep freezer at -20 degree until they are used.

Heavy metal analysis

All the glasswares used for the analysis were soaked in 5n nitric acid and thoroughly washed with distilled water. All the reagents used were BDH (Analar grade). Nitric acid digestion distilled water was used for the chemical analysis. Nitric acid digestion was employed to analyse heavy metal concentration in samples^[12].

Preparation of sample extracts

The shells and tissues were broken and they were removed and washed thoroughly with distilled water and dried in sunlight after that shells and tissues were prepared in powder in powder form. Approximately 10g of shell and tissue powders were immersed separately into methanol solvents and they were cold steeped at -18°C. The extracts from each solvent were filtered twice using whatman No.1 filter paper. Samples were centrifuged 15 min in rotary evaporator and the precipitate was collected and it was stored at refrigerator for further use.

Animal sample

The ice preserved organisms were sorted out, washed in distilled. In three-spotted crab (*Portunus sanguinolentus*), was used for the shell analysis of heavy metals excluding the tissues. The shells were taken, washed in distilled water and oven dried at 80°C + 1°C for 24 hours. Then dried shells were powdered using a mortar and pestle and weighted accurately, 500mg in a precision balance in triplicates and transferred to digestion flasks. It is digested with 9ml concentrated nitric acid and 1 ml of chloric acid. The sample was heated by keeping on a hot plate until the evaporation of the samples. Care was taken to avoid charring during the digestion process. When the solution became near dryness, added a small quantity of double distilled water along the sides of the flask and rinsed the flask. Filter the solution through Whatmann No:1 filter paper into 25ml volumetric flask and made up the solution to 25ml using crystal clear double distilled water. Blank solution was also prepared in the same way with the reagents but without sample material. The prepared samples were transferred to GENS, Polythene bottles and were analysed for various metals on Atomic Absorption Spectrophotometer (AA SELICO SD194).

RESULTS AND DISCUSSION

Totally 14 species of crab were collected from the study area, of this 9 were edible and 5 were non edible. In the present study, totally 14 crabs were recorded belonging to six families. Maximum crab species were recorded in the present study was belonging to Family Portunidae than other families and also maximum 13 species recorded in Kootapuli (Station 5) and minimum 5 Species recorded in Threspuram (Station 2)(Table 1). The observation of crabs at 5 stations were recorded and the common edible crabs of family Portunidae, occur in great abundance along the entire coast. Among them, Charybid species, *Portunus pelagicus* and *Portunus sanguinolentus* are of special importance and abundant throughout the year. Maximum crabs were collected during post-monsoon and monsoon than pre-monsoon and summer. The crab belonging to families viz., Portunidae, Cancridae, Calappidae, Xanthidae, Epialtidae, Ocypodidae were obtained almost all seasons.

Systematic account of crab fauna

The different species of crab collected during the study period (Nov 2021- April 2022) were identified and are shown in Table-1. The availability of crabs in different seasons were identified and are shown in Table-2.

Table-1: checklist of crab species recorded during the study in different stations

S.No	Species Name	Family	Stations				
			1	2	3	4	5
1.	<i>Portunus pelagicus</i>	<i>Portunidae</i>	+	+	+	+	+
2.	<i>Portunus sanguinolentus</i>		+	+	+	+	+
3.	<i>Necora puber</i>		-	-	+	-	-
4.	<i>Scylla serrata</i>		+	+	+	+	+
5.	<i>Charybids natator</i>		+	-	-	-	+
6.	<i>Charybids feratius</i>		+	-	+	+	+
7.	<i>Charybids callianassa</i>		-	-	-	-	+
8.	<i>Charybids helleri</i>		-	-	-	-	+
9.	<i>Cancer productus</i>	<i>Cancridae</i>	+	+	+	+	+
10.	<i>Calappa calappa</i>	<i>Calappidae</i>	+	+	+	+	+
11.	<i>Atergatis intergerrimus</i>	<i>Xanthidae</i>	-	-	-	+	+
12.	<i>Leptodius exaratus</i>		-	-	-	-	+
13.	<i>Libinia emarginata</i>	<i>Epialtidae</i>	-	-	-	-	+
14.	<i>Ocypode quadrata</i>	<i>Ocypodidae</i>	-	-	-	-	+

Table-2: Abundance of crabs in different seasons

S.No	Species Name	Pre-Monsoon					Monsoon					Post-Monsoon					Summer				
		S1	S2	S3	S4	S5	S1	S2	S3	S4	S5	S1	S2	S3	S4	S5	S1	S2	S3	S4	S5
1.	<i>Portunus pelagicus</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2.	<i>Portunus sanguinolentus</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
3.	<i>Necora puber</i>	-	-	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+	-	-
4.	<i>Scylla serrata</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5.	<i>Charybids natator</i>	+	-	-	-	+	+	-	-	-	+	+	-	-	-	+	+	-	-	-	+
6.	<i>Charybids feratius</i>	+	-	+	+	+	+	-	+	+	+	+	-	+	+	+	+	-	+	+	+
7.	<i>Charybids callianassa</i>	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+
8.	<i>Charybids helleri</i>	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+
9.	<i>Cancer productus</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
10.	<i>Calappa calappa</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
11.	<i>Atergatis intergerrimus</i>	-	-	-	+	+	-	-	-	+	+	-	-	-	+	+	-	-	-	+	+
12.	<i>Leptodius exaratus</i>	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+
13.	<i>Libinia emarginata</i>	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+
14.	<i>Ocypode quadrata</i>	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+

Station 1- Vellapetti; Station 2- Threspuram; Station 3- Vembar; Station 4- Manapad

Station 5- Kootapuli

Heavy metal

A major reason to monitor the level of toxic metals in the given sample is to prove that the contamination of the general environment has increased. Thoothukudi coast is affected by industrialization in the past few years. The effluent discharges from industries, chemical plants and untreated sewage are the main source of heavy metals pollution along

Thoothukudi coastal waters. Three metals were recorded, among them, cadmium (Tissue:0.64%, Shell:0.54%) shows high concentration than lead (Tissue: 0.59%, Shell: 0.17%) and copper (Tissue: 0.43%, Shell: 0.59%) by Atomic Absorption Spectrophotometer.

Copper is a micronutrient for aquatic life but it becomes toxic at higher level. In the present study, the maximum level of copper was observed in the shells of three-spotted crab (Table 3). The higher concentration of copper at Thoothukudi coast is attributed by industrial effluent, industrial water coolant discharge, domestic sewage and harbour activities. Another possibility for higher concentration of copper is due to the copper industry which is situated in the SIPCOT (State Industries Promotion Corporation of Tamilnadu) area.

Lead is known as a snow balling metabolic poison. Its concentration in the coastal region has been altered by human activities. In the present study, the maximum level of lead concentrations was observed in the tissues of *Portunus sanguinolentus* (Table 3).

The high concentration of lead in Thoothukudi coast is related to the input of the industrial effluent from SPUC (Southern Petrochemical Industries Corporation) petrochemical and HWP (Heavy water plant) industry which located in Muthaiyapuram near Thoothukudi. Leaching from antifouling paints from fisherman boats is also one of the reasons for higher concentration of lead at Thoothukudi coast.

Cadmium is a pollutant introduced in the environment as a result of the rapid development of industries and modern technologies. Cadmium is highly toxic to fresh water and marine organisms. It is bioaccumulative through the food chain. It has been demonstrated as highly toxic metal to wild life and carcinogenic to humans^[13].

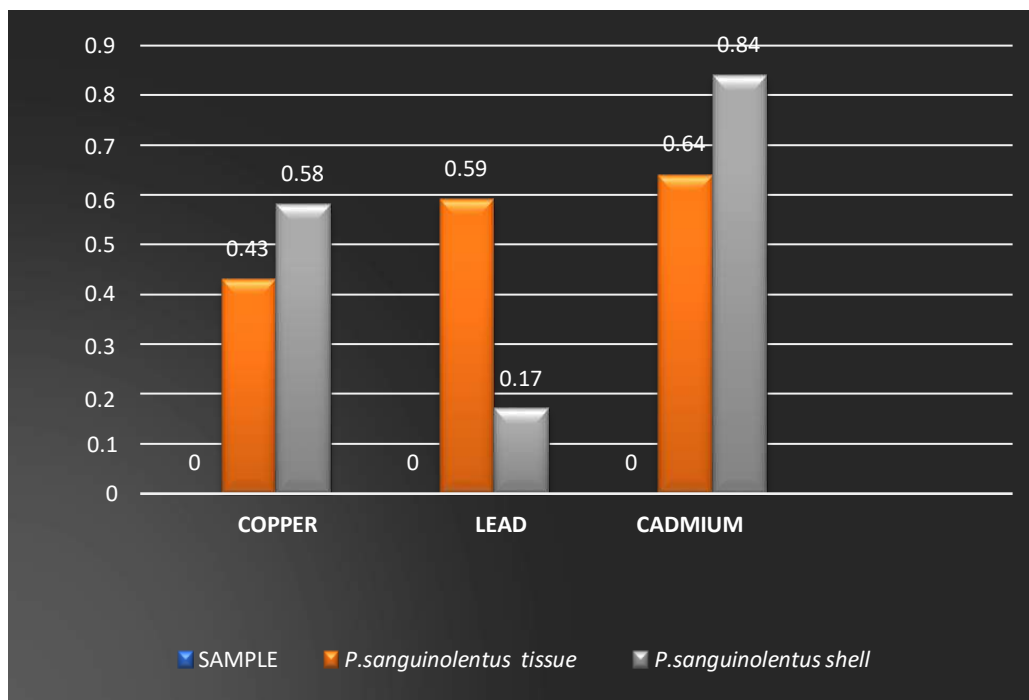
Cadmium may enter into the marine environment through soil and run off from phosphate fertilized agricultural soils, disposal of cadmium is more in *Portunus sanguinolentus*. In the present study, the cadmium concentration was observed higher in level in the shells of three-spotted crab (Table 3).

TABLE-3

HEAVY METAL CONCENTRATION IN TISSUES AND SHELLS OF CRAB

S.No	SAMPLE	COPPER Cu (%)	LEAD Pb (%)	CADMIUM Cd (%)
1.	<i>P. sanguinolentus</i> <i>tissue</i>	0.43	0.59	0.64
2.	<i>P. sanguinolentus</i> <i>shell</i>	0.58	0.17	0.84

GRAPH-1
DISTRIBUTION OF HEAVY METALS IN TWO SAMPLES



CONCLUSION

Crab is a popular shell fish food items offers itself as an obvious choice for meeting an enormous requirement of animal protein. Sea food products are currently in high demand as they are considerably healthy and nutritional.

This study gives an account of different species of crabs available in 5 coastal areas namely Vellapetti, Threspuram, Manapad, Kootapuli and Vembar.

The commercially important edible crabs were *Portunus pelagicus*, *Portunus sanguinolentus*, *Necora puber*, *Scylla serrata*, *Charybids natator*, *Charybids feratius*, *Charybids callianassa*, *Charybdis helleri* and *Cancer productus*. The five species used for fish meal and fish bait were *Calappa calappa*, *Atergatis intergerrimus*, *Leptodius exaratus*, *Libinia emarginata*, *Ocypode quadrata*.

Heavy metals are widespread environmental contaminants from either natural or anthropogenic sources and constitute a potential risk to number of flora and fauna species, including humans through food chains. Sea food consumption is a main source of heavy metal in the people not occupationally exposed. The contaminated sea food may become public health concern.

The conclusion of present study contributed to our knowledge in the extent of accumulation of heavy metals in the shell and tissue of crab *Portunus sanguinolentus* with

respect to human consumption of these species.

The level of concentration of heavy metals in copper, lead and cadmium in crab tissues as well as crab shell was determined using Atomic Absorption Spectrophotometer. As we concluded that the heavy metal concentration in the crabs are below the threshold level associated with the toxicological effects and the regulatory limits and are safe for human consumption.

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SCREENING AND CHARACTERIZATION OF BACTERIA ASSOCIATED WITH PUFFER FISH *DIODON HOLOCANTHUS*

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ABSTRACT

Puffer fish, *Diodon holocanthus* collected from Thoothukudi water were screened for the bacteria associated with skin, liver, intestine and body tissue. The associated strains were both Gram positive and Gram negative, motile, short and long rods. On various cultural morphological and biochemical characteristics, three groups of bacteria were identified. They are *Klebsiella sp*, *Proteus sp* and *Bacillus sp*. Tetrodotoxin (TTX) is commonly found in puffer fishes and Tetrodotoxin (TTX) are produced by a diversity of bacterial species associated with puffer fish. Our results suggest that the three groups of bacterial species may be responsible for the production of toxins. Further the isolation of toxins could lead to the discovery of biological compounds and new drugs for reducing pain in cancer patients.

Key words: Puffer fish, *Diodon holocanthus*, *Klebsella*, Tetrodotoxin, Gram – positive.

INTRODUCTION

Marine organisms are a rich source of structurally novel and biologically active metabolites. Primary and secondary metabolites produced and stored by these organisms may be potential bioactive compounds of interest in the pharmaceutical industries. The number of natural products isolated from marine organisms increase rapidly (Faulkner, 2002 and Proksch *et al.*, 2006). The bio resources present in the marine ecosystem have potent biomolecule which includes many natural organic compounds (Rajamanikandan *et al.*, 2011). The porcupine family Diodontidae contains seventeen species in seven genera (Fricke *et al.*, 2018). The family is widely distributed in tropical and temperate marine areas of the Indo-Pacific and Atlantic Oceans (Leis, 2006). Puffer will eat all type of food such as shrimp fish, clams, molluscs and crustaceans, etc. It is also important that they consume hard shelled crabs, mussels and shellfish in

their diet to wear down their teeth and prevent them from overgrowing. Furthermore toxicity changes with age, sex, season, and geographical variation (Homaira ,2010). The puffer fishes are commonly known for all type of fish poisoning and has been recognized from ancient times. The bacteria associated with some puffer fish produce powerful neurotoxin in their internal organs making them an unpleasant, possibly and lethal meal for any predator (Chun-Fai, 2004).

Several TTX – producing bacterial genera have been isolated from the tissues of various puffer fish species such as intestine, skin and tetrodotoxin accumulating organs (ovary, liver) (Yotsu *et al.*, 1987; Noguchi *et al.*, 1987; Matsui *et al.*, 1989; Lee *et al.*, 2000; Yu *et al.*, 2004; Wu *et al.*, 2005; Bragadeeswaran *et al.*, 2010; Yu *et al.*, 2011; Tu Hoang Nguyen *et al.*, 2015)

In India, studies on the puffer fish are very limited and it remains unexploited. Therefore, this work has been performed to isolate and characterize the associated bacteria from the skin, liver, intestine and body tissue of puffer fish *Diodon holocanthus* collected from Thoothukudi coast.

MATERIALS AND METHODS

Collection of specimen

Specimens of puffer fish *Diodon holocanthus* were collected from fish landing centre at Fishing harbor, Thoothukudi. Then they were washed with seawater and transported to the laboratory and stored in deep freezer at -20°C. Serial dilution

Specimen of puffer fish was thawed and the liver, intestine, skin and body tissue were incised. One gram of each tissue was homogenized with 10 ml of filtered and sterilized sea water and then serially diluted to 10^{-1} , 10^{-2} , and 10^{-3} .

Pour plate culture

6 g of Zobell marine agar 2216 was dissolved in 100 ml of sterilized sea water. The medium was autoclaved at 121°C for 15 minutes. 1 ml of the diluted solution (10^{-1} to 10^{-3}) was poured into the Petridish, the agar medium was poured and rotated clockwise and anti-clockwise direction for thorough mixing. Then the medium was allowed to solidify. All plates were incubated at 37°C for 24 hours.

Isolation of bacterial colonies

Isolated colonies were marked and numbered on the agar plates. The selected colonies were observed under the low power stereo microscope. The cultural characteristics of isolated colonies were observed. The isolated colonies were sub cultured in the agar plates. Each bacterial colony was collected with an inoculation loop and streaked on the marine agar plate to grow a single species of bacteria. The purified strains were stored at -80 °C in the presence of glycerol

Gram stain morphology for identification of bacterial isolates Gram staining

Gram stain is a differential stain that requires primary staining and counter staining. A smeared glass slide was flooded with crystal violet stain and allowed to stand for 5 minutes. The stain was drained and then washed gently with tap water. Then Gram's iodine solution was added and washed after five minutes and the slide was allowed to dry .95% alcohol caused decolorization. Finally the counter stain safranin was added and air dried for two minutes. Then the slides were thoroughly rinsed and observed under oil immersion objective.

Motility test

24 hour bacterial cultures were inoculated into the SIM medium tubes by the method of stab inoculation and incubated at 37⁰C for 24 hours. If the stab remains intact in a single line, it indicates that the bacteria are non – motile. If the stab culture is found disassociated or spread throughout the medium, it indicates that the bacteria are motile.

Biochemical Characterization

A number of biochemical tests were performed for the identification of bacterial isolates with the help of Bergey's Manual . The principal tests used for this purpose are L Indole Test , Methyl Red Test ,Voges-Proskauer Test, Citrate Utilization Test , Nitrate Reduction Test ,Catalase Test, Hydrogen Sulphide Production and Carbohydrate fermentation test.

RESULTS

Cultural characteristics of isolated bacteria

Eight specific isolates with different characteristics were observed and selected from the Zobell Marine Agar 2216 plates. They were further streaked to obtain pure culture. Two bacterial strains from each tissue were selected

and numbered as S₁ and S₂(Skin), T₁ and T₂ (Body tissue), L₁ and L₂(Liver) and I₁ and I₂ (intestine).

Colony appearance of all the isolates was examined. Characteristics including shape, colour, margin, elevation and opacity were studied (Table 1). It was observed that the forms of the colonies of bacterial isolates were circular, rhizoid, filamentous and irregular. Most of the colonies, which were selected visually based on differences with naked eye, were of whitish and cream colour. Margin of bacterial colonies isolated were found to be entire and filiform. Opacity of the colonies was observed mostly to be opaque or transparent.

Morphological characteristics of isolated bacteria

The isolated strains were both Gram positive and Gram negative. Most of the strains were long rods. All strains were motile (Table 1). A variety of biochemical assays were carried out to identify the bacterial isolates (Table 2). The isolates differed from each other in substrates utilization in biochemical tests. All bacterial isolates produced catalase and reduced nitrate. The strains were positive for the methyl red, negative for Voges Proskauer tests and positive for the indole tests. The carbohydrate fermentation pattern exhibited by all the isolates. The main variable reactions among the isolates were gelatin liquification, H₂S acid production, citrate test and starch hydrolysis.

Table-1 Cultural and Morphological Characteristics of isolated bacteria

Strains	Cultural characters					Morphological characters		
	Shape	Elevation	Margin	Colour	Opacity	Shape	Motility	Gram staining
S1	Flat	Raised	Entire	White	Opaque	Long rods	+	-ve
S2	Circular	Raised	Entire	White	Transparent	Small rods	+	-ve
T1	Irregular	Raised	Entire	White	Opaque	Long rods	+	-ve
T2	Rhizoid	Raised	Rhizoid	Dull white	Opaque	Small rods	+	+ve
L1	Irregular	Raised	Entire	White	Opaque	Long rods	+	+ve
L2	Irregular	Raised	Entire	White	Opaque	Long rods	+	-ve
I1	Filamentous	Flat	Filiform	White	Transparent	Long rods	+	-ve
I2	Filamentous	Flat	Filiform	White	Opaque	Long rods	+	+ve

Table-2 Biochemical characteristics of isolated bacteria

S.No.	Name of the test	S1	S2	T1	T2	L1	L2	I1	I2
1.	Catalase Test	+	+	+	+	+	+	+	+
2.	Nitrate Test	+	+	+	+	+	+	+	+
3.	Gelatin Liquification	+	+	+	+	–	+	+	+
4.	H ₂ S Production	+	+	+	+	+	–	+	+
5.	Citrate Test	+	+	+	–	–	–	+	+
6.	Indole Production	+	+	+	+	+	+	+	+
7.	Starch hydrolysis	+	–	–	+	+	+	+	–
8.	Methyl red Test	+	+	+	+	+	+	+	+
9.	Voges- Proskauer Test	–	–	–	–	–	–	–	–
10.	Carbohydrate fermentation test	+	+	+	+	+	+	+	+

Identification of bacterial isolates

Eight bacterial strains were isolated from skin, liver, intestine and body tissue of puffer fish *Diodon holocanthus* and identified. They were identified upto genera level by comparing the results with Bergy's Manual of Determinative Bacterology (1975). They belong to three genera namely *Klebsilla sp*, *Proteus sp* and *Bacillus sp*.

Discussion

The analyses presented here aimed to isolate and identify the bacteria associated with various tissues like skin, intestine, liver and body tissue of puffer fish *D. holocanthus*. The colour of bacterial colonies isolated in the present investigation was white and dull white. Zobell and Feltham (1934) noted that 31.3% of the colonies were yellow, 15.2% were orange, 9.9 % were brown, 7.4% were fluorescent and 5.4% were red or pink. Many marine bacteria tend to lose their ability to produce pigment during prolonged laboratory conditions.

The carbohydrate decomposition spectrum determined by the production of acid from substrates is regarded as one of the tools in characterization. Much emphasis is put on the pathways and end-products of glucose metabolism. Oxidation fermentation (OF) medium of Hugh and Leifson (1953) is essential

for the determination of type of glucose metabolism. Rapid fermenters produced acid that spread throughout the medium. Weak fermenters showed delayed acid production, at first at the surface, then along the side of the stab and oxidizers produced acid only at the surface (Lanyi, 1987). In the present observation, *Klebseilla sp*, *Proteus sp* and *Bacillus sp*, showed fermentative breakdown of glucose. Yellow colour was produced throughout the medium. Fermentation is characteristics of most obligate anaerobic and facultative anaerobic bacteria (Lanyi, 1987).

The formation of H₂S by bacteria during the decomposition of sulphur containing compounds, was associated with the enzymatic decomposition of proteins or peptones composed of amino acids containing sulphur. Hydrogen sulphide was produced by certain bacteria like *Pseudomonas sp*, *Aeromonas sp*, and *Flavobacterium sp* through dissimilation of sulphur containing amino acid eg. cystine, methionine or through reduction of inorganic sulphur compounds such as thiosulphate, sulphate or sulphide.

Under anaerobic conditions, cystine was first reduced to two molecules of cysteine, followed by the breakdown of the cysteine to H₂S, NH₃, acetic acid and formic acid. Under anaerobic conditions, cysteine was said to be dissimilated into H₂S and other products (Salle, 1988). H₂S reacted with heavy metals to produce coloured metal sulphides. Metal salts which yielded dark coloured sulphides were incorporated in solid media, lead was the first metal incorporated in culture media, when cultured in media containing lead acetate, the bacteria turned them black. As here observed *Klebseilla sp*, *Proteus sp*,(L1) and *Bacillus sp* showed hydrogen sulphide production while *Proteus sp*,(L2) showed negative result.

Lanyi (1987) reported that starch hydrolysis test may be applicable for all kinds of microorganisms, based on a colour reaction of non-hydrolysed starch with lugol's iodine. Starch produced a deep blue colour, whereas its break down products, as hydrolysis progresses gradually became violet, brownish red and finally colourless. Our results showed that , *Bacillus sp*, (T2and L1) and *Proteus sp*. (L2 and I1) were able to hydrolyse starch. During the hydrolysis of starch, deep blue colour gradually changed to violet, brown and

finally colourless.

In gelatin hydrolysis, the extracellular proteolytic enzymes of bacteria hydrolysed into polypeptides and amino acids. Production of the enzyme can be demonstrated in classical nutrient broth solidified with gelatin. As the cultures usually incubated at a temperature above the melting point of gelatin, 2-3 hr prior to reading they should be cooled, the test is positive if the inoculated medium is liquid but the control medium is solid (Lanyi, 1987). All the bacterial isolates associated with different tissues of the pufferfish *Diodon holocanthus* except *Bacillus* sp (L1) are able to secrete gelatinase in the medium.

Testing of nitrate decomposition is of great value in identification. *Acinetobacter*, *Flavobacterium*, *Alcaligenes odorans* and some other aerobes and many anaerobic bacteria do not attack nitrate. Most bacteria including *Enterobacteriaceae* produced nitrite whereas *Pseudomonas aeruginosa* and some other *Pseudomonas* and *Alcaligenes denitrificans* produced nitrogen gas (Lanyi, 1987). The enzyme nitrate reductase reduced nitrate to nitrite. In the present results “nitrate reduction” was recorded in all strains associated with muscle, liver, skin and intestine of puffer fish *D. holocanthus*.

Catalase activity results in the production of molecular oxygen, whereas peroxides decompose H_2O_2 only in the presence of an organic oxygen acceptor. Cowan (1974) reported that catalase production is of great taxonomic importance in contrast, detection of peroxidase is not significant in identification. Micrococcaceae produce catalase abundantly, and many other bacteria exhibit a weaker activity. For example *Streptococcus*, *Erysipelothrix*, *Caidiobacterium*, *Kingella* and *Eikenella* are characteristically catalase – negative organisms. Strict anaerobes lack catalase, however most anaerobically growing *Propionibacterium* isolates produce the enzyme. In the present investigation, all the bacterial strains associated with body tissue, skin, liver and intestine of puffer fish *D. holocanthus* produced catalase enzyme

In 1987, Lanyi reported that methyl red is performed mainly for the intrageneric differentiation of *Enterobacteriaceae*. In glucose phosphate

peptone water medium, methyl red positive bacteria produce acid in amounts sufficient to maintain the pH below 4.5 for several days. Methyl red negative bacteria continue to metabolize the acids that were produced into neutral substances. Our results showed that all strains associated with body tissue, liver, skin and intestine of pufferfish *D.holocanthus* produced red colour indicating the production of acid .

The Voges-Proskauer (VP) test is based on the detection of acetoin (acetyl methyl carbinol) produced in the course of glucose break down by most isolates of *Klebsiella*, *Enterobacter* and *Serratia* (Lanyi, 1987). If the potassium hydroxide is added in the presence of air to the culture of VP positive organisms, acetoin would be oxidized to diacetyl which could form a pink condensation product with guanidine nuclei present in arginine and other peptone constituents (Mac-Faddin, 1980). The colour intensified if creatine, which contains a guanidine nucleus was added. In the present observation, all strains associated with body tissue, liver, intestine and skin showed negative result.

The bacteria *Shewanella* sp. was isolated from the liver of *Lagocephalus wheeleri* while *Exiguobacterium* sp. and *Staphylococcus* sp. were isolated from the liver of *L. sceleratus*. Simon *et al.*, (2009) and Yu *et al.*, (2011) isolated the TTX-producing bacterial species, *Raoultella terrigena* from the intestine of a local toxic puffer fish *Takifugu niphoble*. Lee *et al.*, (2000) isolated a *Vibrio* strain from the intestine of the puffer fish *Fugu vermicularis radiates*. In the present investigation, *Klebsiella* sp., *Proteus* sp. and *Bacillus* sp., were isolated from the various tissues like body tissue, skin, liver and intestine of puffer fish *D. holocanthus*.

CONCLUSION

The present study revealed the presence of bacterial species such as *Klebsiella* sp., *Proteus* sp. and *Bacillus* sp in the body tissue, liver, skin and intestine of puffer fish *D.holocanthus* according to their cultural, morphological and biochemical characteristics. Puffer fish is the most recognizable organism that contains TTX. The puffer fish is a well-known source of TTX. Several species of bacteria were discovered to produce TTX.

The occurrence of TTX in puffer fish suggested that the toxin could either be acquired through the food web or it is the product of bacterial symbionts. The bacterial strains associated with *Diodon holocanthus* may be a source of TTX. TTX is a powerful sodium channel blocker. It is a very promising substance for the treatment of various types of pain. This finding could shed light on the bacterial strains associated with puffer fish which are responsible for the production of TTX.

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ANALYSIS OF ORGANOLEPTIC, PHYSICO-CHEMICAL AND MICROBIAL PROFILE OF RAW COW MILK SAMPLES FROM INDIGENOUS AND EXOTIC BREEDS

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Abstract

Milk is a highly nutritious complete food and can support a rich microbiota. This study was undertaken to analyse the organoleptic, physico-chemical and microbial qualities of raw milk samples from indigenous Kangayam breed and exotic Holstein Friesian breed. The organoleptic score was high for Kangayam breed. pH was higher for Kangayam breed and the pH was 6.6. Clot on boiling test was negative for both the milk samples. Methylene blue reduction test revealed very good quality for Kangayam breed. Amount of carbohydrates, proteins and fats was higher in Holstein Friesian breed. Total viable count of raw milk of Kangayam breed was $\log_{10} 3.0017$ cfu/ml. Acid producers, proteolytic colonies and chromogenic colonies were recorded. Total viable count of Holstein Friesian sample was $\log_{10} 2.8401$ cfu/ml and chromogenic colonies were not detected. Psychrotrophic count, yeast and mould counts were not observed. Coliform counts, a cornerstone of microbial testing which bear to profound implications on public health were registered for both the milk samples. But the counts were within the permissible limits.

Key words: Milk, microbial count, coliforms, public health

Introduction

India has one of the oldest civilizations in the world since 8000 years ago with vast biological resources and the traditional dietary culture ^[1]. Drinking of animal milk and its fermented products is the ancient tradition of Indian gastronomy since 6000 BCE. The “ethnomicrobiology” of Indian people has supplemented in understanding diverse microbial community in naturally fermented milk products, and some of them have probiotic attributes and functionalities ^[2]. Milk is an important part of the Indian diet and is a source of important nutrients. Being a rich source of nutrients, milk is susceptible to contamination by many microorganisms including pathogenic microbes, which can cause the food-borne illness and are a threat to consumer's health. Moreover, the milk acts a good growth medium for the further multiplication of these pathogens ^[3,4,5].

The cow milk is classified into two types – A₁ and A₂. A₁ and A₂ are the two forms of beta – casein, a sub – group of casein that is the largest protein group found in

milk. A₁ milk is obtained from cows of western or foreign origin like HolsteinFriesian, Jersey etc., and yield large quantities of milk. A₂ milk, on the other hand, is obtained from desi cows of Indian origin like Gir, Sahiwal etc. which may give relatively lesser milk. It is beneficial for improving the health of a person as well as enhancing nutritional value. In this study an attempt has been made to distinguish between raw milk samples from indigenous Kangayam breed and exotic Holstein Friesian breed from the public health standpoint.

MATERIALS AND METHODS

Collection of milk samples

The raw cow milk samples were collected from the study area, Munnerpallam, Tirunelveli. The samples were brought to the laboratory at 4°C and subjected to analysis.

Analysis of milk samples

For organoleptic analysis ^[6], pH analysis ^[7] and physico-chemical analysis ^[8] standard methods were employed. A panel of four members evaluated the colour and appearance (10), flavour (10), odour (10), body and texture (10) and overall acceptability. The scores were given to the sample for 100 and the average was calculated.

Microbial analysis

Total viable count (TVC), Coliform count (CC), Psychrotropic Count (PC), Spore Count (SC), Yeast and Mould Count (YMC) and Chromogenic colonies were made^[9]. Pour plate technique was made. The counts were expressed in log cfu/ml.

Detection of coliforms

Identified by following standard method ^[10]. Cultural, morphological and biochemical tests were identified. Gram staining was done. IMVIC test was used to identify Enterobacteriaceae.

Statistical methods

Standard deviation and standard error of mean were computed ^[11]. Using Students't test 95% confidence limits were specified. One way ANOVA was performed to assess the variation between the breeds.

RESULT AND DISCUSSION

Milk has complex nature and baffling properties. The quality of milk encompasses milk characteristics such as chemical composition, physical properties, microbiological and cytological quality, sensory properties, technological stability and nutritive value ^[12].

The organoleptic scores are depicted in Figure-1 and Figure-2 for the Kangayam breed and Holstein Friesian breeds respectively. The sensory score was found to be higher for raw milk of Kangayam breed than Holstein Friesian breed. The raw cow milk of

Kangayam breed had high organoleptic acceptability, white milky colour from the aspect of visualization, fine natural smell and no sediment contamination. The results were in consonance with Lingathurai and Vellathurai^[13].

Figure 1: Organoleptic quality analysis of raw milk of Kangayam

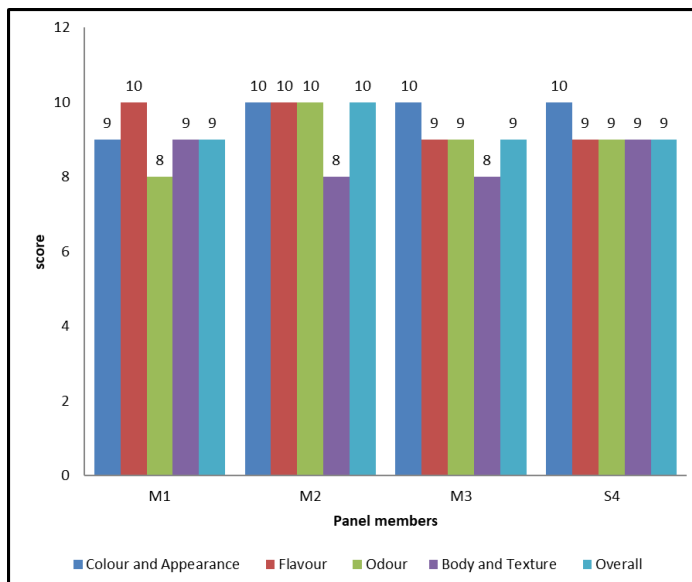
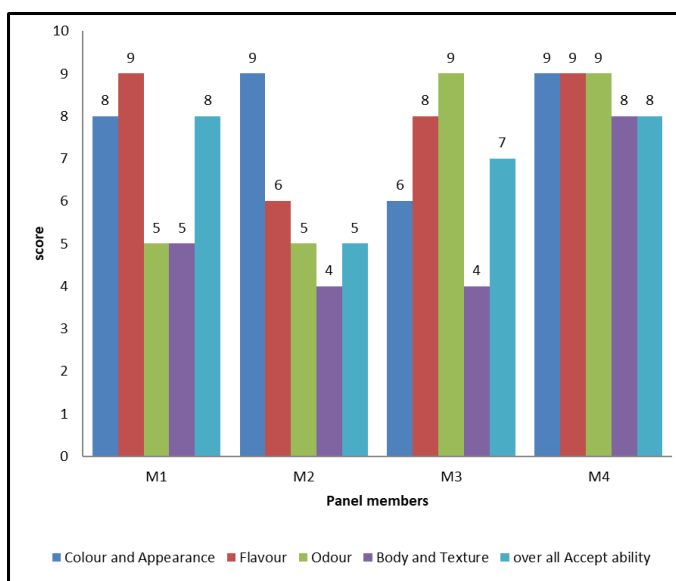


Figure 2: Organoleptic quality analysis of raw milk of Holstein Friesian



The results of physico-chemical analysis of milk samples are illustrated in Table-1. pH was found to 6.4 for Holstein Friesian breed . Clot on boiling test was negative for both samples. The carbohydrates, proteins and lipids were high in Holstein Friesian breed sample.

Table I

Physico-chemical analysis of raw milk samples

Parameters	Kangayam	Holstein Friesian
pH	6.6	6.4
COB test	Negative	Negative
MBR test	Very Good	Good
Moisture %	95.37±0.01	83.78±0.06
Protein %	2.13±0.13	3.65±0.03
Fat %	2.54±0.05	4.14±0.39
Carbohydrates %	4.44±0.04	6.59±0.28
Titrateable acidity %	0.71±0.13	1.35±0.13
Total solids	6.34±0.01	12.26±0.06

The microbial analysis of milk is quite significant as it can pose serious health hazard. The results of microbial profile are shown in Table-2.

Table -2 Microbial profile of raw milk samples

Microbial counts log ₁₀ cfu/ml	Kangayam					Holstein Friesian				
	Mean	Standard deviation	Standard error	Confidence limit		Mean	Standard Deviation	Standard error	Confidence limit	
				Upper	Lower				Upper	Lower
Total viable count (TVC)	3.00 17	0.27	0.1558	3.40 22	2.60 12	2.84 01	0.24	0.1384	3.19 61	2.48 41
Acid Producers	1.31 73	0.18	0.1039	3.58 44	3.05 02	1.21 20	0.19	0.1096	1.51 35	0.91 05
Proteolytic Colonies	0.78 18	0.14	0.0808	0.98 95	0.57 41	1.23 21	0.17	0.0981	1.48 43	0.97 99

Chromogenic Colonies	0.97 61	0.13	0.0750	1.16 89	0.78 33	–	–	–	–	–
Psychrotrophic Colonies	–	–	–	–	–	–	–	–	–	–
Coliform Count	1.09 38	0.11	0.0635	1.25 71	0.93 02	1.31 42	0.09	0.0519	1.44 76	1.18 08
Yeast and Mould Count (YMC)	–	–	–	–	–	–	–	–	–	–
Spore Count	–	–	–	–	–	–	–	–	–	–

Total viable count of Kangayam breed was \log_{10} 3.0017 cfu/ml and for Holstein Friesian breed \log_{10} 2.8401cfu/ml. Acid producers, proteolytic colonies and chromogenic colonies were observed for Kangayam breed sample. Chromogenic colonies were not found in Holstein Friesian breed.

The proteolytic colonies produce proteolytic enzymes such as protease and lipase resulting in coagulation, bitter flavour, putrid and yeasty flavour in milk^[14]. Proteolytic colonies could be one of the helpful indicators to express the quality and conditions of milk samples since milk is categorized as protein rich food. It also gives valuable insights about the shelf life and spoilage level of the raw cow milk samples.

Psychrotropic count, yeast and mould count and spore counts were not recorded for both samples. Many proteolytic bacteria are psychrophilic and one of the common examples is *Pseudomonas* sp. which account for more than 50% of the psychrotrophs ^[15]. Coliforms were detected in both samples.

Results of ANOVA are given in Table-3. F value was found to be statistically significant at 5% level of significance. It indicated more variance between the breeds.

Table- 3
ANOVA for bacterial counts of raw milk samples of
Kangayam and Holstein Friesian

Source of Variation	SS	DF	MS	Fs	Fcrit
Between group	16.9141	1	16.9141	8.5227	2.37
Within group	11.9076	6	1.9846		
Total	28.8217	7			

P< 0.05 statistically significant

In the microbiological testing an indicator organism is defined as a marker that reflects general microbiological condition of a food or environment. In dairy industry coliforms serve as hygiene indicator. At best, coliform testing provides insight into public health risks.

Coliforms are aerobic or facultatively anaerobic, gram negative, non- spore forming rods capable of fermenting lactose to produce gas and acid within 48 h at 32-35⁰C. Most bacterial genera that comprise the coliform group – *Escherichia*, *Klebsiella* and *Serratia* are within the family Enterobacteriaceae. In the present analysis, coliforms particularly *E.coli* was recorded. Coliform counts were within regulatory limits as per microbiological criteria.

CONCLUSION

Milk quality has an impact on human health, milk processing and on-farm profitability. Microbes in milk play an important public health role and manufacturing role in the case of dairy products. Milk reaching the consumer should be safe, wholesome produced and processed in sound sanitary manner and truthfully labelled. In India demand for safety shadow the hunger. Revolution of any techniques may offer tantalizing new prospects in white revolution for the benefit of people.

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ANTIBACTERIAL AND WOUND HEALING ACTIVITY OF *MOMORDICA* *CYMBALARIA* UNRIPE FRUIT EXTRACT

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ABSTRACT:

Medicinal plants possess stronger antimicrobial qualities compared to other antifungal and antibacterial compounds with narrow range of specificity. Compared to allopathic and other chemical and synthetic antimicrobials, the plant extracts are holistic in their approach. The Ethanolic extract showed higher range and broad spectrum of antibacterial activity compared to the aqueous extract. Maximum zone of inhibition was observed in *E.coli* with 15mm with ethanol extract of *M.cymbalaria* and minimum inhibition was 8mm with aqueous extract against *Klebseilla pneumoniae* respectively *Momordica cymbalaraia* in the four groups healing was observed on the 16 th day and the test group consisting of the aqueous and ethanolic extract were found to exemplenary and exhibited 85.73 % and 89.39% in comparison to standard with 90.06% healing in excision wound.

KEYWORDS: Aqueous extract, Ethanolic extract, Antibacterial, Wound healing, Excision, Well diffusion.

INTRODUCTION:

The inventoried plant species in the current work are frequently used for the treatment of various illnesses and to ensure the medication safety of people^[1]. This manifold assertion in plant drug medical compounds which is growing at 7-15% rate despite the advances in modern medicine ^[2]. India is the largest producer of medicinal herbs and is known as the world's botanical garden ^[3]

Antimicrobial therapy is the mainstay line of treatment to treat this infection. It is important to quantify and qualify the active component from these plant extracts^[4]. Secondary metabolite success depends on the presence of high diversity and wide spectrum of biological activities present in them ^[5]. Bacterial resistance to antibiotics is a therapeutic problem and the rate at which new antibiotics are being produced is slow ^[6]. Athulakkai (*Momordica cymbalaria*) has a long history as a medicinal plant with antimicrobial resistance and also analyze the inhibitory activity of the whole fruit^[7]. It has been also used for skin disease. The tuber of the plant is used in treatment of diabetes and is also

reported to have antioxidant enzymes^[8]. And it has ascorbic acid content and presence of carotene in negligible^[9]. *Momordica cymbalaria* can be successfully used for the synthesis of AgNPs that exhibit effective anti-bacterial as well as cytotoxic potential. They have bactericidal effect against *Staphylococcus aureus*, and *E. coli*^[10]. *M. cymbalaria* seed shows more significant antiallergic activity. Wound healing is an interaction of complex cascade of cellular and bio chemical actions healing to the restoration of structural and functional integrity with regain of strength of injured tissues^[11]. So there prevails a need for new novel drugs with low side effect and exhibiting cytotoxic potential on a large scale gradually to the host when applied and improving the immunity.

MATERIALS AND METHODOLOGY:

Extract preparation: The unripe *Momordica cymbalaria* fruits were collected from the local market and washed thoroughly then shade dried and then finely powdered using electric blender. Then it was subjected to soxhlet extraction with distilled water and ethanol as solvents for 8 hours. Then it was evaporated and the extract was stored at 4°C for further analysis.

Physical & biochemical characterization of isolates for anti bacterial activity:

A total of 3 isolates from diabetic wound including both gram positive and gram negative organisms were selected to assess the susceptibility patterns against aqueous and Ethanolic extract of *Momordica cymbalaria*. Isolates were characterized using colony morphology, gram staining and biochemical tests - indole, methyl red, catalase, voges-proskauer, urease, oxidase. The isolates were cultured in specific selective media for confirmation of the genus. The antibacterial activity was done by adopting well diffusion method.

WOUND HEALING ACTIVITY:

Ointment Formulation: A control ointment base was formulated without any drug content. Creams was formulated by using 10% extract The standard drug for screening wound healing activity is Povidone iodine ointment (5%w/w) which was bought commercially.

Animal Model: Albino rats (150-250gm) of either sex procured and they were divided into four groups of six rats.

Grouping: The animals were divided into the following four groups of six animals each (both male and female) and were treated as given below:-

Group I - Normal control group received petroleum jelly

Group II - Standard group received Povidone iodine ointment

Group III - Drug treated group received 10% w/w of aqueous extract

Group IV - Drug treated group received 10% w/w of ethanolic extract

Percentage formula: The percentage of wound contraction was determined using the following formula:

$$\% \text{ of wound contraction} = \frac{\text{Initial day wound size} - \text{Specific day wound size}}{\text{Initial day wound size}} \times 100$$

RESULTS AND DISCUSSION:

The isolates were screened morphologically and biochemically using different biochemical test and they were identified as *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella pneumoniae*. *Momordica cymbalaria* showed varied differentiation in the antibacterial activity with range of inhibition from 8-15mm against the tested organisms. The ethanolic extract of *Momordica cymbalaria* showed maximum activity against gram negative *E.coli* (15mm) and *Klebsiella pneumonia* (13mm). But it showed minimum activity with gram positive *Staphylococcus aureus* (10mm). The aqueous extract of *Momordica cymbalaria* showed highest activity with *Staphylococcus aureus* (13mm) and minimum activity with the gram negative *Esherichia coli* and *Klebsiella pneumoniae* (9mm) and (8mm) respectively as shown in the table 1 and figure 1. In excision wound analysis the contraction of wound progress identically with providing iodine ointment and in wound treated with ethanolic extract of *Momordica cymbalaraia*. On the 16 th day, the test group consisting of the aqueous and ethanolic extract were found to exemplenary with 85.73 % and 89.39% in comparison to standard with 90.06% healing in excision wound which is according to the table 2 and figure 5. The difference in the antimicrobial effect may be due to permeability barrier^[12]. The gram negative bacteria comprises of outer membrane that act as a barrier to many environmental substances including antibiotics^[13].

CONCLUSION:

Maximum zone of inhibition was observed in *E.coli* with 15mm with ethanol extract of *M.cymbalaria* and minimum inhibition was 8mm with aqueous extract against *Klebseilla pneumoniae* respectively. However further studies are required to evaluate the potential effectiveness of the antibacterial agents from plant species. The *Momordica cymbalaria* Ethanolic extract showed high percentage of healing on excision wound model. Aqueous extracts showed relatively low activity when compared to standard. Based on the analysis,

Ethanol extract shows higher activity in the test and can be used as a effective antibacterial and wound healing agent.

Table -1: Antibacterial activity of *Momordica cymbalaria* extracts.

S.NO	SAMPLE	TEST ORGANISMS AND ZONE OF INHIBITION IN (mm)		
		<i>Escherichia coli</i>	<i>Staphylococcus aureus</i>	<i>Klebsiella pneumonia</i>
1	Amoxycillin +ve control	22mm	25mm	20mm
2	DMSO -ve control	-	-	-
3	<i>Momordica cymbalaria</i> aqueous extract	9 mm	13mm	8mm
4	<i>Momordica cymbalaria</i> ethanolic extract	15mm	10mm	13mm

Table -2:Effect of Topical Application of Aqueous and Ethanolic on Excision Wound Model (wound area mm²)

Treatment	% wound contraction in excision wound model		
	0 day	8 th day	16 th day
Group I Control (simple ointment)	521.02±3.15	316.55±3.30 (39.24)	119.55±3.23 (77.05)
Group II Standard	523.47±2.42	218.09±2.00 (58.33)	49.17±0.75 (90.06)
Group III Sample I 10% (Aqueous extract)	603.62±2.57	425.32±4.13 (29.53)	101.82±1.43 (85.73)
Group IV Sample II 10% (Ethanol extract)	613.6±2.07	313.57±2.44 (48.89)	65.10±0.84 (89.39)

Values are the mean ±SEM, values showing percentage closure of original excision wound area.

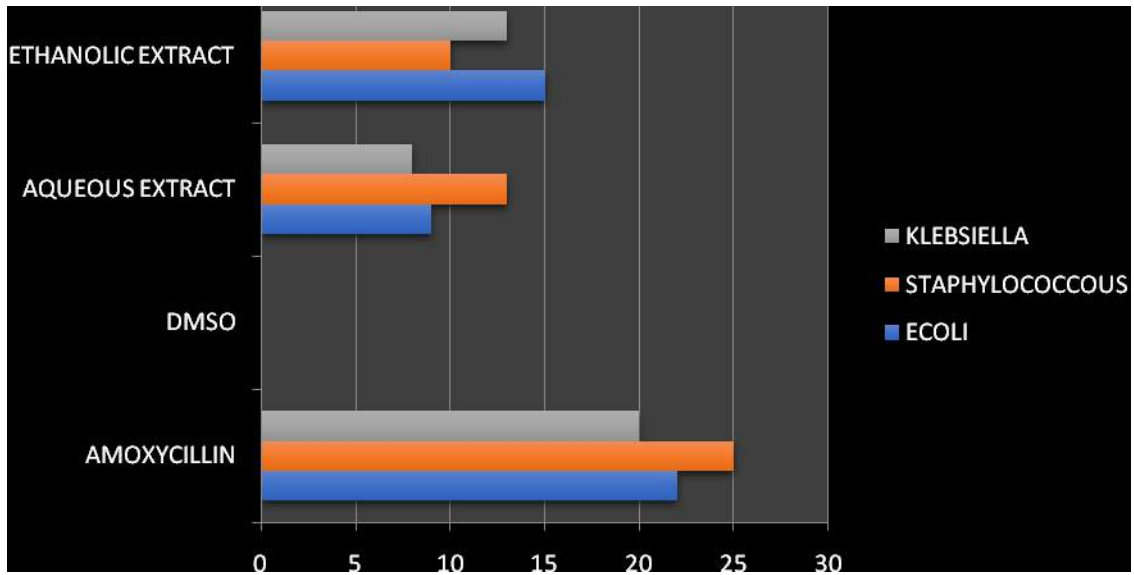


Figure-1: Anti bacterial effect of *Momordica cymbalaria*



Figure-2: Zone of inhibition against *Klebsiella pneumoniae*



Figure-3: Zone of inhibition against E.Coli

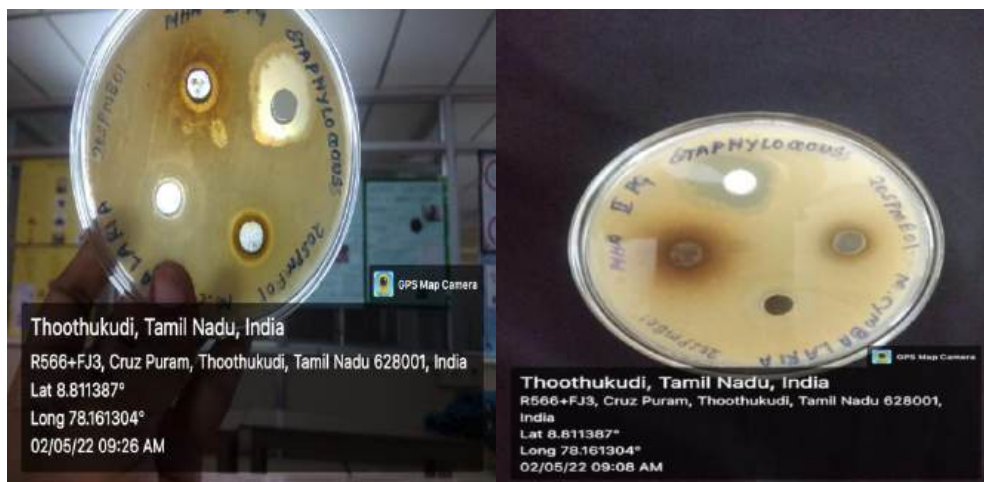


Figure-4: Zone of inhibition against *Staphylococcus aureus*

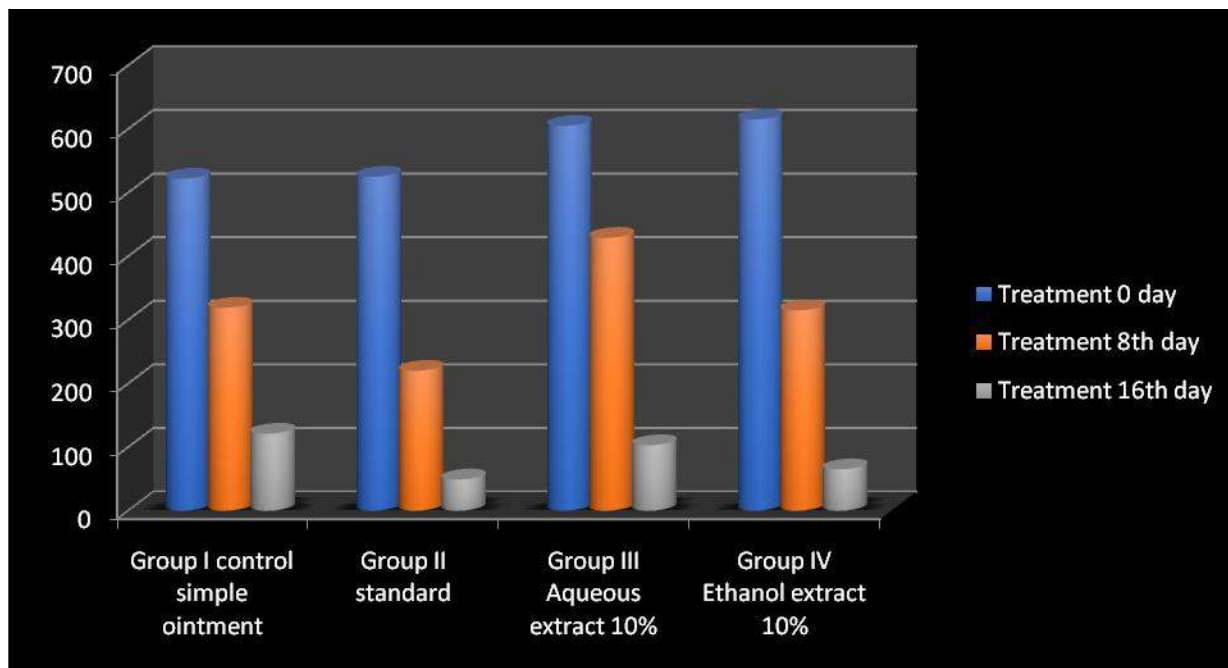


Figure-5: Effect of wound healing activity of aqueous and ethanolic extract of *Momordica cymbalaria* on excision wound

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EFFECT OF OCIMUM TENUIFLORUM EXTRACT IN MODULATING APOPTOTIC GENES IN KB ORAL CANCER CELL LINE

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Abstract

With cancer being a widespread threat to humanity, plants have an important role in cancer prevention and in therapy. Medicinal plants provide new active chemo-preventive molecules. It is suspected that *Ocimum tenuiflorum* would be a potent weapon discovered so far in fighting against all kinds of Cancer. There are many HDAC inhibitors, but they are toxic in nature. In this study, we aim at finding a phytochemical which is less toxic to humans. Surge of cancer incidence, effects of chemotherapeutic agents and their cost and reduced survival and responsiveness to treatment have led to shift of attention of researchers toward herbal remedies to look for newer dimensions in cancer therapy. *Ocimum tenuiflorum*, Holy Basil or Tulsi is the holiest herb which is used in the Indian household, has drawn much attention toward its various health benefits, especially anti-cancer properties. The present study was carried out to evaluate the cytotoxic effect of *Ocimum tenuiflorum* extract in modulating apoptotic genes in oral cancer KB cell lines.

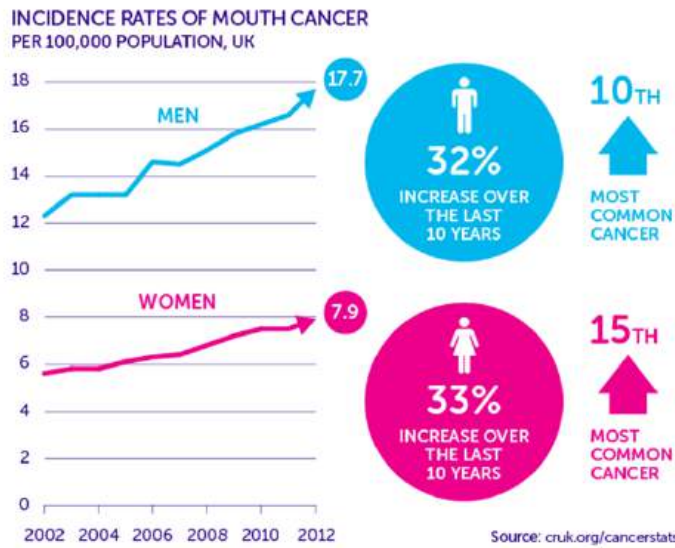
KEYWORDS:

Ocimum tenuiflorum, KB cell lines, Tulsi, Phytochemical analysis, chemotherapeutic agents.

INTRODUCTION:

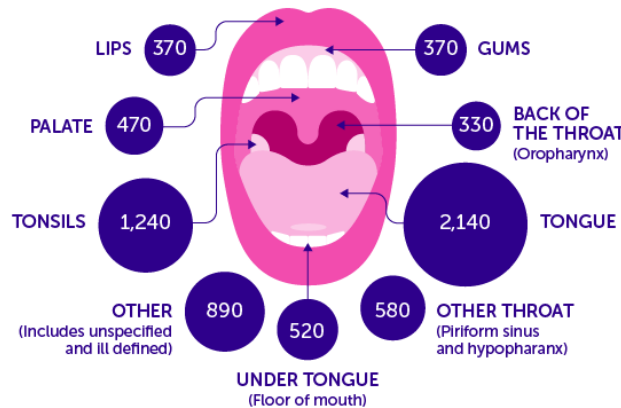
Oral cancer seems to be a leading cause of death worldwide and its prevalence is very high in developing countries where people chew tobacco and betel nuts on a regular basis, alcohol use (or both) or infection by the Human Papilloma Virus (HPV). Tobacco and alcohol consumption are the most significant risk factors for oral cancer. Oral cancer is likely to occur in people over the age of 40 and affects more than twice as many men when compared to women.

MOUTH CANCER RATES ON THE RISE



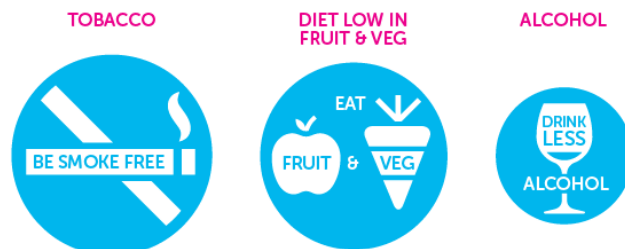
MOUTH CANCER AND THE THREE MAIN PREVENTABLE RISK FACTORS

MOUTH CANCERS AND THE AVERAGE NUMBER OF CASES PER YEAR UK, 2010-2012



THE THREE MAIN PREVENTABLE RISK FACTORS

Proportion of mouth cancer cases that could be prevented each year in the UK, by avoiding each risk factor



According to Globocan 2020, 377,713 new cases are reported every year worldwide and oral cancer has become a common malignancy with 177,757 deaths each year. Oral cavity cancer is very common in South-Central Asia (e.g., India, Pakistan, and Sri Lanka)

with more than one-third of the new cases (135,929) and one-fifth of the deaths (75,290) occurring in India alone.

The most commonly used treatment plan includes Radiation, chemo, targeted, immuno, and hormone-based therapies along with surgery. However, these treatments frequently result in various unwanted short- to long-term side effects. Hence, recent research is looking around for the urgency to evolve suitable chemotherapy consistent with new discoveries in cell biology for the treatment of cancer with less or no toxic effect . Considering the above, there is an urgent need to develop treatment options for oral cancer that have less or no adverse effects. Though there are different groups of drugs that work in different ways to fight cancer cells and shrink tumors. Nowadays, herbs are used for cancer remedies. Number of bioactive compounds derived from various plants have recently attracted attention as therapeutic options for cancer treatment. Antioxidants that are found in medicinal plants such as Vitamins A, C, and E reduce damage to the mucosa by neutralizing free radicals found in various oral mucosal lesions. Phytochemicals that are found in medicinal plants have the potential to modulate cellular signaling pathways that alter the cellular defense mechanisms to protect normal cells from Reactive Oxygen Species (ROS) and induce apoptosis in cancer cells

MATERIALS AND METHOD:

Collection of Plant Samples

Tulsi plants were collected from the garden and identified morphologically. The collected samples were rinsed with water to remove epiphytes and necrotic parts. The plants were again washed with tap water to remove any associated debris and shade dried at room temperature ($28\pm 2^{\circ}\text{C}$) for 5-8 days or until they are brittle.

Plant extract Preparation

The stems and leaves were collected, washed and frozen. The frozen plant material was ground to a fine powder in liquid nitrogen using a warring blender. Once ground, the plant material was weighed and extracted using absolute methanol (1 g/10 ml, w/v) at room temperature for 24 hours. The resulting extract was filtered through a Whatman filter paper, and the filtrate was dried at 40°C under low pressure using a buchi rotavapor R-205 (buchi Labortechnik AG, Switzerland). Once dried, the extract was weighed and dissolved in 100%

dimethyl sulfoxide (DMSO, Sigma) to the desired concentration and stored as a stock solution in an airtight container at -20°C until use.

RESULTS & DISCUSSION:

Chemical Composition:

Some of the phytochemical constituents of tulsii are oleanolic acid, ursolic acid, rosmarinic acid, eugenol, carvacrol, linalool, and β -caryophyllene (about 8%) (CABI Invasive Species Compendium). The essential oil in tulsii consists mostly of eugenol (~70%) β -elemene (~11.0%), β -caryophyllene (~8%), and germacrene (~2%), with the balance being made up of various trace compounds, mostly terpenes (IT IS Standard report page).

Genome Sequence:

The genome of the tulsii plant has been sequenced and reported as a draft, estimated to be 612 mega bases with results showing genes for biosynthesis of anthocyanins in *Shyama Tulsii*, ursolic acid and eugenol in *Rama Tulsii*[52; 53]. The predicted proteins and other annotations are available [53]

MTT Assay:

MTT assay is a cell cytotoxicity or viability assay. The tulsii herbal extracts was screened for their possible antiproliferative effect against KB cancer cell lines. The MTT assay method is used to described in Methodology Section. Results obtained suggest the crude extracts of the tulsii plant exhibit significant antiproliferative activity against KB oral cancer cell lines showing very good activity at the highest concentration tested of 49.7 μ g/ml, following 24-hour treatment. Cells were treated for 24 hours at increasing concentrations of 10, 20, 30, 40, 50 and 60 μ g/ml using the plant aqueous extracts. Figure 8 shows the morphological representation of the KB Oral Cancer cells showing apoptotic changes in the treated group. Figure 9 shows graphical representation of cell viability assay using MTT Analysis. Table 1 shows the data points of Cell Viability Assay using MTT Analysis.

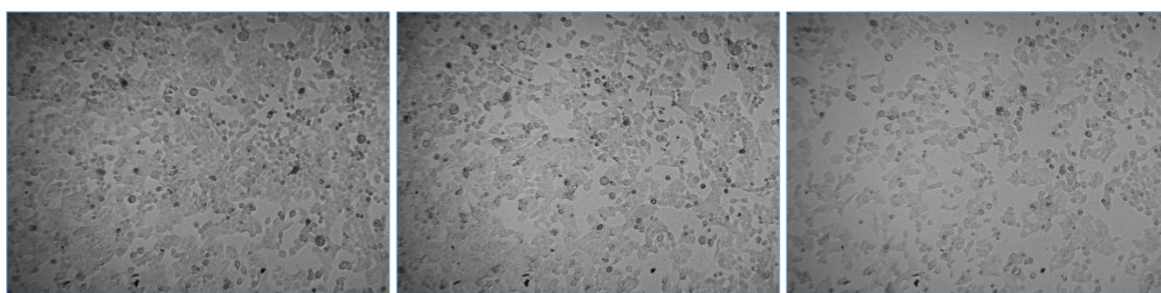


Figure 8: Morphological representation of the KB Oral Cancer cells showing apoptotic changes in the treated group

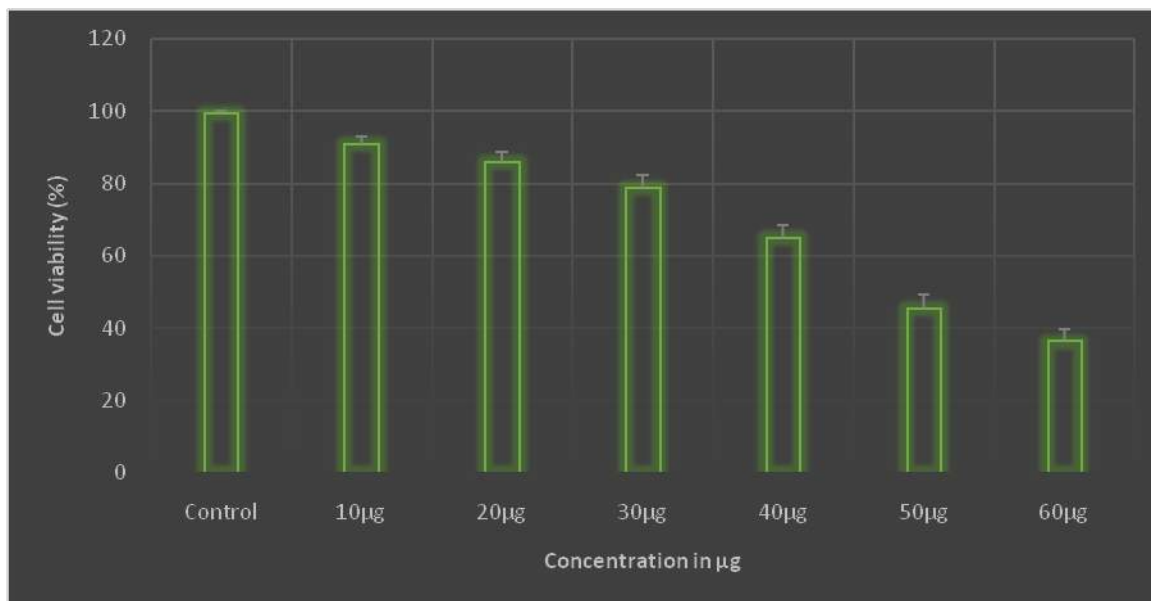


Figure 9: Graphical Representation of Cell viability Assay using MTT Analysis

CONCLUSION:

Historically, plants, herbs and spices were a folkloric source of medicinal agents and as modern medicine expanded, many useful drugs were developed from lead compounds discovered from medicinal plants. This approach has provided against various pharmacological targets including cancer, malaria and pain, and remains an important route to new pharmaceuticals. Recent advances in cytotoxic and phytochemical screening have provided scientists with insight into the bioactive properties of medicinal plants which has led to the development of new medicines. In this study, tulsi plants which are indigenous to South India were screened for their possible antiproliferative and/or pro-apoptotic effect on KB oral cancer cell lines.

After the confirmation that the plant extracts indeed managed to induce significant cell death in the oral cancer cell line tested, we had to verify if the type of cell death induced was due to apoptosis which is genetically controlled or if it was due to necrosis.

Research into the development of novel small-molecule plant-derived extracts and compounds which may prevent carcinogenesis, curtail its progression or even cure the disease is still at the forefront of cancer therapeutics. With studies by Creemers et al. (1994) showing compounds such as irinotecan and topotecan derived from *Nyssacea Camptotheca*

accuminata as the main inducers of apoptosis against colorectal and ovarian cancer. *Kedrostis foetidissima* researchers found to be the most potent of the plant extracts tested has been found to contain cucurbitacins B, D, E, I, J and K by Konopa et al. (1974) . They further went on to show that *K. foetidissima* exhibits high cytotoxicity to Hela and KB human (Konopa et al. 1974) However the synergistic activity of these cucurbitacins need to be studied further to understand their exact activities on the different cancer cell lines. As with all potential anti-tumour agents, it is crucial to understand the molecular mechanism underlying their apoptotic activities. In this study, we concentrated on the two genes BID and BCL2.

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PHYTOCHEMICAL SCREENING AND ANTIBACTERIAL POTENTIAL OF *CITRUS* PEEL EXTRACTS

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ABSTRACT:

The phytochemical and antibacterial activity of four different solvent extracts (Acetone, ethanol, methanol and aqueous) prepared by soxhlet extractor from three different species of *Citrus* (*Citrus aurantifolia*, *Citrus reticulata* and *Citrus aurantium*) were investigated. The preliminary phytochemical analysis revealed the presence of secondary metabolites such as alkaloids, flavonoids, glycosides, phenols, saponins, steroids and tannins. Three *Citrus* peels were tested against four human pathogenic bacteria such as *Escherichiacoli*, *Bacillus subtilis*, *Staphylococcus aureus* and *Vibrio cholerae*. The methanolic extract of *C. aurantifolia* peel exhibited maximum activity against *S. aureus* (13.98 mm). This was followed by an acetone extract of *C. reticulata* against *S. aureus* (12 mm) and the minimum zone of inhibition was noted in aqueous peel extract of *C. aurantium* against *E. coli* with a diameter of 4.26 mm.

KEY WORDS: *Citrus aurantifolia*, *Citrus reticulata*, *Citrus aurantium*, antibacterial, phytochemicals

INTRODUCTION:

Citrus fruit is the most plentiful fruit on the planet, with a high concentration of phytochemicals and bioactive compounds ^[1]. *Citrus* fruit (Hesperidium) is a plant belonging to the Rutaceae family. *Citrus* plants originated from tropical, subtropical and East Asia and it is consumed all over world as an rich source of Vitamin C and other minerals and good source of vitamin A and contains a powerful natural antioxidant antiviral, antifungal and antibacterial activity that builds the strong body immune system. *Citrus* fruit peels are recognized as being a healthful source of bioactive compounds polyphenols, dietary fibre, essential phenolics, and ascorbic acid ^[2]. *Citrus* peels boost antimicrobial activity against pathogenic bacteria, fungi, and viruses ^[3]. *Citrus* peel is produced in large quantities and is considered waste. *Citrus* peels are high in phenolic compounds, including several flavonoid compounds. *Citrus* peel extracts and essential oils have been shown to have biological activities such as antimicrobial and antioxidant properties. Therefore, the current study aimed

to validate the phytochemical screening and antibacterial activities of *Citrus aurantifolia*, *Citrus reticulata* and *Citrus aurantium*

Collection and processing of the plant materials:

The peels of *Citrus aurantifolia*, *Citrus reticulata* and *Citrus aurantium* were collected from Thoothukudi market. After collecting the peels, they were carefully washed with water to remove any dust or foreign materials. The *Citrus* peels were dried under shade and then undergone crushing in an electric blender to form powdered.

Preparation of plant extracts:

10 grams powdered sample was extracted with 200 ml of acetone, ethanol, methanol and aqueous solution using in soxhlet apparatus. The prepared extracts were tested for phytochemical screening and antibacterial activities.

Phytochemical analysis:

The phytochemical tests were done for analyzing different chemical groups present in the extracts. These were done to find out the presence of bioactive chemical constituents such as alkaloid, flavonoids, tannins, phenol, terpenoids, glycosides, cardiac glycosides, anthroquinone, steriods and saponins. Detection of phytochemical constituents was carried out for all the extracts using the standard procedures [4, 5].

Antibacterial activity - Disc diffusion Assay [6].

Antibacterial activity of each *Citrus* peel extracts was analysed using human pathogens., Gram positive bacteria, *Bacillus subtilis* and *Staphylococcus aureus* and Gram negative bacteria *Escherichia coli* and *Vibrio cholerae* obtained from the Department of Microbiology; St. Mary's College (Autonomous), Thoothukudi. Each bacterial pathogen was sub cultured in agar medium and maintained. What man No. 1 sterile filter paper discs (5mm) were impregnated with 2.5 mg/ ml and dried aseptically at room temperature. The spread plates were prepared by proper concentration of inocula. Each sample loaded disc was placed in the seeded agar plate. After 24-48 hours of $\pm 37^{\circ}\text{C}$ incubation, the diameter of the inhibition zone was measured. For positive control, streptomycin disc (100 $\mu\text{g}/\text{ml}$) was used, whereas for negative control, respective solvents were loaded on sterile discs.

RESULT AND DISCUSSION

Phytochemical constituents in peel samples are considered to be biologically active compounds with a variety of functions including antioxidant, antimicrobial, antifungal, hypoglycaemic, anti-diabetic, anti inflammatory, anticarcinogenic, antimalarial, anticholinergic properties. The phytochemical analysis of different peel extracts (acetone, ethanol, methanol and aqueous) of *Citrus aurantifolia* and *Citrus reticulata* and *Citrus*

aurantium were found to contain alkaloids, cardiac glycosides, flavonoids, glycosides, phenols, saponins, steroids, tannins, terpenoids and anthraquinone (Table 1, 2 and 3). Alkaloids were found in various alcoholic and aqueous peel extract of *Citrus aurantifolia* but were absent in ethanolic, methanol, acetone and aqueous extract of *Citrus reticulata* and *Citrus aurantium*. Alkaloids, which make up one of the most diverse classes of phytochemicals found in plants, have remarkable effects on humans, leading to the production of effective pain relievers. However, phenols were detected in acetone, ethanol, methanol and aqueous extracts of *C. aurantifolia* and the glycosides were found in acetone, ethanol and methanolic extract of *C. aurantium*. It was completely absent in ethanol, methanol and aqueous extract of *C. aurantifolia*.

Flavonoids are the pigments that give herbs, fruits, vegetables and medicinal plants their vibrant colours. Flavonoids have a wide range of health - promoting properties in both humans and animals. Acetone and methanol peel extracts of *C. reticulata*, *C. aurantium* and *C. aurantifolia* showed the presence of flavonoids. Flavonoids, are phytonutrients that have anti-inflammatory properties and protect cells from oxidative damage, which can lead to disease. Cardiovascular disease, diabetes, cancer, and cognitive illnesses such as Alzheimer's and dementia can all be prevented by eating antioxidant-rich foods ^[7].

Terpenes, or terpenoids, are the most numerous and diversified group of naturally occurring chemicals. Based on the number of isoprene units they have, they are classified as mono, di, tri, tetra, and sesquiterpenes. They are mostly found in plants and form the major constituent of essential oils from plants. All extracts of *C. aurantium* and *C. reticulata* contained terpenoids. It was not found in aqueous extract of *C. aurantifolia*.

Tannins react with proteins to produce the tanning effect, which is beneficial in the treatment of inflamed or ulcerated tissues. Herbs are those that contain tannins as one of their main components and are used to treat intestinal problems like diarrhoea and dysentery. Tannin was present in acetone, ethanol and methanolic peel extracts of *C. aurantifolia* and was absent in *C. aurantifolia* and *C. aurantium*. Tannins form complexes with proline rich proteins that inhibit cell protein synthesis. Synergistic action of tannins, flavonoids, alkaloids and saponins are known to inhibit the growth of pathogens ^[8]. The saponin content was present in ethanolic extracts of all *Citrus* peels. It was absent in acetone and aqueous extracts whereas, saponin has anti-inflammatory, anti-hepatotoxic, wound healing, veinotonic, expectorant, spasmolytic, hypoglycemic, antimicrobial, and antiviral properties. Tannins,

flavonoids, saponins, phenolic compounds and essential oils are believed to be the phytochemicals responsible for the antimicrobial effects ^[9].

Anthraquinone was completely absent in *Citrus aurantium*, *C. aurantifolia* and *C. reticulata*. All extracts had a higher number of secondary metabolites. Alkaloids, glycosides, tannin, phenols, flavonoids, steroid and saponin are these secondary metabolites found in *Citrus* varieties. They have a high therapeutic value and are commonly used in the pharmacy and drug industries.

Table 1: Preliminary phytochemical analysis of the peel extracts of *Citrus aurantifolia*

(+ : present; - : absent)

S.NO	Phytochemical Test	Acetone	Ethanol	Methanol	Aqueous
1	Alkaloids	+	+	+	+
2	Flavonoids	+	+	+	-
3	Tannins	+	+	+	-
4	Phenols	+	+	+	+
5	Terpenoids	+	+	+	-
6	Glycosides	+	-	-	-
7	Cardic glycosides	+	-	-	-
8	Anthroquinone	-	-	-	-
9	Steriods	+	+	+	-
10	Saponins	-	+	+	-

Table 2: Preliminary phytochemical analysis of the peel extracts of *Citrus reticulata*

(+ :present; - : absent)

S.NO	Phytochemical Test	Acetone	Ethanol	Methanol	Aqueous
1	Alkaloids	-	-	-	-
2	Flavonoids	+	-	+	+
3	Tannins	-	-	-	-
4	Phenols	-	-	-	-
5	Terpenoids	+	+	+	+
6	Glycosides	+	+	+	-
7	Cardic glycosides	-	-	-	-
8	Anthroquinone	-	-	-	-
9	Steriods	+	+	+	-
10	Saponins	-	+	-	-

Table 3: Preliminary phytochemical analysis of the peel extracts of *Citrus aurantium*

(+ : present; - : absent)

S.NO	Phytochemical Test	Acetone	Ethanol	Methanol	Aqueous
1	Alkaloids	-	-	-	-
2	Flavonoids	+	-	+	+
3	Tannins	-	-	-	-
4	Phenols	-	-	-	-
5	Terpenoids	+	+	+	+
6	Glycosides	+	+	+	-
7	Cardic glycosides	-	-	-	-
8	Anthroquinone	-	-	-	-
9	Steroids	+	+	+	-
10	Saponins	-	+	-	-

Antibacterial activity:

In the present study, antibacterial activity of three *Citrus* peel extracts (*Citrus aurantifolia* and *Citrus reticulata* and *Citrus aurantium*) of four different solvents (acetone, ethanol, methanol and aqueous) were tested against four human pathogenic bacteria (*Escherichia coli*, *Bacillus subtilis*, *Staphylococcus aureus* and *Vibrio cholerae*). The bacterial strains were sub-cultured before a day of use to maintain log phase. Agar diffusion method was adopted on pre-seeded nutrient agar spread plates to determine *invitro* bactericidal activity. The antibacterial activities of *Citrus* extracts were visualized as clear zone (inhibition zone) around the disc on agar plates. All the extracts were serially diluted and standardized with above said pathogens and found 2.5 mg/ml to be the effective concentration. Antibacterial activity of three species of *Citrus* peel extracts were presented in table (4 to 6). The diameter of the inhibition zones against these species ranged from 4.26 to 17.22 mm. The study revealed that all extracts inhibited the growth of all the pathogens tested. As shown in Table 4 the methanolic extract of *C. aurantifolia* exhibited maximum activity against *S. aureus* (13.98 mm). The inhibitory effect of *Citrus* peel extract was less in comparison with streptomycin irrespective of the solvent used for extraction. This was followed by acetone extract of *C. aurantifolia* against *V. chlorae* (11 mm). The minimum zone of inhibition was noted in ethanolic extract against *E. coli* with a diameter of 5.61 mm.

These results supported previous studies which have reported that methanol is a better solvent for more consistent extraction of antimicrobial substances from medical plants compared to other solvents, such as water ^[10, 11, 12].

In *C. reticulata* the highest zone of clearance was obtained from acetone extract against *Staphylococcus aureus* (12 mm). Similarly acetone and ethanol extracts of *C. reticulata* inhibited the growth of *E. coli* and *V. cholerae* by showing 10.25 and 9.50 mm of inhibition zone. The moderate sensitivity was noted in ethanolic extract of *C. reticulata* against *E. coli* (8.21 mm). Aqueous extract of *Citrus reticulata* showed less sensitivity and resistant to *E. coli* (4.67 mm).

Bactericidal potential of *Citrus aurantium* was presented in Table (6). More or less all the solvents were proven to be suitable for isolation of bioactive, bactericidal compounds. Methanolic extract of *Citrus aurantium* was apparently more detrimental to *S. aureus* (10.34 mm), where as methanol and aqueous extracts were very active against *E. coli* (8.22 mm) and *V. cholerae* (8.21 mm). According to Cowan (1999), the efficacy of *Citrus* fruit peel is improved by the solvent used; implying that there are some active chemicals in orange peel that have a strong antimicrobial action but are not released unless orange fruit peel is combined with a specific solvent.

Phytochemical constituents of plants such as tannins, alkaloids, flavonoids, phenolic compounds and several other aromatic compounds are secondary metabolites which can be used in achieving a defence mechanism against plundering by many micro-organisms. Activity is elicited by these medicinally bioactive components through a variety of mechanisms. Tannins halt the formation of cell walls by forming irreversible complexes with prolene-rich proteins ^[14]. Saponins have the capability of causing protein leakage ^[15]. Terpenoids compromise the membranous tissue of microorganisms, causing the cell wall to break down ^[16]. Flavonoids have been found to be efficient antibacterial agents against a wide range of pathogens *invitro* and have been generated in response to microbial infection by plants. They can interact with extracellular and soluble proteins, as well as bacterial cell walls, to form complexes ^[17]. Steroids are also known for their antibacterial properties, which are related to membrane lipids and cause liposome leakage ^[18]. As a result, it is concluded that the peel extracts of *Citrus aurantifolia*, *Citrus reticulata*, and *Citrus aurantium* used in this study could be effectively processed and used as a source for antibacterial therapeutic drug preparations.

Table 4: Antibacterial activity of *Citrus aurantifolia* extracted with different solvents against human pathogens

S.No.	Solvent	Inhibition zone (mm)			
		<i>E.coli</i>	<i>B.subtilis</i>	<i>V.cholerae</i>	<i>S.aureus</i>
1	Acetone	9.60±1.69	10.00±1.00	11.00±1.00	7.25±0.88
2	Ethanol	5.61±0.47	6.66±1.24	8.21±1.66	8.77±1.22
3	Methanol	8.00±1.00	5.33±0.05	7.58±0.69	13.98±1.63
4	Water	6.33±0.69	7.58±0.69	6.99±0.25	8.99±1.87
5	Control	14.56±0.89	16.54±1.33	12.00±2.52	17.22±1.68

Table 5: Antibacterial activity of *Citrus reticulata* extracted with different solvents against human pathogens

S.No.	Solvent	Inhibition zone (mm)			
		<i>E.coli</i>	<i>B.subtilis</i>	<i>V.cholerae</i>	S. aureus
1	Acetone	10.25±1.23	7.46±0.42	7.12±1.97	12.00±1.00
2	Ethanol	8.21±1.66	7.42±0.62	9.50±1.96	5.33±0.36
3	Methanol	5.42±0.69	6.36±1.85	5.69±0.55	7.00±1.63
4	Water	4.67±0.23	6.67±0.22	5.72±0.72	6.00±1.06
5	Control	11.56±1.69	16.54±3.33	10.00±1.14	15.63±0.89

Table 6: Antibacterial activity of *Citrus aurantium* extracted with different solvents against human pathogens

S.No.	Solvent	Inhibition zone (mm)			
		<i>E.coli</i>	<i>B.subtilis</i>	<i>V.cholerae</i>	S.aureus
1	Acetone	7.12±0.97	5.33±0.25	5.72±0.72	6.67±0.22
2	Ethanol	6.65±1.36	6.00±0.94	5.69±1.45	7.12±1.97
3	Methanol	8.22±0.98	6.66±0.24	5.42±0.56	10.34±0.58
4	Water	4.26±0.96	6.33±1.69	8.21±1.66	7.46±0.42
5	Control	12.36±1.88	10.58±0.85	16.54±1.33	15.00±1.13

Values are the mean of 3 replicates± SD

Control – Streptomycin (100µg/ml)

Peel extracts - (2.5 mg/ml)

CONCLUSION:

The current study reveals the presence of antimicrobial substances in *Citrus aurantifolia*, *Citrus reticulata* and *Citrus aurantium*. As a result, more research is required to isolate, purify, and characterize these chemical constituents for drug development.

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Phytochemical Analysis and Anti-bacterial activity of Stem of *Jatropha podagrica* and Root of *Jatropha glandulifera*

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ABSTRACT

Plants have been an important source of medicine for thousands of years. Medicinal plants are a source of great economic value. For the present study, the two taxa *Jatropha podagrica* (stem) and *Jatropha glandulifera* (root) were selected. In this study, total phenol, flavonoid, tannin, vitamin C and vitamin E content were quantitatively analyzed in *Jatropha podagrica* stem and *Jatropha glandulifera* root using spectrophotometric methods. The results of this study showed that the *Jatropha podagrica* stem has a significant amount of phenol, flavonoids, tannins, vitamin C and vitamin E and ascorbic acids compared to *Jatropha glandulifera* root. The antibacterial activity of stem of *Jatropha podagrica* and root of *Jatropha glandulifera* extract were nearly similar to ampicillin. Maximum bacterial effects were found *E.coli* in *Jatropha podagrica* stem extract and *Bacillus subtilis* in *Jatropha glandulifera* root extract. The antibacterial activity of various phytochemicals which are known to be synthesized by plants in response to microbial infection.

KEY WORDS: *Jatropha podagrica*, *Jatropha glandulifera*, Anti-bacterial activity.

INTRODUCTION

The medicinal plants play an important role in supporting health care in India. Phytochemicals derived from plants have shown great promise in the treatment of intractable infectious diseases [Nascimento *et al.*, 2000; Rios and Recio, 2005]^[1,2] with lesser side effects compared to the synthetic drug agent (Iwu *et al.*, 1999)^[3]. Some phytochemicals produced by plants have antimicrobial activity and are used for the development of new antimicrobial drugs.

Jatropha podagrica HOOK. belongs to the family of Euphorbiaceae, is a common shrub of Asia, Africa, Latin America and Nigeria. Due to fancy red flower induction, this plant is maintained in the gardens and houses for decorative purposes. *Jatropha podagrica* possesses several phytochemicals like alkaloids, steroids, flavonoids and diterpenoids to

exhibits various biological activities like antiinsect, molluscicidal, antitumour and antimicrobial [Aiyelaagbe *et al.*, 2007]^[4].

Jatropha glandulifera Roxb. is a medicinal plant distributed in the black cotton soil of Deccan and also found in the plains of Northern India [Anonymous, 2001]^[5]. In Tamilnadu, it is found distributed in Chengalpattu, Dharmapuri, Pudukottai, Ramanathapuram, South Arcot, Trichy, Tirunelveli and Thoothukudi. The Seed oil of *Jatropha glandulifera* is used in chronic ulcerations, foul wound ringworm, rheumatism and paralysis. Plant juice is used to remove the film from the eyes. Water extract of the root is given to children suffering from abdominal enlargement. [Senthilkumar *et al.*, 2006]^[6].

The current study of phytochemical analysis and antimicrobial analysis will contribute to the knowledge of the medicinal properties of selected plants.

MATERIALS AND METHODS

Phytochemical Analysis

Water-soluble extract

Two grams of the shade dried powder of the root of *Jatropha glandulifera* and stem of *Jatropha podagrica* were macerated with 50 ml water in a closed flask for 24 hours. Shaking frequently during first 6 hours and allowed to stand for 18 hours. It was filtered using a muslin cloth and used for phytochemical analysis.

Methanol soluble extract

Two grams of the shade dried powder of the root of *Jatropha glandulifera* and stem of *Jatropha podagrica* were macerated with 50 ml methanol in a closed flask for 24 hours. Shaking frequently during first 6 hours and allowed to stand for 18 hours. It was filtered using a muslin cloth and used for phytochemical analysis.

Acetone soluble extract

Two grams of the shade dried powder of the root of *Jatropha glandulifera* and stem of *Jatropha podagrica* was macerated with 50 ml acetone in a closed flask for 24 hours. Shaking frequently during first 6 hours and allowed to stand for 18 hours. It was filtered using a muslin cloth and used for phytochemical analysis.

Ethanol soluble extract

Two grams of the shade dried powder of the root of *Jatropha glandulifera* and stem of *Jatropha podagrica* were macerated with 50 ml ethanol in a closed flask for 24 hours.

Shaking frequently during first 6 hours and allowed to stand for 18 hours. It was filtered using a muslin cloth and used for phytochemical analysis.

Test for tannins (Ciulei)^[7]

To 1 ml of the extract, 2 ml of 5% FeCl₃ was added. A dark blue or green-black indicates the presence of tannins.

Test for saponins (Harbrone)^[8]

Foam test

The crude extract is mixed with 5 ml of distilled water and shaken vigorously, resulting in the formation of stable foam which is a positive indication for saponins.

Test for Flavonoids (Savithrammaet *al* and selvarajet *al.*)^[9,10]

For identification of flavonoids, 2ml of plant extract, 1ml of 2N sodium hydroxide (NaOH) were added. The formation of yellow colour indicates the presence of flavonoids.

Test for Coumarins (Harbrone)^[8]

For identification of coumarins, 1ml of plant extract, 1ml of 10% NaOH was added. The formation of yellow colour indicates the presence of coumarins.

Test for terpenoids (Harbrone)^[8]

For identification of terpenoids, 0.5 ml of the plant extract, 2ml of chloroform along with concentrated Sulphuric acid. The formation of red brown colour at the interface indicates the presence of terpenoids.

Test for Quinines (Egwaikhide and Gimba)^[11,12]

A small amount of extract was treated with concentrated HCl and observed for the formation of the yellow colour precipitate.

Test for Alkaloids (Clarke)^[13]

Wagner's test

A fraction of the extract was treated with Wagner's reagent (1.27 g of iodine and 2 g of potassium iodide in 100 ml water) and observed for the formation of reddish-brown colour precipitate. There was a formation of reddish brown colour confirming the presence of alkaloid.

Test for Sterols (Egwaikhide and Gimba)^[11,12]

Extract (1 ml) was treated with chloroform, acetic anhydride and drops of H₂SO₄ was added and observed for the formation of dark pink or red colour. No dark pink or red colour precipitate, absence of sterols.

Test for Carbohydrate (Harbrone)^[8]**Fehling's test**

5 ml of Fehling's solution was added to 0.5 mg of extract and boiled in a water bath. The formation of yellow or red precipitate indicates the presence of reducing sugars.

Test for Glycosides (Clarke)^[13]

0.5 mg of extract was dissolved in 1 ml of water and then aqueous NaOH solution was added. Formation of yellow colour indicates the presence of glycosides.

Test for Protein (Harbrone)^[8]**Ninhydrin test:**

0.5 mg of extract was taken and 2 drops of freshly prepared 0.2% ninhydrin reagent were added and heated. The appearance of pink or purple colour indicates the presence of proteins, peptides or amino acids.

Test for phenol (Harbrone)^[8]

To 1 ml of the extract, 2 ml of distilled water was added and followed by a few drops of 10% aqueous ferric chloride. The appearance of blue or green colour indicates the presence of phenols.

Anti-bacterial Activity**Extraction of plant materials**

The plant powder was extracted with methanol, ethanol, acetone and water. 25 gms of plant powder was extracted with methanol, acetone and water solution individually in soxhlet apparatus continuously for about 4-6 hours, which was again concentrated till it become semi solid. It was evaporated to dryness and stored at 0 C, until the time of the experiment.

Bacterial strains used

The test organisms were obtained from the Department of Microbiology; St. Mary's College (Autonomous), Thoothukudi. The one gram positive bacteria viz; *Bacillus subtilis* G-ve MTCC 1133 and four gram negative bacteria *Escherichia coli*, G-ve, MTCC 50, *Staphylococcus* G-ve, 737. *Vibrio cholera* G-ve MTCC 3906, were used in the present study.

Broth Medium:

- * Nutrient broth Himedia MOO1
- * Nutrient broth 1.3 gm
- * Distilled water 100 ml

2-3 ml of sterilized broth medium was taken in the culture tube. The inoculating loop was flamed and after a few minutes a loopful bacterial colony was transferred to the broth medium. This microbe culture was incubated at room temperature for 24 hours.

Agar medium:

- * Nutrient broth Himedia MOO1
- * Nutrient broth 1.3 gm
- * Distilled water 100 ml

To prepare the agar medium all the above ingredients were dissolved and sterilized.

Disc diffusion method

Anti- bacterial activity was evaluated by the agar disc diffusion method (Kirby-Bauer *et al.*, 1986). Test solution was prepared with known weight of methanol, ethanol, acetone and water extracts dissolved in 5% dimethyl sulphoxide (DMSO). What man No.1 filter paper disc (5mm) was impregnated with 20 of these extracts and allowed to dry at room temperature. The spread plates were prepared by the proper concentration of inoculate. Each sample loaded discs was placed in the seeded agar plate. 24-48 hours of + 37°C incubation, the diameter of the inhibition zone was for positive control, ampicillin discs (100g/ml) was used, whereas for negative control; respective solvents loaded on the sterile discs.

RESULT AND DISCUSSION

Preliminary phytochemical analysis of the various solvent extracts of of *Jatropha podagrica* and root of *Jatropha glandulifera* showed different results. The alkaloids, phenols, tannin, saponins, glycosides, quinones, flavonoids, terpenoids and coumarins were predominantly present in the solvent extracts.

[Johnson *et al.*,2012]^[14] reported the methanol extracts of some medicinal plants to contain tannin, saponin, flavonoids, phenol, betacyanin and coumarin. [Sukumaran *et.al.*, 2011]^[15] reported the presence of alkaloids, flavonoids, tannins, saponins, phenol and terpenoids in *Peltrophorum pterocarpum* flowers.

Table 1:

SAMPLE	FLAVONOID	PHENOL	TANNIN	VITAMIN C	VITAMIN E
<i>Jatrophapodagrlica</i> (stem)	3.675±1.009	3.867±0.451	1.124±0.02 5	1.389±0.00 4	24.876±8.96 5
<i>Jatrophaglandulife</i> <i>ra</i> (root)	3.453±0.451	2.874±0.014 3	1.119±0.23 9	0.654±0.03 2	21.453±0.23 4

Phenolics are the most widespread secondary metabolites and are believed to be responsible for antioxidant activity. Phenolic compounds are a class of antioxidant agents that act as free Terminators [Shahidi and Wanasundra, 1992]^[16, 17]. Phenolic compounds have a variety of beneficial activities. They have potent antioxidants and free radical scavengers. [Meenakshi *et al.*, 2010]^[18]the antimicrobials (most of the phenolics) may provide a microbe-free environment within the body.

Flavonoids are secondary metabolites and have responsible for antioxidant activity in the medicinal field. Flavonoids are potent antioxidants and epidermic studies indicate that high flavonoids in taking are correlated with decreased risk of lifestyle diseases like diabetes and cardiovascular diseases [Kaur *et.al.*,2008]^[19].

Vitamin C is a vital component in humans. Diet with the highest concentration in animal organs. Vitamin C is a non-enzymatic, water-soluble antioxidant [Ueta *et al.*, 2003]^[20]. Vitamin C function in enzyme activation, oxidative stress reduction, and immune function. It protects against respiratory tract infection and reduces risk for cardiovascular disease and cancer.

Tannins are present primarily in the leaves of trees growing in stressful conditions. They are accumulated in the vacuoles, especially those of the epidermal layer and the palisade layer and the palisade mesophyll. Tannins are useful in treating inflammation, ulcers and remarkable activity in cancer prevention and anticancer activities [Li *et al.*, 2003; Akinpelu *et al.*, 2009]^[21].

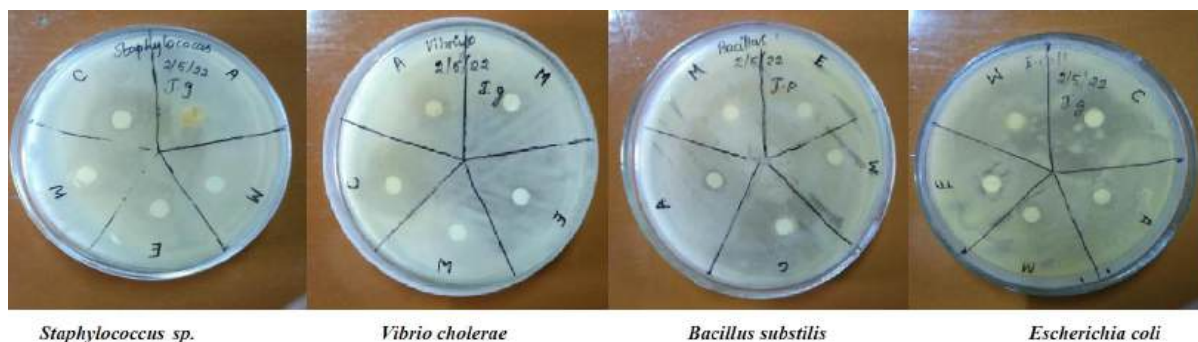
Vitamin E is a fat-soluble nutrient found in many foods [Jacob, 1995]^[22]. In the body, it acts as an antioxidant, helping to protect cells from the damage caused by free radicals are compounds formed when our bodies convert the food we eat into energy [Havsteen, 1983]^[23].

In the present study, the antibacterial activity of different solvents (acetone, ethanol, methanol and water) using *Jatropha podagrica* stem and *Jatropha glandulifera* root were tested against four human pathogenic bacteria (*Bacillus substilis*, *Escherichia coli*, *Staphylococcus sp*, *Vibrio cholerae*) presented in table (1). The diameter of the inhibition zones against these species ranged from (2 to 9).

Figure 1: Antibacterial activity of different solvents extract of *Jatropha podagrica*



Figure 2: Antibacterial activity of different solvent root extract of *Jatropha glandulifera*



The different solvents (acetone, ethanol, methanol and water) extract of *Jatropha podagrica* stem exhibited maximum activity against different bacterial species, *E. Coli* (2-9mm), *Bacillus substilis* (3-7mm), *Vibrio cholerae*, (3-9mm) *staphylococcus sp* (4-8mm) inhibition zone(Fig 1).

The different solvents (acetone, ethanol, metanol and water) extracts of *Jatropha glandulifera* root exhibited maximum activity against different bacterial species, *E.coli*(3-7m), *Bacillus substills*(5-9mm), *vibrio cholera*(3-7), *Staphylococcus sp* (3-7mm) inhibition zone(Fig 2).

Table 2:Antibacterial activity – stem and root extract of *Jatropha podagrica* and *Jatropha glandulifera* with different solvent against human pathogen

Samples	<i>Jatropha podagrica</i>					<i>Jatropha glandulifera</i>				
	A	E	M	W	Amp.	A	E	M	W	Amp.
<i>E.coli</i>	2	5	9	3	11	3	7	5	4	11
<i>Bacillus subtilis</i>	6	5	3	7	9	7	9	5	7	8
<i>Vibrio cholerae</i>	8	7	3	5	14	3	3	7	5	13
<i>Staphylococcus</i>	5	8	4	8	7	6	4	3	7	15

The maximum activity was found to be a 9mm zone of inhibition obtained by methanol extract of *Jatropha podagrica* against *E.coli*. The methanol extract of *Jatropha podagrica* exhibited high antibacterial activity against *E.coli*. The diameter of the inhibition zone was 9mm. The methanol extract of *Jatropha podagrica* exhibited more or less the same zone of inhibition compared to standard antibiotics ampicillin. Maximum bacterial effects were found in *E.coli*. for methanol extracts of *Jatropha podagrica*

The maximum activity was found to be a 9mm zone of inhibition obtained by ethanol extract of *Jatropha glandulifera* against *Bacillus subtilis*. The ethanol extract of *Jatropha glandulifera* exhibited high antibacterial activity against *Bacillus subtilis*. The diameter of the inhibition zone was 9mm. The ethanol extract of *Jatropha glandulifera* exhibited more or less the same zone of inhibition compared to standard antibiotics ampicillin. Maximum bacterial effects were found in *Bacillus subtilis* for ethanol extracts of *Jatropha glandulifera*.

The antibacterial activity of *Jatropha podagrica* stem and *Jatropha glandulifera* root extract were nearly similar to ampicillin. Maximum bacterial effects were found in *E.coli* in *Jatropha podagrica* stem and *Bacillus subtilis* in *Jatropha glandulifera* root extract. The effects were significant in *Jatropha podagrica* and *Jatropha glandulifera*.

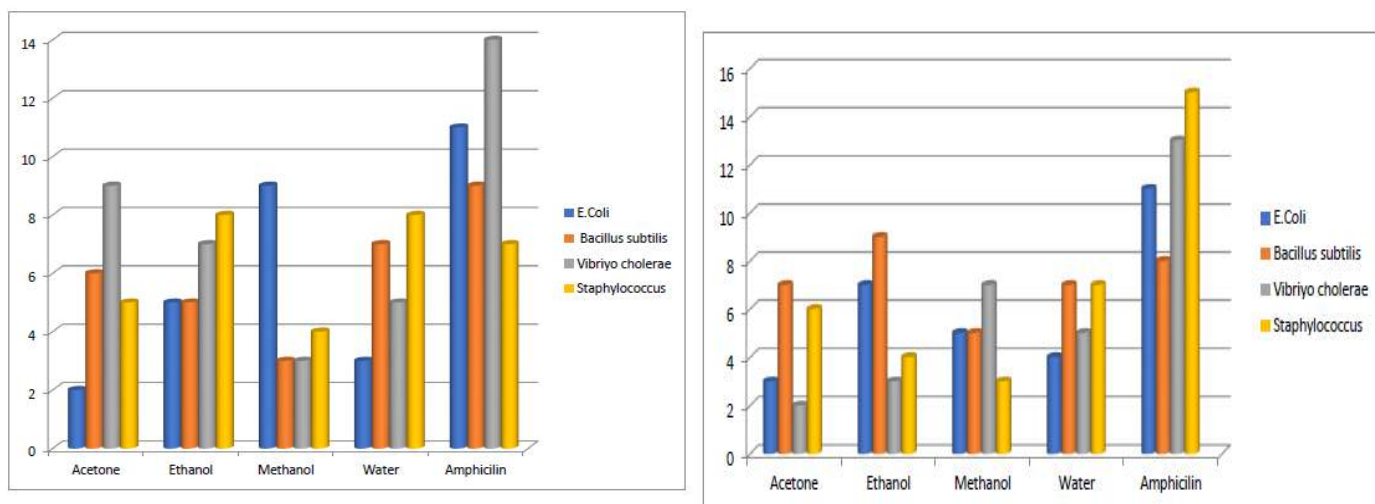


Figure 3: Antibacterial activity of *Jatropha podagrica* and *Jatropha glandulifera* plant extract with different solvent against human pathogen

The antibacterial activities of the stem of *Jatropha podagrica* and root of *Jatropha glandulifera* may be due to the presence of various phytochemicals which are known to be synthesized by plants in response to microbial infection (Cowan,1999)^[24]. The mechanism of action of saponins as antimicrobial agents may be due to membranolytic properties, rather than simply altering the surface tension of the extracellular medium (Killeen,1998)^[25]. In our study stem of *Jatropha podagrica* and root of *Jatropha glandulifera* showed the extracellular saponins. The presences of tannins were also reported in *Jatropha podagrica* and *Jatropha glandulifera*.

The antibacterial activity of tannins may be due to their intercalation with enzymes, cell envelope transport proteins and also complex with cell wall polysaccharides(Ya *et al.*,1998)^[26]. Hence these plants stand as a potential candidate as a source of ingredients in drug formulation for the treatment of bacterial infection.

CONCLUSIONS

The preliminary phytochemical tests are helpful in finding chemical constituents in the plants materials that may lead to their quantitative estimation and also in locating the source of pharmacologically active chemical compounds. The information obtained from the preliminary phytochemical screening will be finding out the genuinity of the drug.

In this study, total phenol, flavonoid, tannin, vitamin C and vitamin E content were quantitatively analyzed in *Jatropha podagrica* stem and *Jatropha glandulifera* root using

spectrophotometric methods. The results of this study showed that the *Jatropha podagrica* stem has a significant amount of phenol, flavonoids, tannins, vitamin C and vitamin E and ascorbic acids compared to *Jatropha glandulifera* root.

The different solvent extracts of *Jatropha glandulifera* root and *Jatropha podagrica* stem and ampicillin were used for antibacterial studies against human pathogenic bacteria, *Bacillus subtilis*, *Escherichia coli*, *Staphylococcus*, *Vibrio cholerae*.

The methanol extract of the stem of *Jatropha podagrica* exhibited high antibacterial activity against *E.coli*. The diameter of the inhibition zone was 9mm. The methanol extract of *Jatropha podagrica* stem exhibited more or less the same zone of inhibition compared to standard antibiotics ampicillin.

The ethanol extract of *Jatropha glandulifera* root exhibited high antibacterial activity against *Bacillus subtilis*, The diameter of inhibition zone was 9mm. The ethanol extract of *Jatropha glandulifera* root exhibited more or less the same zone of inhibition compared to standard antibiotics ampicillin. The antibacterial activity of various phytochemicals which are known to be synthesized by plants in response to microbial infection.

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A COMPARATIVE STUDY ON CULTIVATION OF MUSHROOM USING DIFFERENT SUBSTRATES

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Abstract

In the present study, *Pleurotus ostreatus* mushroom species was cultivated in different waste materials like sugarcane bagasse and coir waste. When compared to sugarcane bagasse, the mushroom grown in coir waste showed tremendous variation in the spawn running time and pin head formation. The qualitative analysis done on the aqueous and ethanolic extracts showed the presence of various secondary metabolites. The carbohydrate, protein and lipid contents were also measured quantitatively. Overall it has been observed that the mushroom grown on the coir waste not only helped to utilize the waste but also shown to have health benefits. Utilizing these waste products as substrates for the production of mushrooms would reduce the adverse environmental effects of these waste products.

Key words: *Pleurotus*, coir waste, sugarcane bagasse, waste, wealth

Introduction

After harvest, crop remnants are prevalent as agricultural trash. In this era of climate change, it is critical to dispose of agricultural waste in a green and environmentally responsible manner. Climate change has already resulted in extreme environmental circumstances ^[1]. The utilisation of organic material in mushroom production is an alternate way of using agricultural residues/wastes ^[2, 3].

Mushrooms are a type of fungus that is meaty and microscopic. They lack chlorophyll and eat in a heterotrophic manner. They make enzymes such as cellulose and hemicellulose, which convert the substrate into usable forms. Mushrooms are saprophytes, meaning they feed on dead stuff ^[4]. Provided the definition that is now widely recognised. They classified mushroom as a "macro fungus with a characteristic fruiting body that can be epigeous or hypogeous, large enough to be seen with the naked eye and pickable by hand." Mushroom cultivation has also been mentioned as a viable means of reducing poverty in developing countries ^[5].

There are many different types of mushrooms around the world, but none of them are fit for human eating. Several wild and farmed mushroom species are edible. In 1997, oyster mushrooms accounted for 14.2% of all edible mushroom production worldwide^[6]. Oyster mushroom cultivation can help manage organic wastes that have become difficult to dispose of^[7]. Straw, sawdust, rice hulls, and other lignocellulose materials can be used to grow oyster mushrooms.

Oyster mushrooms can be cultivated on a variety of lignin and cellulose-rich substrates. The demand for mushrooms among consumers has been steadily increasing. Because substrate plays such an essential role in determining mushroom production, it is crucial to assess various substrates for mushroom yield and to choose the optimal substrate for mushroom growth. The present research work was planned to protect the environment by utilizing the agro waste for mushroom cultivation because it is not only capable of bioremediation of waste but also provides a highly proteinaceous food. Therefore, the present study was carried out with the following objectives: (a) Preparation of substrate for spawn production, (b) Cultivation of *Pleurotus ostreatus*, (c) Study the effect of different substrates on the growth and morphological parameters of *Pleurotus ostreatus*, (d) Qualitative analysis of the fruit body of *Pleurotus ostreatus*, (e) Estimation of carbohydrate, protein, amino acid and lipid content of *Pleurotus ostreatus*

MATERIALS AND METHODS

MATERIALS

Collection of Agricultural Waste

Agro waste materials such as paddy straw, sugarcane bagasse and banana leaves were used as the substrates for the present study. Paddy straw and banana leaves were collected from farmers and sugarcane bagasse was purchased from sugarcane vendors. These substrates were dried and stored. They were used for the experiments.

Spawn

Sorghum grain-based spawn of *Pleurotus ostreatus* was procured for the present study from certified cultivation centre, MSM Mushroom Corner, Mushroom Cultivation Training and Seed Sale, Rediyarpatti, Tirunelveli.

METHODS

CULTIVATION OF MUSHROOM:

In the present study, the edible oyster mushroom *Pleurotus ostreatus* was cultivated using the standard procedure given by Tamil Nadu Agricultural University.

Experimental Design:

In the present study, *Pleurotus ostreatus* was cultivated by bag method using three different agro waste materials as substrates. The composition of the treatments was given below.

- **Treatment 1:** Sugarcane bagasse
- **Treatment 2:** Coir waste

Substrate Preparation:**Soaking:**

The selected agro wastes (paddy straw, sugarcane bagasse and banana leaves) were cut into small pieces (6 -10cm) and soaked in water for 12 – 14 hrs.

Sterilization:

Soaked substrates were sterilized at 121°C for 20-30 minutes by using pressure cooker. After sterilization, the excess amount of water content was removed and cooled down by shade drying in the room temperature.

Bag Preparation:

Before starting the packing, hands were washed thoroughly with the help of antiseptic lotion. Polypropylene bags with the size of 60 x 30 cm and with a thickness of 80 gauges were used for the cultivation. The bottom end of the bag was tied with the help of thread and turned toward the inside.

Layering of Substrate:

The sterilized substrate was filled in the bag to a height of 3 inches. Handful of grain-based spawn was sprinkled over the layer. Likewise, few layers were placed on the bag. Finally, the bag was pressed gently and tied with a thread. Few holes were made on the bags to facilitate ventilation and for the removal of excess water.

Spawn Running:

The spawned bags were kept in a dark room for 1 week to facilitate the spawn running and colonization. Then the bags were transferred to cropping room.

Temperature and Humidity:

The optimum temperature (22°C - 25°C) and required humidity (85%) were maintained by spraying water on the walls of the mushroom unit four to five times in a day.

Harvesting:

After colonization, the mycelium starts to produce its reproductive structure called fruiting bodies. Initially, it looks like a pin head and it was transformed to a full matured fruiting body within two days. After maturity, edges of the pileus start to shrink towards inside. At this stage the fruiting bodies were collected manually and used for further experiments.

SAMPLE PREPARATION FOR BIOCHEMICAL ANALYSIS:

The fruiting bodies were shade dried and powdered with the help of mixer grinder. The powdered sample was sieved to get uniform size particle and stored in an airtight container.

QUALITATIVE ANALYSIS

Phytochemical components of *Pleurotus ostreatus* extracts were investigated. For the same, standard procedures were followed. [8,9,10]

Phytochemical Analysis:**Ethanol Extraction**

Ethanol extract of *P. ostreatus* was prepared using 75% ethanol. Exactly 10 g of the powdered wild oyster mushroom was weighed out into a sterile beaker container containing 100 ml of 75% ethanol, stirred, wrapped with aluminum foil and allowed to stay for 72 hours at room temperature (25°C). After 72 hours, it was filtered and the solvent was heated in a water bath to evaporate completely. The slurry left behind was then stored in McCartney bottles and kept at 4°C until required for use

Aqueous Extraction

A portion (5 g) of powdered mushroom material was soaked in 50 ml of sterile distilled water, stirred and left overnight. After 24 hours, the suspension was filtered using Whatman No.1 filter paper and the filtrate was heated in a waterbath at 70°C to allow the solvent to evaporate to dryness to eliminate the water. The extract was labeled and stored in the refrigerator until required for further analysis

Test for alkaloids

Three tests, Dragendoff's, Mayer's and Wagner's tests were performed for the presence of alkaloids. A 2 ml portion of each extract was stirred with 5 ml of 1% aqueous HCl in water bath. 1 ml of the filtrate of each sample was treated with few drops of Dragendoff's reagent and a second 1 ml with Mayer's reagent. Turbidity and white creamy precipitate was observed in either of those reagents as evidence for the presence of alkaloid. For Wagner's test, a few drop of Wagner's reagent was added to 1 ml of the sample. An orange precipitate appeared indicating the presence of alkaloids.

Test for glycosides**Legal's Test:**

Few drops of 10% NaOH were added to the extract to make it alkaline before the addition of a freshly prepared sodium nitroprusside. Development of blue color indicates the presence of glycosides.

Keller-Killiani Test:

To 5 ml of the extract, 2 ml of glacial acetic acid was added followed by 1 drop of 5% FeCl₃ and then con. H₂SO₄. The appearance of a reddish brown ring at the junction of the two liquid layers indicates the presence of glycosides in the extract.

Test for saponins (Frothing test)

A 2 ml portion of each extract was diluted with 10 ml of distilled water and heated in a water bath. After heating, this was shaken vigorously and left undisturbed for 20 min. A formation of stable froth indicated the presence of saponins.

Test for tannins

Two millimeters of wild edible oyster extract were stirred with 10 mL of distilled water and heated in the water bath. A portion of 1 ml of 1% FeCl₃ was added. Blue-black precipitate or coloration was an indication for the presence of tannins.

Test for reducing compounds**Fehling's Test:**

Two millimeters of wild edible oyster mushroom extracts were put in test tubes and 5 ml of Fehling solution added and heated in the water bath for 5 min. The formation of brick-red precipitation or coloration indicated the presence of reducing sugar.

Molisch's Test:

To 5 ml of each extract, 2 drops of alcoholic solution of α -naphthol was added and the mixture well shaken. This was followed by the addition of 1 mL of conc. H₂SO₄.

The formation of a violet ring in the test tube within few minutes indicated the presence of carbohydrates.

Benedict's Test:

A portion of 1 ml of Benedict's reagent was added to 2 ml of the extract and heated on a water bath for 2 minutes. The development of a characteristic colored precipitate indicated the presence of sugar.

Test for flavonoids (Magnesium hydrochloride reduction test)

A portion of 2 ml of each extract was added to a few pieces of aluminum metal and concentrated HCl added. The formation of orange, red, crimson or magenta colour after few minutes showed the presence of flavonoids.

Test for polyphenol

Two millimeters of wild edible oyster mushroom extract were treated with 5 ml of distilled water and heated for 30 min in a water bath containing 1 ml of 1% Potassium ferrocyanide solution. The formation of green-blue colouration indicated the presence of polyphenol.

Test for anthraquinones

A portion of 2 ml of wild oyster mushroom extract was shaken with 10 ml benzene. This was filtered and 5 ml of 10% NH_3OH was added. The mixture was shaken and the presence of pink/red or violet coloration in ammoniacal (lower) phase indicated the presence of free anthraquinones.

Test for steroids and triterpenoids**Salkowski Test:**

Two millimeters of each extract was treated with few drops of conc. H_2SO_4 , shaken and allowed to stand for few minutes. Formation of a red color at the lower layer indicates the presence of steroids while the formation of yellow colored layer at the interface indicated the presence of triterpenoids.

Libermann Butchard's Test:

The extracts were treated differently with few drops of acetic anhydride, heated and allowed to cool to a temperature of $<40^\circ\text{C}$ in test tubes. The formation of brown ring and green color at the junction of two layers and upper layer respectively on addition of conc. Sulfuric acid indicated the presence of steroids while deep red color indicated the presence of triterpenoids.

Test for proteins and amino acids**Biuret's Test:**

An aliquot of 2 ml of the extracts were first treated with 1 drop of 2% CuSO_4 solution. To this, 1 ml of 95% ethanol followed by excess KOH pellets was added. The formation of pink color in the ethanolic layers indicated the presence of proteins.

RESULTS AND DISCUSSION

Two types of substrates were compared with respect to the production of oyster mushroom. The various substrates used in this study showed variations in spawn run, duration of first fruiting, days to harvest, length of stipe, diameter of pileus, total yield and weight of final substrate.

DAYS FOR THE COMPLETION OF SPAWN RUNNING

On different substrates, the time required to complete spawn runs varies from 22 to 37 days (Figure 1a). According to the findings of this investigation, *P. ostreatus* mycelia grew more quickly on coir (22days). The results of the current study are almost similar to those of the previous study.^[11]

On coir, spawn running day was reported to be between 16 and 25 days. In the case of sugarcane bagasse, the longest spawn running was observed (37days). The results of the spawn run on sugarcane bagasse did not match the report of the spawn run on sugarcane bagasse.^[12] It's possible that the increased number of days for spawn running on lignocellulosic waste materials is due to the mushroom's delayed hyphal growth on substrates^[13].

It's possible that the difference in days for entire mycelia running on different substrates is related to differences in chemical composition.^[14] It was also reported that the spawn running took 16–25 days after inoculation. The variation in the number of days taken for a spawn to complete colonization of a given substrate depends on the function of the fungal strain, growth condition and substrate type.^[15]

Number Of Pinheads

Spawn running day was between 16 – 25 days on coir. The longest spawn running was observed in the case of sugarcane bagasse (37days). The findings of the spawn run on sugarcane bagasse did not agree with the report of researchers^[12] who stated that on sugarcane bagasse, *P.ostreatus* completed the spawn run in 17 days. It's possible that the increased number of days for spawn running on lignocellulosic waste materials is due to the mushroom's delayed hyphal growth on substrates^[13].

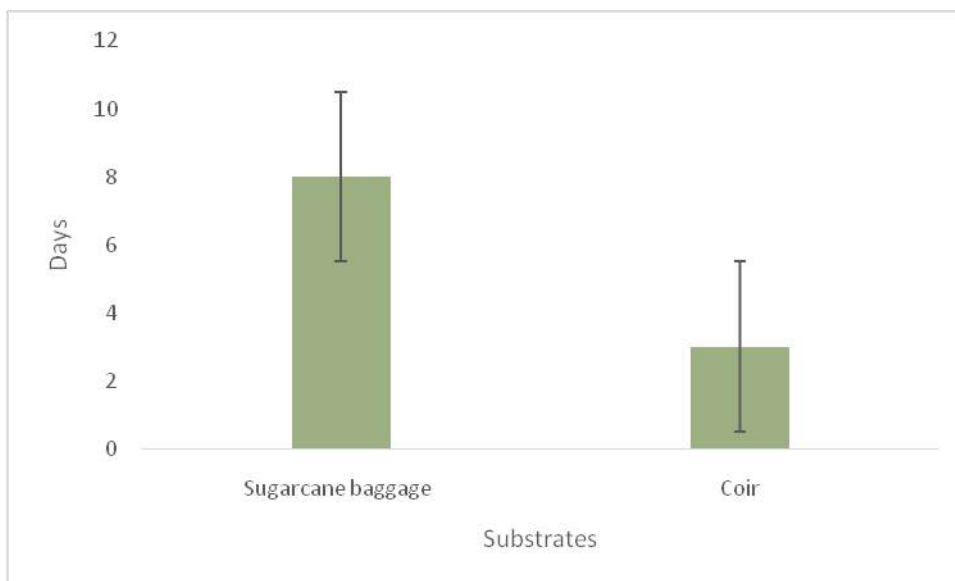


Figure 1a: Effect of Different Substrates on Spawn Running Days of *Pleurotus ostreatus*

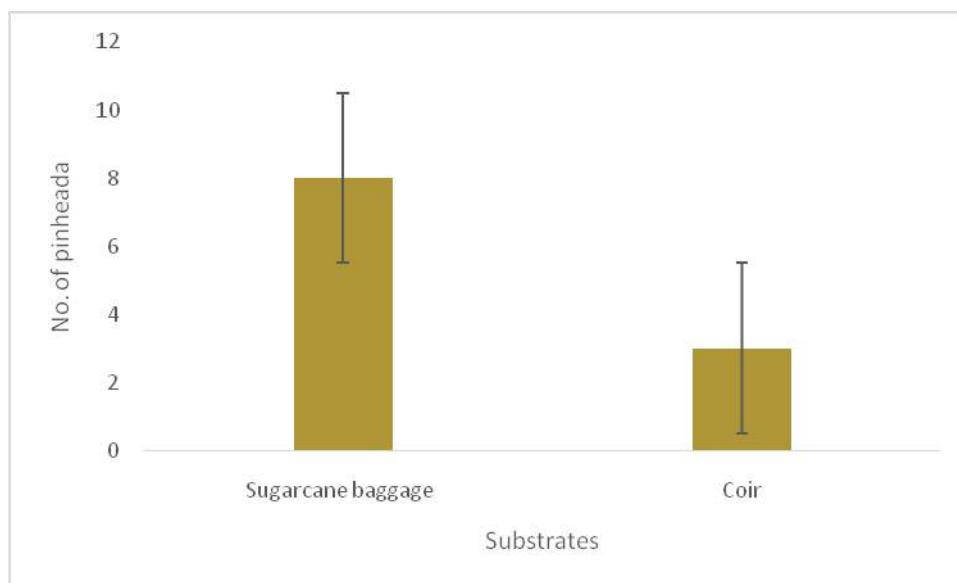


Figure 1b: Effect of Different Substrates on Number of Pinheads of *Pleurotus ostreatus*

After inoculation, it takes 16–25 days for the spawn to run. The amount of days it takes a spawn to colonise a certain substrate varies depending on the function of the fungal strain, growth conditions, and substrate type.

P.ostreatus produced different number of pinheads on different substrates as shown in Figure1b. Maximum numbers of pinheads were recorded on coir followed by sugarcane leaves. Our findings are further supported other researchers too^[17].who reported that highest

number of pinheads of Oyster mushroom was found on coir. Minimum numbers of pinheads were observed on sugarcane bagasse. Almost similar results were observed minimum number of pinheads of Oyster mushroom on sugarcane bagasse ^[18].

QUALITATIVE ANALYSIS

The phytochemical characteristics of *P. ostreatus* of various extracts investigated were summarized in Table. The extracts of *P. ostreatus* revealed the presence of medicinally important bioactive ingredients. The alcoholic extracts of *P. ostreatus* showed the presence of alkaloid, glycosides, Saponin, reducing compounds, steroids, terpenoids and proteins. These phytochemicals have also been observed in mushrooms Some phytochemicals such as steroid, quinone and phytosterol was found of absence in all the extracts investigated in the present study.

S.No.	Phytochemical constituents	Test	Observation	
			Ethanol	Aqueous
1.	Alkaloids	Dragendoff Test	++	-
		Mayer’s Test	++	-
		Wagner’s Test	++	-
2.	Glycosides	Legal’s Test	-	-
		Keller-kiliani Test	+	-
3.	Saponin	Frothing Test	++	++
4.	Flavanoid	Magnesium hydrochloride reduction Test	-	-
5.	Tannin		-	-
6.	Anthroquinones		-	-
7.	Reducing compounds	Fehling’s Test	+	++
		Molisch’s Test	++	-
		Benedict’s Test	++	-
8.	Polyphenol		-	-
9.	Steroid	Salkowski Test	+	++
	Triterpenoid	Libermannbutchard’s Test	++	++
10.	Protein	Biuret’s Test	+	++

‘+’Indicates Presence ‘-’Indicates Absence

CONCLUSION:

Pleurotus fungus has been extensively investigated and farmed in many regions of the world for a variety of purposes. This fungus requires strict environmental restrictions for culture, and its fruiting bodies are rarely affected by diseases or pests, making it straightforward and inexpensive to grow. Another advantage of cultivating oyster mushrooms is that a large percentage of the substrate is transformed to fruiting bodies, which increases profitability when compared to other mushrooms, making *P. ostreatus* a great mushroom cultivar. Using these waste materials as substrates for mushroom production would lessen the negative impact on the environment.

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PHYTOCHEMICAL CONSTITUENTS AND ANTIBACTERIAL ACTIVITY

EVALUATION OF *ACALYPHA INDICA* L.

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Abstract

Medicinal plants have been used for centuries as remedies for human diseases because they contain components of therapeutic value. *Acalypha indica* L. belonging to the family Euphorbiaceae is a common plant used in traditional medicine for treating various ailments. Phytochemical screening of the leaf extracts of *A. indica* was carried out following the standard procedures indicates the presence of tannins, saponins, alkaloids, flavonoids, coumarins, terpenoids, quinine, sterols, carbohydrate, glycoside and phenolic compounds. Leaves of *A. indica* was tested for MIC, MBC and antibacterial activity against *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli* and *Vibrio cholerae*. Results confirm MIC at 4000 µg/mL against all the tested bacteria. Whereas the MBC was 8000 µg/mL. Maximum zone of inhibition was observed against *S. aureus* followed by *E. coli*. *V. cholerae* was least susceptible to the extract of *A. indica*. Ampicillin was used as positive control.

KEYWORDS: *Acalypha indica*, *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli* and *Vibrio cholerae*

INTRODUCTION

Effective treatment is required for the global challenge of antibiotic resistance^[1]. The major problem doctors are experiencing nowadays in providing treatment to patients is the continuous emergence of new strains of bacteria that are resistant to narrow- and broad-spectrum antibiotics resulting in prolonged illness or even death^[2,3]. Antibiotic resistance in bacteria can cause diseases that are even more severe than the nonresistant strains^[3]. This development challenges the scientific community to discover new, safe, and more effective antibiotic compounds from natural sources apart from the existing synthetic antibiotic agents^[4] because almost all available antibiotics cause side effects and are also expensive^[5]. Thus, these considerations make it essential to discover new and more potent antibiotics to address the problem of new and emerging antibiotic-resistant pathogens^[1].

From the beginning of human civilization, nature has been a fundamental source of remedy to many ailments^[6]. Traditional medicines of both plant and microbial origin provide safe remedies against diseases as advocated by the World Health Organization^[7]. Natural

products are helpful in drug development as most clinical drugs originated from natural products^[8] including plant secondary metabolites. Although the main role of these secondary metabolites is defense against plant predators and pathogens,^[9] interestingly, there are now a huge number of reports that explore the activity of these natural products present in leaves and many other plant parts for pharmacological applications including the development of antimicrobial drugs^[10,11].

Acalypha indica is an annual weed, belongs to the family Euphorbiaceae. It is one among the common weed in many parts of Asia, grows in the common farmlands, gardens and roadside waste lands. Parts of *A. indica* used are leaves, root, stalk and flowers. The major phytochemical constituents are alkaloids acalypus and aclyphine^[12]. *A. indica* is used as diuretic, antihelmintic and for respiratory problems such as bronchitis, asthma and pneumonia^[13]. The plant, however, has not been extensively studied in terms of the antibacterial potentials of compounds from its leaves against pathogens, including bacteria. Hence, the present study intends to investigate the phytoconstituents and the antibacterial potentials of the secondary metabolites produced in the leaves of the plant of interest. Results of the study may provide bases for further investigations involving antibiotic-resistant strains of the test organisms.

MATERIALS AND METHODS

Plant material and extraction

Entire plant of *A. indica* was collected from Thoothukudi and the leaves were separated. About 25 g of dry powder was packed in soxhlet apparatus for extraction of respective soluble bioactive molecules from the leaves by the use of different solvents (n-butyl alcohol, isopropyl alcohol, ethanol and water). Fractions containing volatile solvents, were concentrated with the help of evaporator. The concentrated extract was unloaded to sterilized collecting tube and refrigerated for further studies.

Phytochemical analysis

Preliminary phytochemical screening of plant was done following the standard procedures. The extracts were subjected to phytochemical tests for determination of plant secondary metabolites such as tannins, saponins, steroid, alkaloids, terpenoids, protein, carbohydrate, steroids, coumarins, flavonoids, phenolic compounds and glycosides in accordance with Harborne^[14].

Antibacterial activity

Test microorganisms

The standard strains of *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli* and *Vibrio cholerae* were used as test organisms. Cultures of bacteria were grown on nutrient broth (Hi Media, Mumbai) at 37°C for 12–14 h and were maintained and preserved on nutrient agar slants (Hi Media, Mumbai) at 4°C prior to use.

Minimum Inhibitory Concentration (MIC)

The minimum inhibitory concentration of the crude extract was determined according to the method described by the Clinical and Laboratory Standards Institute^[15], with some modifications. Two fold serial dilutions of the extract and antibiotics were made with Mueller Hinton Broth (MHB) to give concentrations ranging from 2000 to 8000 µg/mL for crude extract and 5 to 1000 µg/mL for antibiotics. Hundred microliters of test bacterial suspension were inoculated in each tube to give a final concentration of 1×10^5 CFU/mL. The tubes were incubated for 24 h at 37°C. The control tube did not have any antibiotics or crude extract, but contained the test bacteria and the solvent used to dissolve the antibiotics and extract. The growth was observed both visually and by measuring OD at 600 nm. The lowest concentration of the crude extract showing no visible growth was recorded as the MIC. Triplicate set of tubes were maintained for each concentration of the test sample. Ampicillin were used as positive control.

Minimum Bactericidal Concentration (MBC)

Minimum bactericidal concentration was determined according to the method of Smith-Palmer *et al.*^[16]. About 100 µL from the tubes not showing bacterial growth in the MIC test were serially diluted and plated on nutrient agar. The plates were incubated at 37°C for 24 h. Minimum bactericidal concentration is defined as the concentration at which bacteria failed to grow on nutrient agar inoculated with 100 µL test bacterial suspensions.

Antibacterial assay by disc diffusion technique

The antibacterial activity of the extract was determined by the disc diffusion method^[17] against human pathogenic bacteria. The test cultures maintained in nutrient agar slant at 4°C were sub-cultured in nutrient broth to obtain the working cultures approximately containing 1×10^6 CFU/mL. The MIC concentration of the crude extract was incorporated in a 6 mm sterile disc. Mueller Hinton (MH) agar plates were swabbed with each bacterial strain and the test discs were placed along with the control discs. Ampicillin discs (5 µg/disc) were used as positive control. Plates were incubated overnight at 37°C for 24 h. Clear, distinct zone of inhibition was visualized surrounding the discs. The antimicrobial activity of the test

agents (extract and antibiotics) was determined by measuring the zone of inhibition measured in mm and expressed as diameter in millimeter (mm).

RESULTS AND DISCUSSION

A. indica with different organic solvents like n-butanol, isopropyl alcohol, ethanol and aqueous extracts was used to extract the active compounds for phytochemical analysis and antibacterial activity studies. Phytochemical screening of n-butanol, isopropyl alcohol, ethanol and aqueous extracts of *A. indica* leaves showed the presence of various phytochemical constituents (Table 1).

Table 1 Qualitative analysis of the phytochemical constituents of *Acalypha indica*

Plant used	Solvent	Test for phytochemicals											
		Tannins	Saponins	Flavonoids	Coumarins	Terpenoids	Quinines	Alkaloids	Sterols	Carbohydrates	Glycosides	Proteins	Phenols
<i>A. indica</i> (leaf)	N-butanol	+	-	++	++	-	+	++	-	++	+	+	
	Isopropyl alcohol	+	+	++	++	-	+	++	-	+	++	-	++
	Ethanol	+	-	++	++	++	-	++	+	-	++	-	-
	Aqueous extract	+	-	++	++	++	++	++	+	++	++	++	-

The current investigation reveals the presence of tannins, saponins, alkaloids, flavonoids, coumarins, terpenoids, quinines, sterols, carbohydrates, glycosides and phenolic compounds in n-butanolic leaf extract of *A. indica*. Isopropyl alcoholic leaf extract of *A. indica* confirms the presence of alkaloids, saponins, flavonoids, coumarins, quinines, carbohydrates, glycosides and phenolic compounds. Ethanolic leaf extract of *A. indica* indicates the presence of alkaloids, flavonoids, coumarins, terpenoids, sterols and glycosides. Aqueous leaf extract of *A. indica* confirms the presence of tannins, alkaloids, flavonoids, coumarins, terpenoids, quinine, sterols, carbohydrate, glycosides and protein.

During the investigation, an attempt has been made to decipher the effect of these secondary metabolites towards its antibacterial activities. MIC indicated that the tested crude ethanolic extract of *A. indica* inhibited *B. subtilis*, *S. aureus*, *E. coli* and *V. cholerae* at 4000 µg/mL (Table 2). The crude ethanolic extract of *A. indica* showed an MBC of 8000 µg/mL against all the tested bacterial strains. *B. subtilis*, *S. aureus* and *V. cholerae* were very sensitive to ampicillin with MIC and MBC of 1 µg/mL and 2 µg/mL.

Table 2 MIC and MBC of crude extract of *A. indica* against test bacteria

S. No.	Test organisms	Activity (µg/mL)			
		<i>A. Indica</i>		Ampicillin	
		MIC	MBC	MIC	MBC
1.	<i>B. subtilis</i>	4000	8000	1	2
2.	<i>S. aureus</i>	4000	8000	1	2
3.	<i>E. coli</i>	4000	8000	2	2
4.	<i>V. cholerae</i>	4000	8000	1	2

Table 3 Antibacterial activity of crude extract of *Acalypha indica* against test bacteria

S. No.	Test organisms	Zone of inhibition (diameter in mm)	
		<i>A. indica</i>	Ampicillin
1.	<i>B. subtilis</i>	13±1.1	27±1.2
2.	<i>S. aureus</i>	16	25±1
3.	<i>E. coli</i>	15	25±1.4
4.	<i>V. cholera</i>	12±1.3	22±1.2

The antimicrobial activity of crude ethanolic extract of *A. indica* against the tested bacteria were depicted in Table 3. All the tested bacterial strains were sensitive to *A. indica*. The zone of inhibition varied between 12 to 16 mm. *S. aureus* was highly sensitive with the maximum zone of inhibition 16 mm. The least activity was recorded against *V. cholerae*. *E. coli* was moderately inhibited. Terpenoids are large and diverse class of naturally occurring organic chemicals found in all classes of living organisms. The presence of terpenoids in the leaf extract of *A. indica* as indicated in this study is in agreement with the wide distribution and antibacterial properties of this compound reported by Nostro *et al.*^[18]

and Edeoga *et al.*^[19]. Cardiac glycosides are drugs used in the treatment of congestive heart failure and cardiac arrhythmia and are found as secondary metabolites in several plants like *Digitalis sp.*, *Convallaris*, *Euphorbia sp.*,^[20]. Phytochemical screening of *A. indica* leaves by Oudhia^[7] reported *A. indica* are very rich in tannins, saponins, terpenoids, alkaloids and phlobatanins which are best known for their antimicrobial and antiviral properties. Rajaselvam *et al.*^[21] assayed acetone and aqueous extract of *A. indica* for its antibacterial activity against *S. aureus*, *B. subtilis*, *E. coli* and *Klebsiella sp.*

Prithiksha *et al.*,^[22] compared to root, stem and leaves of hydroethanolic extract of *A. indica*, leaf showed maximum inhibition against *E. faecalis*. As the concentration of extract increases from 25 µg/mL to 100 µg/mL, the zone of inhibition also increases. This shows the antimicrobial activity is better at higher concentration. Aqueous extraction of *A. indica* leaf and whole plant were investigated for anti-microbial property by Prabagar *et al.*,^[23]. Results revealed that all extracts had good inhibitory activity against gram positive and gram negative bacteria like *S. aureus* and *Klebsiella sps.* *A. indica* crude extract was evaluated by Priya *et al.*,^[24] and reported significant phytochemicals and antibacterial activity substance for the control of numerous antibiotic resistance bacteria such as *Escherichia coli*, *Salmonella typhi*, *Staphylococcus epidermidis*, *Bacillus cereus*, *Staphylococcus marcescens*, *Staphylococcus aureus*, *Streptococcus agalactiae*, *Streptococcus pyogenes* and *Streptococcus dysgalactiae*.

The isolation of individual phytochemical constituent and subjecting it to biological activity will definitely give fruitful results. It could be concluded that, *A. indica* contains various bioactive compounds. So it is recommended as plant of pharmaceutical importance. However, further studies are needed to undertake its bioactivity and toxicity profile.

SUMMARY AND CONCLUSION

A. indica was studied for their phytochemical analysis reveals the presence of different constituents such tannins, saponin, alkaloids, flavonoids, coumarins, terpenoids, quinine, sterols, carbohydrate, glycoside, protein and phenolic compounds. Phytochemical analysis shows that ethanolic extract had more active compounds, aqueous extract and isopropyl alcohol extracts having moderate active compounds and n-butyl alcohol extract has least active compounds. MIC reveals that the inhibition was noticed at 4000 µg/mL and MBC was 8000 µg/mL in *A. indica*. The zone of inhibition ranged between 16 -20 mm. In *A. indica* the zone of inhibition was recorded between 12-16 mm inhibiting all the tested bacterial strains.

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**A STUDY ON GREEN HUMAN RESOURCE MANAGEMENT AT DCW
LIMITED**

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ABSTRACT

Over the decades, the environmental degradation is hitting the headlines all around the sphere. The concept of concern for environment seems to have an expansive significant role for eco-friendly practices with a current impulse of go green concept in HRM. Green HRM is a key business roadmap carving footprint in 'Going-green'. Also, recently the researchers heightened their research interest towards the environmental management and sustainable development goals. 'Going-green' is the only way to save our endangered environment and it seems to be a novel concept in today's hyper changing environment. Green HRM has evolved in the context of HRM field in order to protect and preserve the natural resources and to attain the sustainable development goals. Launching green HRM policies and investing in green technology is mushrooming among the business professionals, banking industries, hospitals and academic institutions etc., This paper is based on the collection of relevant review of literature in recent research studies.

INTRODUCTION

Green Human Resources Management (GHRM) can be defined as a set of policies, practices, and systems that stimulate the green behavior of a company's employees in order to create an environmentally sensitive, resource-efficient, and socially responsible organization. Green human resource management is a global environmental concern and the development of environmental standards that are creating the need for businesses to adopt formal environmental strategies and programmed where the employees must be inspired, empowered and environmentally aware of Greening in order to carry out green management initiatives. Green Human Resource Management is a contemporary management construct, initially designed and developed because of its potential to influence employees' green behavior. Green HR is the utilization of HRM approaches to advance the feasible utilization of assets inside business associations and, more generally, promotes the cause for natural sustainability. Green activities inside HRM shape some portion of more extensive projects of

corporate social obligation. Green HR includes two fundamental components: Environmentally friendly HR practices and the protection of Knowledge capital.

Green human resource management (GHRM) involves the alignment of the firm's HRM practices to the environmental management system. However, the specific impact of GHRM practices on employees' pro-environmental behaviors, most especially in the information 2 technology domain has not been fully clarified. Organizational management practices have witnessed immense transformation over the past several years. Green HRM is defined as an environment friendly HR practice that subscribes to the sustainable use of resources in the industrial sectors all over the world. Green HRM connotes the science and the art of practicing environmental management in business organizations. Corporate environmental management essentially implies achieving minimum or zero destruction of the environment in its production and service activities. The United Nation's World Commission on Environment and Development (WCED) called for a report in the 1990's to investigate the condition of the world's resources. The report by Brundtland highlighted the importance of HRM to build a sustainable competitive advantage. It is acknowledged within the report that it is difficult to transform traditional policies, processes and practices without developing and converting the attitudes of an organization's workforce. The Brundtland report defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This definition has become one of the most cited sustainability definitions within current environmental literature. The emotive sentiment generated from the findings of the report has motivated a number of contemporaneous interpretations of sustainability, as well as significantly influencing the emergence of contemporary management constructs within the green management domain. Green HRM began its journey through the milieu of green management applications, in order to address the growing concern from corporate stakeholders, in response to the negative impacts of organizational operations on the environment. By embracing green management policies and strategies, and Green HRM practices and processes, firms are expected to receive direct and peripheral gains such as improved sales, productivity gains and competitive advantages. In addition, advantageous employee behaviors and increases in corporate efficiencies including improvements in water and energy usage and waste reduction, are likely to occur. As it is employees who are the agents that implement organizational green policies, it is necessary for organizations to promote and ultimately seek to manage and change employee behavior so that they are aligned with organizational green goals. Increasingly, organizations are considering the adoption of Green HRM practices, i.e.,

‘HRM aspects of green management’, to promote employee green behavior in the workplace. However, despite increasing levels of 3 academic literature conceptualizing the anticipated correlations between Green HRM and employee green workplace behavior, this linkage has not yet been sufficiently empirically explored.

OBJECTIVES

- ✦ To study and examine the green human resource policies and practices in the organization.
- ✦ To study the transformation of the organization after green human resource policies.
- ✦ To find out the limitations or barriers to its successful implementation of green HRM.
- ✦ To come across the reasons why we need to adopt Green HRM.

REVIEW OF LITERATURE

According to **Renwick**, the integration of Corporate Environmental Management into Human Resource Management is termed as green HRM. These scholars broadly specified that distinguished policies in the field of recruitment, performance management and appraisal, training and development, employment relations and pay and reward are considered powerful tools for aligning employees with an organization’s environmental strategy.

According to **Jabbour, Santos, & Nagano** the greening of functional dimensions of human resource management such as job description and analysis, recruitment, selection, training, performance appraisal and rewards is defined as green HRM.

In 2011, **Jabbour** again defined green HRM as „the level of greening of human resource management practices“ in terms of functional and competitive dimensions of HR. Others describe Green HRM as the use of HRM policies, philosophies, and practices to promote sustainable use of business resources and thwart any untoward harm arising from environmental concerns in organizations.

Mandip is of the opinion that green initiatives within HRM form part of wider programs of corporate social responsibility. Green HR essentially consists of two major elements that are environment-friendly HR practices and the preservation of knowledge capital.

CherianandJacob in their study identified that recruitment, training, employee motivation, and rewards are important human dimensions which contribute to the improvement in employee implementation of green management principles.

CONSTRUCTION OF TOOLS

The project material has been collected through the source of Primary and Secondary data. Primary data was collected from the employees through questionnaires. Secondary data was collected from the official website of company.

Statistical tool:

- Percentage analysis
- Graphical method

Sampling design

By adopting Random sampling method, a sample of 50 respondents were selected from DCW Limited, Sahupuram. And the questionnaire was distributed to get the primary data from them.

TABLE 1.1

THE IMPLEMENTATION OF PAPERLESS WORK

S.no	Responses	No. of respondents	Percentage
1	0-25%	7	14
2	25-50%	15	30
3	50-75%	20	40
4	75-100%	8	16
	Total	50	100

INFERENCE

From the above table 40% of respondents stated that 50-75% of paperless work implemented in the office, 30% respondents stated that 25-50% of paperless work implemented in the office.

TABLE 1.2

THE INTERNAL EFFORTS TO PROTECT ENVIRONMENT

S.no	Responses	No. of respondents	Percentage
1	Tree plantation	7	14
2	Carpool for offices	3	6
3	Video conferencing	14	28
4	Rain water harvesting	10	20
5	Educate people about environment	2	4

	protection		
6	Organize seminar, workshop etc.	3	6
7	Use of LPG in office vehicle	6	12
8	Sponsor national events in environment protection	5	10
	Total	50	100

INFERENCE

From the above table 14% of respondents choose tree plantation, 10% of respondents choose sponsor national events, 6% of respondents choose organize seminar, workshops, 4% of respondents choose educate people about environment protection, 20% of respondents choose rain water harvesting, 28% of respondents choose video conferencing, 6% of respondents choose carpool for offices, 12% of respondents use LPG vehicle to protect environment.

TABLE 1.3

THE EXISTENCE OF ENVIRONMENTAL MANAGEMENT SYSTEM

S.no	Responses	No. of respondents	Percentage
1	Currently exist	11	22
2	No plans to implement	12	24
3	Plan to implement within 12 months	11	22
4	Plan to implement in more than 12 months	6	12
5	Unsure	10	20
	Total	50	100

INFERENCE

From the above table 22% of the respondents stated plans to be implemented within 12 months, 24% respondents stated no plans to be implemented, 22% of respondents stated currently exist, 20% of respondents stated unsure about the plan, 12% respondents stated plans to be implement more than 12 months.

TABLE 1.4

LEVEL OF PLASTIC FREE ZONE IN THE ORGANIZATION CAMPUS

S.no	Responses	No. of respondents	Percentage
1	0-25%	7	14
2	25-50%	6	12
3	50-75%	17	34
4	75-100%	20	40
	Total	50	100

INFERENCE

From the above table 40% of respondents stated the level of plastic free zone is 75-100%, 34% of respondents stated the level of plastic free zone is 50-75%, 14% of respondents stated the level of plastic free zone is 0-25%, 12% of respondents stated the level of plastic free zone is 25-50%

TABLE 1.5

PREFERENCE FOR SAVE ELECTRICITY

S.no	Responses	No. of respondents	Percentage
1	Solar	18	36
2	Government electricity	24	48
3	Others	8	16
	Total	50	100

INFERENCE

From the above table 48% respondents preferred government electricity, 36% of respondents preferred solar and 16% of respondents preferred others for saving electricity.

TABLE 1.6

IS THE TOP MANAGEMENT ACTIVELY SUPPORT ENVIRONMENTAL PRACTICES

S.no	Responses	No. of respondents	Percentage
1	Yes	43	86
2	No	7	14
	Total	50	100

INFERENCE

From the above table 86% of respondents agreed that the top management actively supports the environmental practices and 14% of respondents did not agree that the top management actively supports environmental practices.

TABLE 1.7

THE DEPARTMENTAL BUDGETS COVER ENVIRONMENTAL IMPACT

S.no	Responses	No. of respondents	Percentage
1	Not at all	20	40
2	To a slight degree	17	34
3	To a moderate extent	10	20
4	To a great extent	3	6
	Total	50	100

INFERENCE

From the above table 6% of respondents stated to a great extent that the departmental budgets cover environmental impacts, 20% of respondents stated to a moderate degree, 34% of respondents stated to a slight degree and 40% of respondents stated not at all that the departmental budget cover environment impact.

FINDINGS

- ✦ Most of the representatives have responded that application of green HRM can bring about a drastic change in the company environment.
- ✦ The main barrier for implementing GHRM practices was the cost involved for the program.
- ✦ Organization needs to bring in green policies and programs that are holistic. All stakeholders at different levels should work together to achieve a green balance.
- ✦ Creating green culture is not easy to plan, coordinate and execute.
- ✦ It really finds tough to implement all green indicators, green technology and green components in manufacturing unit.

SUGGESTION

- ✦ Representatives can be offered opportunity to adjust or make new procedures which are eco well-disposed inside association structure and strategy.
- ✦ Focus on recycling, it will reduce the amount of wastage and pollution.

- † Use online system in the organizational activities to make your organization eco-friendly.
- † Use organization's transport in group rather than privately to ensure less emission of different harmful gases to the atmosphere.
- † Install heat management system to ensure comfortable temperature in the organization and surrounds.
- † Conduct annual survey on measuring the level of green practice adopted by the organization.

CONCLUSION

Nowadays, Organizations are trying to focus on profit maximization and environmental obligation. In here, more investment on environmental issues will cause profit minimization. In that case, non-financial practice like green human resource management can be implemented in the organization. Financial help to a part of the total population of a country may get less focus than being green through green human resource management. Higher focus will create higher acceptance. Higher focus will facilitate an organization to maximize their profit in long run. In this way cooperate social responsibility can be performed through green human resource management.

At present, human resource plays a vital role in managing employee from entry to exit. Organizations should provide proper training to the employees and influence them to adopt green human resource management. The Green Human Resource Management has the responsibility to create green awareness among the new talent and the existing employee working for an organization, encourage their employees for helping the organization to reduce the causes of environmental degradation through green movement, green programs and practices, retain the resources for future generation.

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A STUDY ON CHANGE MANAGEMENT IN VASPAL SALT & CHEMICAL PRIVATE LIMITED

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Abstract

Change management is the process, tools and techniques to manage the people side of change to achieve the required business outcome change management incorporates the organisational tools that can be utilize to the individuals make successful personal transitions resulting in the adoption and realization of change.

Vaspal salt and chemicals has the unique ability to service their customers anywhere in the world globally consistent product, innovative service, creative ideas and superior team solutions.

The study concluded that structural changes, leadership, technology and organisational culture influence the performance of employees positively. The study recommended that the company leadership needed to change their mindsets on the impact of change management, leadership styles that increase employee motivation to exceed expected results and a change process that is result oriented thus increasing their levels of employees performance.

INTRODUCTION

Change Management

Change management is the discipline that guides how they prepare equipments and support individual to successfully adopt change in order to drive organizational success and outcomes.

Change management provides a structured approach for supporting individuals in their organization to move from their own current states to their own current states to their own future states.

Change management is the process, tools and techniques to manage the people side of change to achieve the required business outcome. Change management incorporates the

organizational tools that can be utilized to help individuals make successful personal transitions resulting in the adoption and realization of change.

STATEMENT OF THE PROBLEM

The reality is, no matter how successful you are, you can always do something better. For example you can improve your product, streamline a process, or optimize a service offering. Factors like evolving market conditions, new competitors, and new technologies only add urgency. Failure to change allows more nimble competitors to get ahead. Planning for change and make it part of your culture makes it easier to adapt and stay competitive and agile. Of course, change presents a challenge, doesn't it? We don't like it. We prefer the comfort of our routines. This preference can make it difficult to change. As a result, even the most inspired business leaders in companies of every size face a path full of potential roadblocks when proposing a change.

REVIEW OF LITERATURE

Hennystewart (2003) This article summarize that, while change must be well managed, it also requires effective leadership to be successfully introduced and Sustain. An integrative model of leadership for change is proposed, reflecting its cognitive, spiritual, emotional and behavioural detention requirements. The model comprises vision, values, strategy, empowerment and motivation and inspiration.

Marie H. Kavanagh(2003)This article reports a longitudinal study that examined mergers between three large multi-site public sector organizations. Both qualitative and quantitative methods of analysis are used to examine the effect of leadership and Change management strategies on acceptance of cultural change by individuals.

Nicolay A.M. Worren(2004) The articles describe the emergence of change management as a service offering of major consulting firms. The authors compare change management 3with individual organizational development (OD) in terms of theory and analytical frame work, the role of the interventionist, and intervention strategies. They argue the change management has the potential to become a discipline that can unities the different “through words” operating in the field of planned organizational change.

OBJECTIVES OF THE STUDY

Primary objectives:

To study the impact of change management towards the employees in Vaspal Salt & Chemicals Thoothukudi.

Secondary objectives:

1. To identify the reasons for the change in the organisation
2. To identify the perception of employees related to change
3. To evaluate the leadership qualities during the change
4. To assess the success success of the change and their implementation
5. To assess the impact of change management on the performance of employees

DATA ANYALYSIS AND INTERPRETATION

Analysis of data means, studying the tabulated material in order to determine inherent facts or meanings. Larger divisions of material should be broken down into smaller units and rearranged in new combinations to discover new factors, interrelationship and cause effect relationships.

Analysis of data is the most skilled task of all the stages of research, calling for the researcher's own judgment and skill. It throws light on the various problem areas, enabling the researcher to identify ways and means of arriving at a solution. A researcher besides the collection and analysis of data has to draw inferences and explain their significance. The task of drawing conclusions and inferences from a careful analysis of data is known as interpretation.

Table 4.1.1**Table showing the usefulness of change**

S. No	Particulars	No. of respondents	Percentage
1.	Developed skills	25	50
2.	Increased output	20	40
3.	Easy to work	5	10
	Total	50	100

Source: Primary data

Inference

From the above table it is observed that 50% respondents express that change develops their skills, 40% respondents state it increases output, 10% respondents state it is easy to work.

Table 4.1.2 Table showing employees reaction regarding initial change

S. No	Particulars	No. of respondents	Percentage
1.	Anger	21	42
2.	Confused	24	48
3.	Others	5	10
	Total	50	100

Source: Primary data

Inference

The above table 42% respondents state that the reaction is anger regarding initial change, if there is an initial change, 48% respondents express they are confused why change is needed, 10% respondents state there are other reactions

Table 4.1.3

Table showing response to change that will increase profit of the organization

S. No	Particulars	No. of respondents	Percentage
1.	Strongly agree	23	46
2.	Agree	22	44
3.	Neutral	3	6
4.	Disagree	2	4
	Total	50	100

Source: Primary data

Inference

From the above table it is inferred that 46% of the respondents strongly agree that the change will increase the profit of the organization, 44% respondents agree to it, 6% respondents give a neutral opinion and 4% respondents disagree.

FINDINGS

- From the study 50% of the respondents say that the changes will be useful to Develop the skills of an employee.
- It shows that 48% of the respondents say that employees are confused when Initial change happens in the organization.

- It is found that 46% of the respondents strongly agree that change will increase the profit of the organization.

SUGGESTIONS

- The organization may conduct meetings to inform employees about the change.
- The company can maintain a good relationship with employees to achieve the goals.
- Management should give clear information regarding technology change so that it will be easy for the employees to correct the errors.
- The organization must provide good working condition for employees to work during the change.

CONCLUSION

Change Management provides a structure approach for supporting individual in their organization to move from their own current states to their own future states. Organizational change takes place for a number of reasons. Often this is because of changes in the internal and external environment. Organizations implement changes to increase the effectiveness of the business.

From this study it is understood that, employees are learning new skills and knowledge for change, and this change will increase the workers performance level in the organization. So it used to increase the profit level in the organization. But many employees are not aware of company's changes so the organization must give clear information before the change, so it useful for achieving the organizational goals.

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GREEN SYNTHESIS AND CHARACTERISATION OF CADMIUM SULPHIDE VANADIUM DOPED CADMIUM SULPHIDE NANOPARTICLES USING MONOON LONGIFOLIUM LEAF EXTRACT

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Abstract

The plant sources can act as potential precursors for the synthesis of nanoparticles in non-hazardous ways as plants contain various secondary metabolites. The green synthesized nanoparticles have been proven to control various diseases with less adverse effect. Thus, in this study, the green method for the preparation of cadmium sulfide nanoparticles using *Monoon longifolium* has been adopted. The synthesized undoped CdS and V doped cadmium sulphide nanoparticles were evaluated for their optical, structural, surface morphological and antibacterial properties. The CdS nanoparticles were characterized by different techniques including UV–vis spectrophotometry, fourier transmission infrared spectroscopy (FT-IR), X-ray diffraction analysis (XRD), scanning electron microscopy (SEM). The antibacterial activity against *Staphylococcus aureus* and *Escherichia coli* was also carried out. The XRD pattern revealed the crystalline structure of CdS nanoparticles. The SEM analysis showed the size and shape of the nanoparticles. The presence of (OH) and carboxylic functional groups were confirmed by FTIR analysis. The ecological friendly methods can generate simple, easy and cost-effective nanoparticles..

Keywords, CdS, V doped CdS, Monoon longifolium, green synthesis.

1.INTRODUCTION

1.1 Nanotechnology

Nanoparticles have attracted great interest due to their unique physical and chemical properties, which are different from those of either the bulk material or single atoms. ^[1] The field of nanotechnology is one of the most active areas of the research in modern material sciences. ^[2] The synthesis of metal nanoparticles using bio inspired, eco friendly greener methods is one of the most attractive aspects of current nanoscience and nanotechnology Much research work have been reported in the synthesis of nanoparticles using plant extract, bacteria and fungi. It is also found that plants are advantageous for the production of nanoparticles as they are easily available, safe to handle. ^[3]

The present investigation was made to synthesize CdS and V doped CdS by green synthesis using the leaf extract of *monoon longifolium*

1.2 Green synthesis

The green route of nanoparticle synthesis is greatly interest due to eco-friendliness, economic prospects ,feasibility and wide range of applications in nano medicine , catalysis medicine , nanphoto electronics ,etc. It is a new and emerging area of research and scientific world , where day-by-day development is noted in warranting a bright future for this field.

1.3 V doped CdS nanoparticles

Vanadium is used in the alloys,colouring compounds ,batteries and dye fixants and vitamins .it can be doped with cadmium.

2.MATERIAL AND METHODS

2.1 MATERIALS

Monoon longifolium leaves, Cadmium acetate, Vanadium pentoxide, Sodium sulphide

2.2 METHODS

Preparation of polyalthia longifolia leaves extract

10g of fine cut leaves of polyalthia longifolia was washed .The leaves were taken in 500 ml glass beaker along with 300 ml of sterile distilled water .The mixture was then boiled for 60 minutes until the colour of aqueous solution changes from colourless to light yellow . The extract was cooled to room temperature and filtered using filter paper .The extract was stored in refrigerator in order to be used for further experiment.

Preparation of cadmium sulphide nanoparticles

5.5g of Cadmium acetate was dissolved in 100mL of polyalthia longifolia leaf extract in a beaker. This solution was kept under constant stirring till CdS totally dissolved in the leaf extract . After 5minutes 5g of sodium sulphide was dissolved in 25mL of distilled water in a separate vessel. From the prepared Na_2S is added to the beaker with constant stirring drop by drop touching the walls of the beaker with half- an hour .The light green solution turned into a yellow precipitate .The reaction produced for 3hours. After the complete reaction , the precipitate was washed with distilled water and ethanol .after complete washing the cadmium sulphide nanoparticles were dried at 80°C for 1 hour and then it was mashed in a mortar-pestle .The yellow colour powder of cadmium sulphide nanoparticle was formed.

Preparation of vanadium doped cadmium sulphide nanoparticles

5.5g of Cadmium acetate was dissolved in 100mL of polyalthia longifolia leaf extract in a beaker. This solution was kept under constant stirring till Cadmium acetate totally dissolved in the leaf extract. 50mL of vanadium pentoxide was added. After 5 minutes 5g of sodium sulphide was dissolved in 25mL of distilled water in a separate vessel. From the prepared Na_2S is added to the beaker with constant stirring drop by drop touching the walls of the beaker with half- an hour .The light green solution turned into a dark green precipitate .The reaction produced for 3 hours. After the complete reaction , the precipitate was washed with distilled water and ethanol .After complete washing the cadmium sulphide nanoparticles were dried at 80°C for 1 hour and then it was mashed in a mortar-pestle .The Dark green colour powder of cadmium sulphide nanoparticle was formed.

3.RESULTS AND DISCUSSIONS

3.1 UV-visible Absorption spectroscopy

3.1.1 For undoped CdS nanoparticles

The UV-Vis spectrum of CdS nanoparticles synthesized using reverse micelle was shown in Fig The spectrum was recorded in the range 200-900nm .The absorption wavelength is distinctly different from bulk material .An absorption maximum is obtained at 290 nm and the blue shift is attributed to the smaller size of nanoparticles .This indicates the formation of smaller particles. The band gap energy of CdS nanoparticles synthesized 4.2758e.V

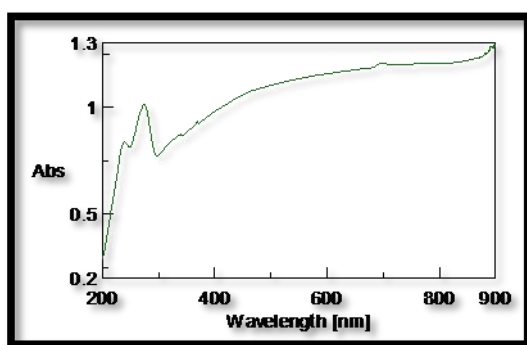


Fig 3.1.1 UV –Visible spectrum for undoped CdS

3.1.2 For V doped CdS nanoparticles

.An absorption maximum is obtained at 425 nm. The band gap energy of V doped CdS nanoparticles synthesized is 2.9176e.V

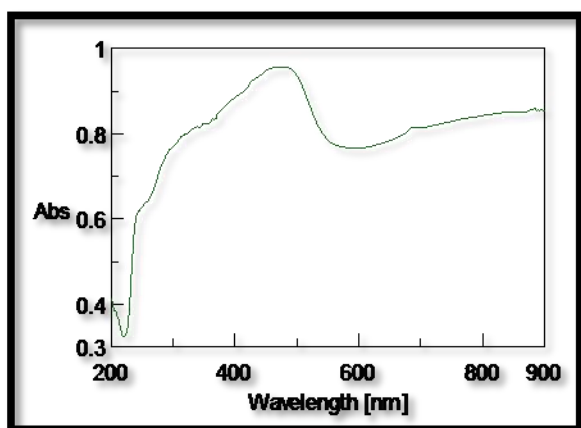


Fig 3.1.2 UV-Visible V doped CdS

3.2 FTIR Studies

3.2.1 For undoped CdS nanoparticles

The spectrum of FTIR spectrometer presented peaks at different wavelengths corresponding to the existence of various functional groups like the peak at 3664cm^{-1} was assigned to the -OH group. The absorption peak in 2924cm^{-1} is assigned with the C-H group. The deep peak or strong absorption band at 1627cm^{-1} , 1743cm^{-1} could be assigned with the stretch of C = C particles while a weak absorption band. The absorption peak reported at 1002cm^{-1} can be assigned to the presence of ester group extract with the absorbance peak 594cm^{-1} , 648cm^{-1} correspondings to the formation of CdS nanoparticles. [4,5]

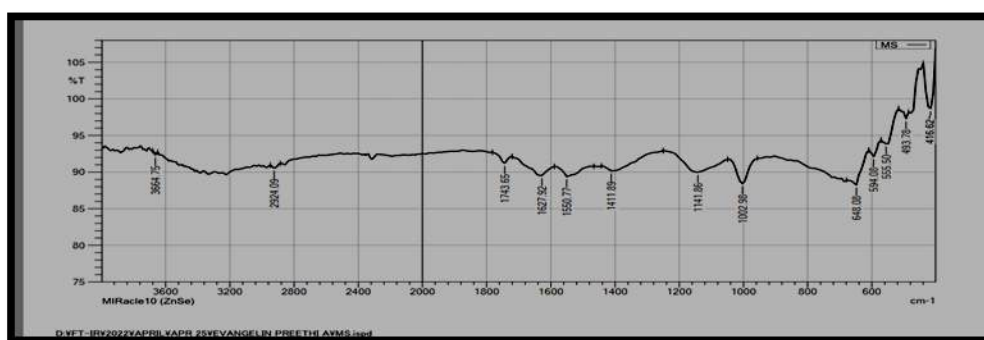


Fig 3.2.1 FTIR spectrum of undoped CdS nanoparticles

3.2.2 For V doped CdS nanoparticles

The FTIR spectrum of V ion doped CdS nanoparticles synthesized using leaf extract of *Monoon longifolium*. Small peak near 478cm^{-1} , 447cm^{-1} , 424cm^{-1} indicated the formation of CdS nanoparticles.

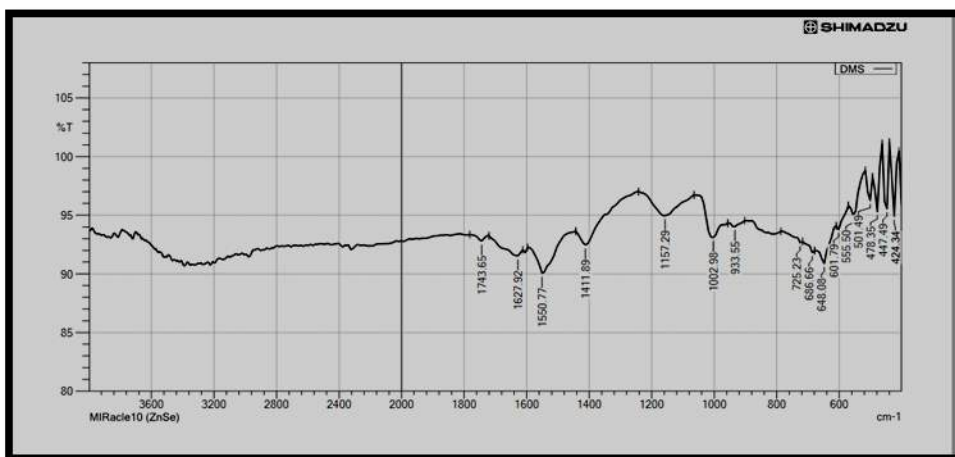


Fig 3.2.2 FTIR spectrum of V doped CdS nanoparticles

3.3 XRD

Structural parameter of CdS calculated from the XRD pattern. The prepared CdS materials were of cubic structure. The average crystallite size (D) was calculated using well known scherer’s formula $D = k\lambda / \cos\theta$. The increase in FWHM suggest that Cd is incorporated into the CdS matrix .The average crystallite size (D) of synthesized nanoparticles was found 12nm

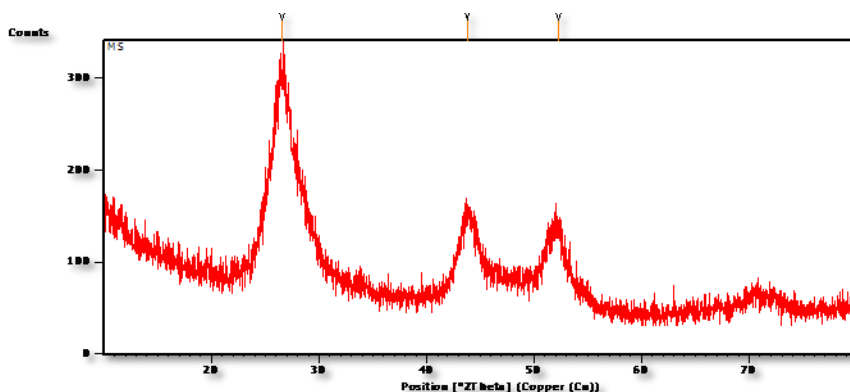


Fig3.3.1XRD Spectrum of undoped CdS nanoparticles

3.3.2 For V Doped CdS

The increase in FWHM suggest that Cd is incorporated into the V doped CdS nanoparticles .The average crystallite size (D) of synthesized nanoparticles was found to be 11.59nm.

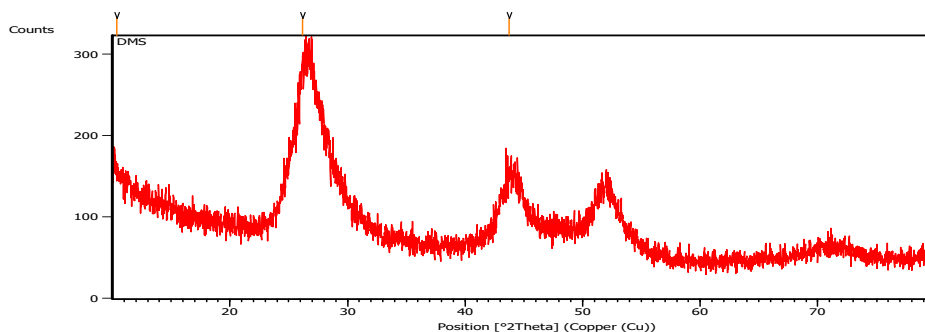


Fig3.3.XRD Spectrum of V doped CdS nanoparticles

No difference in the undoped CdS and V doped CdS figure but average crystallite size is slightly difference 0.41nm

3.4 SEM ANALYSIS

3.4.1For undoped CdS nanoparticles

The morphology and size distribution of the synthesized CdS nanoparticles can be measured by Field Emission Scanning Microscopy (FE- SEM). The average particle size ranges from 1µm-500nm. The particles are floral nature and they well separated from each other. The figure shows the different magnification as 1µm,^[3,4]

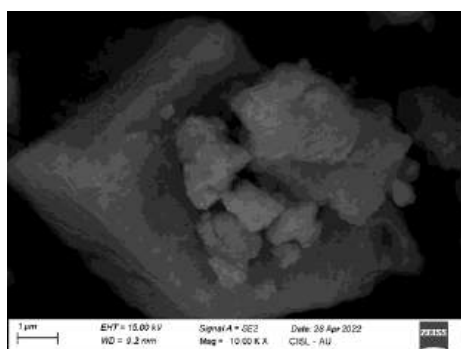


Fig 3.4.1

3.4.2 For V doped CdS nanoparticles

The morphology and size distribution of the synthesized CdS nanoparticles can be measured by Field Emission Scanning Microscopy (FE- SEM). The average particle size ranges from 1µm

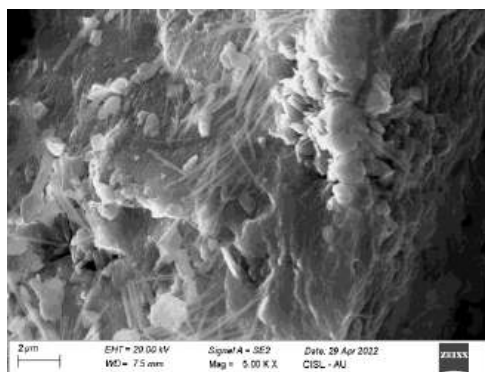


Fig 3.4.2

3.5 Energy Dispersive X-Ray Analysis (EDAX)

3.5.1 For undoped CdS nanoparticles

The elemental composition of undoped CdS nanoparticles can be obtained by Energy dispersive X-Ray analysis. The presence of cadmium and sulphide elements in the synthesized CdS nanoparticles was shown by below figure

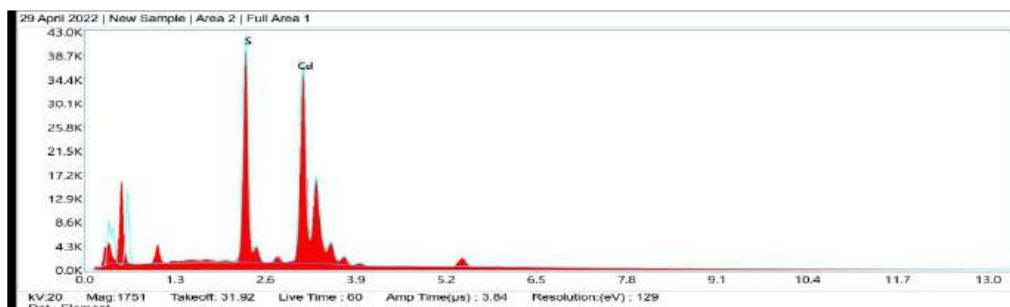


Fig3.5.1 EDAX spectrum for undoped CdS nanoparticles

3.5.2 For V Doped CdS nanoparticles

The elemental composition of V doped CdS nanoparticles can be obtained by Energy dispersive X-Ray analysis. The presence of cadmium and sulphide elements in the synthesized CdS nanoparticles was shown by below figure^[6,7]

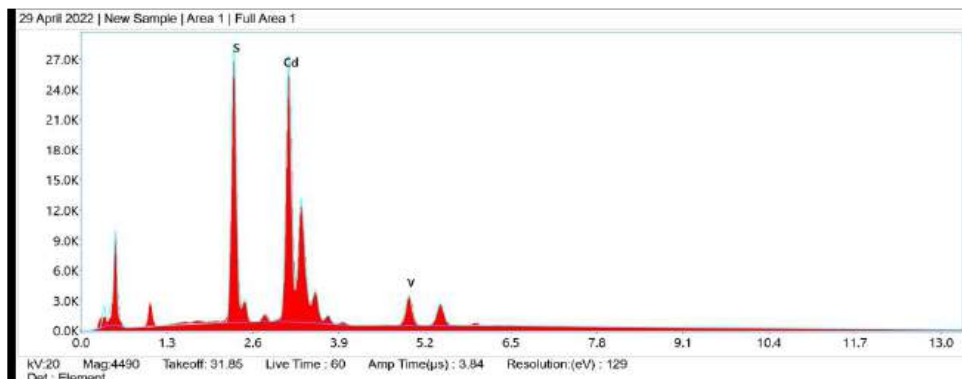


Fig3.5.2 EDAX spectrum for V doped CdS nanoparticle

3.6Antibacterial activity

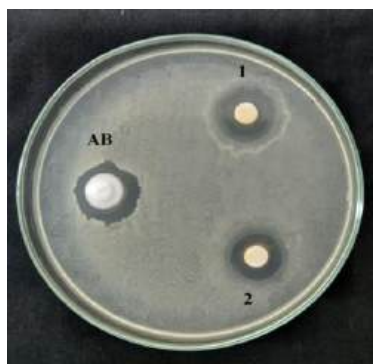


Fig3.6 (a) *E.coli*



Fig3.6(b) *Staphylococcus*

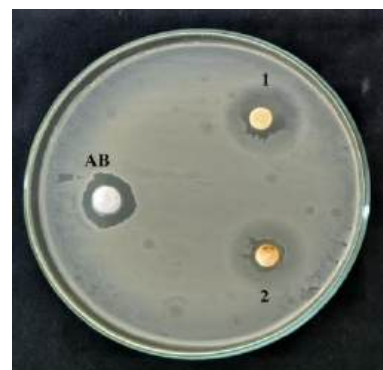


Fig 3.6 (c) *Bacillus*

subtilis

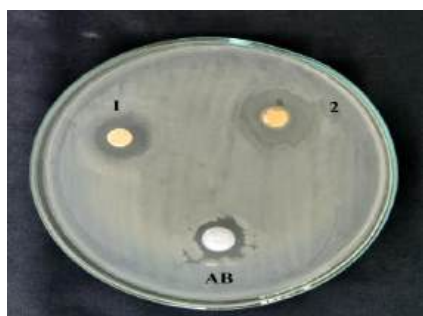


Fig 3.6 (d) *Bacillus cereus*



Fig 3.6 (e) *Pseudomonas aeruginosa*

Table.3.1 Antibacterial activity

Bacteria	Inhibition zone in mm		
	Antibiotic Ampicillin	Undoped	Doped
<i>E.coli</i>	13	12.5	10
<i>Staphylococcus aureus</i>	9	4.5	5
<i>Bacillus subtilis</i>	11.5	8	7
<i>Bacillus cereus</i>	8	9	6
<i>Pseudomonas aeruginosa</i>	11	7	8.5

The antibacterial activity of the two green synthesized CdS nanoparticles were evaluated using disc diffusion method and the antibacterial efficiency was judged based on the zone of

inhibition around the wells. In undoped CdS the inhibition was *E.coli*>*bacillus cereus*>*bacillus subtilis*>*pseudomonas aeruginosa*>*staphylococcus aureus*. In V doped CdS the inhibition was *E.coli*>*pseudomonas aeruginosa*>*bacillus subtilis*>*bacillus cereus*>*staphylococcus aureus*.

CONCLUSION:

Cadmium Sulphide nano particles are synthesized by reversed micelles method (Simple and Cost effective) using CTAB. The Cadmium Sulphide nanoparticles were characterized using several techniques such as **UV- Visible, FT-IR, XRD, EDAX and antibacterial activity.**

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FABRICATION AND CHARACTERIZATION OF MANIHOT ESCULENTA AND ELEUSINE CORACANA STARCH-BASED BIOPLASTICS PLASTICIZED WITH GLYCEROL

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Abstract

The project is based on making of bioplastic from tapioca starch and ragi starch. Due to the negative environmental impacts of synthetic plastics, the development of biodegradable plastics for both industrial and commercial applications is essential today. Researchers have developed various starch based composites for different applications. Various samples of bioplastic are produced with different compositions of tapioca starch and ragi starch, glycerol, vinegar. The best sample was analyzed for solubility testing, biodegradability properties, water absorption test, dehydration test, XRD, TGA (Thermogravimetric analysis), UV and FT-IR. The results show the suitability of tapioca starch and ragi starch based thermoplastic starch for packaging applications.

Key words: Tapioca starch, Ragi starch, Thermoplastic starch, polymer, biodegradability, TGA.

1. INTRODUCTION

Tapioca is a starch extracted from cassava roots. Tapioca accumulates food in its roots. After growing leaves and other green parts, it starts to produce carbohydrate. The ability to produce and accumulate starch depends on the variety, the age at which it is harvested, the amount of rainfall and other factors. High-amylose starch of tapioca and ragi results in superior mechanical properties. Application of tapioca starch in pharmaceutical and food industries is increased nowadays. So it is essential to test the quality of tapioca starch and segregate it based on its constituent for different applications to make the industrial final product as competitive. Identification of raw materials is a requirement of the good manufacturing practices, with the aim of ensuring product safety, raw material traceability and consistent quality. Starches can be identified by means of traditional wet chemical methods^[1].

These methods are time consuming, money consuming and they require skilled operators. This study aimed at evaluating the potential of FT-IR spectroscopy to identify starches in industry environment. Life cycle analysis studies show that some bioplastics can

be made with a lower Carbon footprint than their fossil counterparts, for example when biomass is used as raw material and also for energy production. However, other bioplastics' processes are less efficient and result in a higher carbon footprint than fossil plastics^[2-4]. As of 2018, bioplastics represented approximately 0.2% of the global polymer market (300 million tons)^[5].

1.1 Advantages and disadvantages

Many of the properties and characteristics of starch are required for the use as coating or packaging material (e.g., biodegradability, biocompatibility, edible material (nutritional value), availability, relatively simple extraction process, and low cost)^[6-12]. Other properties such as odourless, tasteless, and generally nontoxic, characterize starch as a molecule with the potential to be applied for packaging applications^[13].

Other important features of starch-based bioplastics or any other polymer are colour and transparency, related to marketing and consumer's acceptance for a given product, depending on the bioplastic's application.

1.2 Future perspectives:

In addition to all the scientific development to obtain biodegradable packaging, the environmental problem of plastic accumulation also relies on international and national government policies. For example, there are current policies for reducing the release of plastics in wastewater treatment plants, consumer education and awareness policies, besides improvements in the management of plastics life cycle.

2. MATERIALS AND METHODS

2.1 Materials

❖ Tapioca starch:

The amylose content is 17%. Good quality starch should have a pH of 4.7 - 5.3 and a moisture content of 10-13.5% and should be uniformly white in colour.

❖ Ragi powder:

Ragi starch about 5 - 8% protein, 1 - 2% ether extractives, 65 - 75% carbohydrates, 15 - 20% dietary fiber and 2.5 - 3.5% minerals.

❖ Vinegar:

By adding a small amount of vinegar, you break up some of the polymers chains, making the plastic less brittle.

❖ Glycerol:

The glycerin acts as a plasticizer which "lubricates" the plastic.

2. 2 Fabrication of bioplastic

The bio-plastic was made by mixing of tapioca starch and ragi powder. 4 g of tapioca starch was mixed with 1.2 g of ragi starch in a 100ml beaker. To this mixture 38 mL of distilled water was added. The mixture was stirred thoroughly until no lumps were present and starch was completely dissolved. 4mL of glycerol and 4ml of vinegar was added to the starch solution and mixed well. Then, the solution was heated under a low flame for 10 – 15 minutes, with constant stirring until it becomes a thick translucent paste. It was transferred from the glass beaker and spread over a flat surface of aluminium foil in warmth condition. It was dried in sunlight for one or two days. When it was completely dried, it was peeled off carefully from the surface. We called as TR-B.

3. RESULTS AND DICUSSION

3.1 Solubility test

The TR-B sample was dissolved in various solvents. The TR-B sample was completely dissolved in water but not dissolved in ethanol. The TR-B sample was partially dissolved in Toluene and Benzene. The TR-B sample was almost dissolved in Acetone^[6].

$$\text{Solubility test (\%)} = (W_1 - W_2) / W_1 \times 100$$

W_1 - Initial weight

W_2 - Final weight

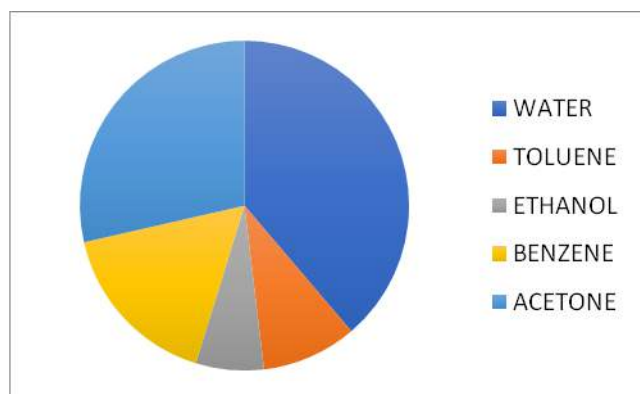


Fig. 1 Solubility percentage of TR-B

3.2 Absorption Test

Water absorption are calculated by varying the time. The absorption of water by the TR-B depends on time. The time is directly proportional to the absorption of water. The time increased as absorption also increased^[6].

$$\text{Water absorption} = (W_1 - W_2) / W_1 \times 100$$

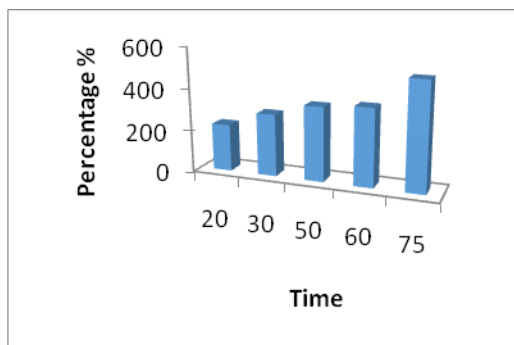


Fig. 2 Plot of Percentage of water absorption Vs time

3.3 Dehydration test

The dehydration of TR-B sample varying with time is calculated. The TR-B sample dehydrated depends on time. The dehydration of water is directly proportional to the time. When the time increased as dehydration and stiffness also increased. In a dehydrated bioplastic will be stiffer in strength, dark in colour^[7].

$$\text{Moisture content (\%)} = (W_1 - W_2) / W_1 \times 100$$

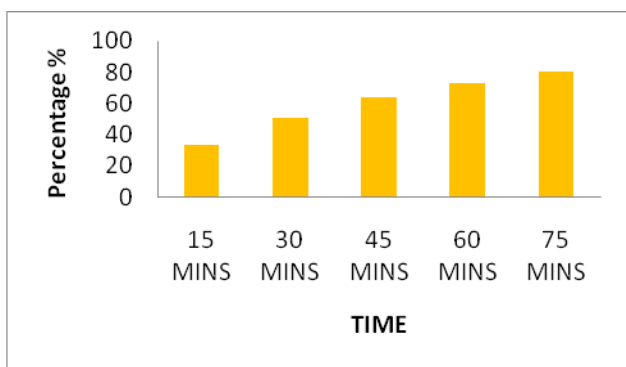


Fig. 3 Plot of Percentage of dehydration Vs time

3.4 Biodegradability test

A biodegradability test is conducted on the sample from the best results of the tensile, water absorption, and thickness. The TR-B sample was studied for biodegradability properties. The weight loss of TR-B indicated the process of biodegradation of the specimen by the micro-organisms. The no. of days increased as degradation of samples increased. The TR-B sample was degradation. About 20 days it was completely degraded and found no particles in the soil^[7].

$$\text{Biodegradability (\%)} = (W_1 - W_2) / W_1 \times 100$$

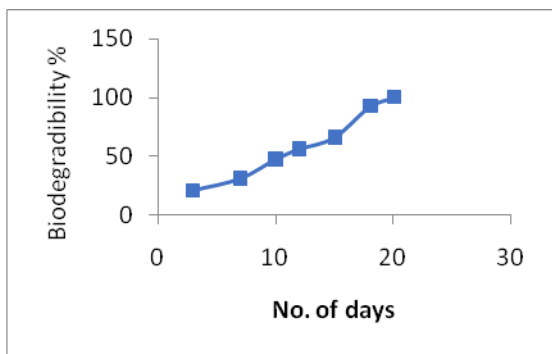


Fig 3.4 Biodegradability percentage of TR-B

3.5 XRD Analysis

The results of XRD pattern are showed in Figure 3.5. A diffraction pattern records the X-ray intensity as a function of 2-theta angle. The intensity was measured from degree of 19.69 range, because the amorphous matrix did not scatter the X-ray photons above degree of 70 and the intensities of the crystalline parts were negligibly small. The sample of TR-B is a amorphous in nature. The intensity of peak range is between 19.69 and 26.34. The TR-B sample apart the platelets resulting 5.76195 of d-spacing^[7].

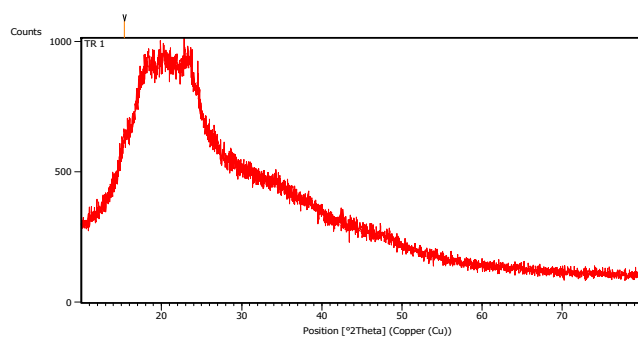


Fig. 3.5 XRD pattern of TR-B

3.6 FT-IR Spectrum

FT-IR spectrum of synthesized TR-B sample is shown in the Figure 3.6. The fundamental vibrations in 4000–2500 cm^{-1} region are generally due to O–H, C–H and N–H stretching in the TR-B sample. O–H stretching produces a broad band that occurs in the range 3700–3600 cm^{-1} for the TR-B sample. A band at around 2138-2322 cm^{-1} could possibly mean that there is C -N group in the TR-B sample. A sharp band at around 1120 cm^{-1} – 1160 cm^{-1} could possibly mean that there is a C-O-C polysaccharide or carboxylic acid group in the TR-B sample. The peak around 996 cm^{-1} is due to a stretching C-C bond. A band around 690 cm^{-1} is due to C-H stretching^[8].

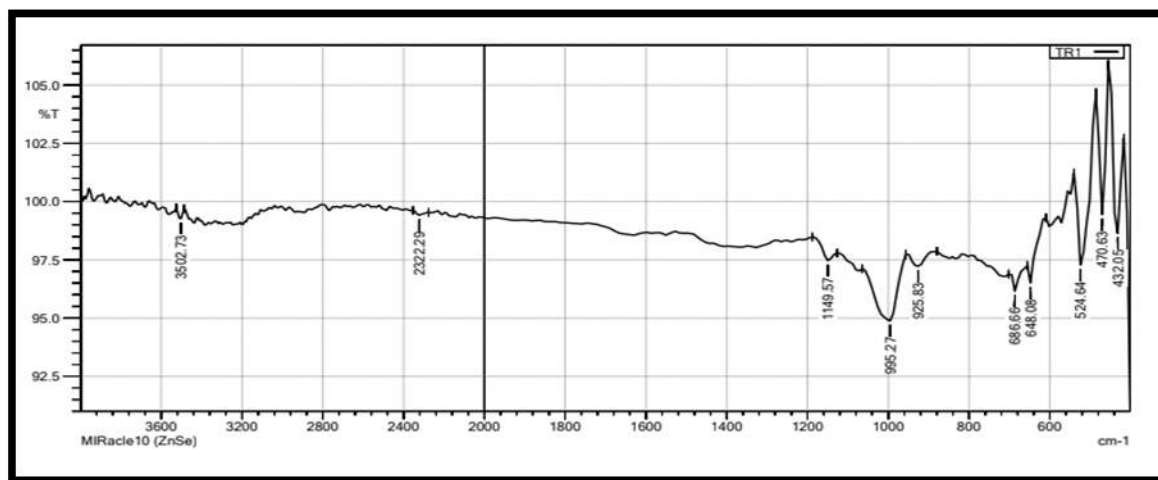


Fig. 3.6 FT-IR spectrum of TR-B

3.7 Thermogravimetric analysis (TGA)

The result of the thermal analysis is in the form of a curve called a thermogram. TG curve of bioplastic Stage 1 is the reduction weight caused by the release of moisture or water until 10.81% b/b that occurred at 50° - 130°C for 6 min. In this stage, the very light volatile matter compounds also lost and the initial stage of the thermal decomposition process occurs due to evaporation of the water. Stage 2 is the process of releasing volatile matter that occurred at 225°C - 338°C for 15 min. This stage is the main thermal decomposition stage because a high level of material lost (58.29% b/b) since tapioca starch contains amylose particles which can form carbohydrate lipids. Tapioca starch starts to decomposed thermally at the temperature of 300°C .The process of this stage triggers the rapid thermal decomposition with a large mass loss and runs rapidly due to the considerable amount of oxygen. Stage 3 is the stage after the release of volatile matter in the samples occurred at the temperature of 338°C – 463°C for 18 min. The fixed carbon content of bioplastic was relatively low 20.17% (b/b). In this stage, the charcoal is flammable as it is surrounded by volatile matter and oxygen diffused on the surface of the charcoal, which burn the charcoal and volatile matter simultaneously. This stage occurs after the release of volatile matter which leaves or forms carbon^[9].

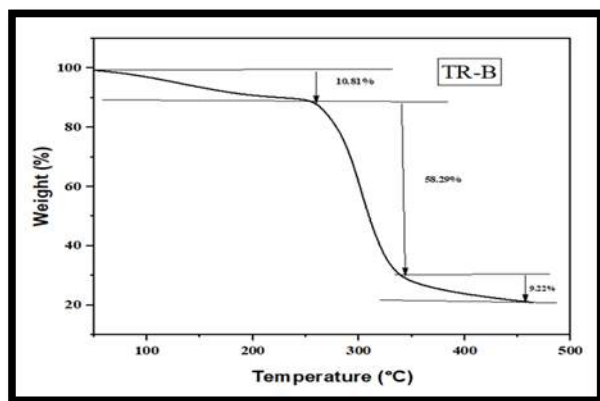


Fig. 3.7 TGA analysis of TR-B

3.8 UV analysis

The spectrum was recorded in the range 200 - 900 nm. For TR-B, the maximum absorbance is at 274 - 276 nm. This is similar to the UV absorption of starch based bioplastics^[10]. This indicates that the TR-B absorbed UV light especially UV-A region.

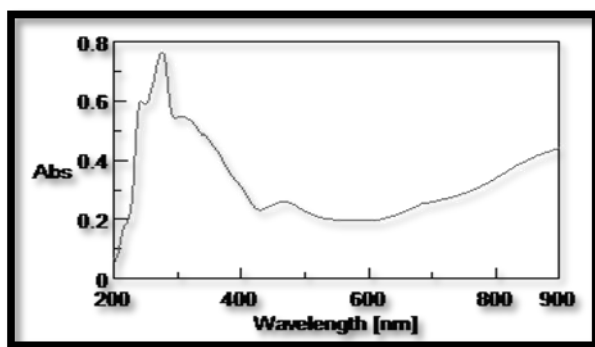


Fig. 3.8 UV spectrum of TR-B

4. CONCLUSION

The bioplastic sample was completely soluble in water and very low percentage of bioplastic was dissolved in ethanol was studied by solubility test. Water absorbed by the bioplastic sample increased with time. Dehydration test was performed by the sample TR-B. It was degraded linearly with increasing no of days and it completely degraded at a particular time. The TR-B sample was amorphous in nature was studied by using XRD analysis. In the proposed work, Functional groups of tapioca constituent and its concentration were determined for TR-B sample using FTIR spectroscopy. The weight release at the initial, second and main thermal decomposition stages are of 10.81%, 58.29% and 20.17% respectively. Stage 1 reduction of weight caused by evaporation of water content, Stage 2 is the process of releasing volatile matter and the last stage occurs after the release of volatile

matter which leaves or forms carbon was studied by TGA analysis. The UV-Vis absorption peak at 274-276 nm confirmed the bioplastic range.

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IMPACT OF IMPLEMENTATION OF GST AMONG RETAILERS IN THOOTHUKUDI TOWN

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Abstract

GST stands for “goods and services tax”, and is proposed to be a comprehensive indirect tax levy on manufacture, sale and consumption of goods as well as services at the national level. It will replace all indirect taxes levied on goods and services by the central government and state government. GST is the only indirect tax that directly affects all the sections of our economy. India has been trying to implement the goods and services tax (GST) for last few years but due to political and state governments autonomy issues the federal government has been unable to make it law.

Key words: *GST, Impact of GST, Implementation of GST, Retailers Attitude.*

INTRODUCTION

The GST is a simplified tax structure which has replaced different indirect taxes applicable on products and services in India. Previously, while there were separate laws to levy taxes, (for example, Central Excise Act, 1944, and State VAT laws), now there is a single law as GST subsumed various taxes levied. Hence, separate registrations were required but now only GST registration will be required there is a single law as GST subsumed various taxes levied. In the GST system of taxation, the tax is collected on final consumption. The representative features of the GST are:

- All indirect taxes are applicable under one tax.
- The unified tax rate is applied to all goods and services.
- A wider tax base due to large-scale application.

GST (impact)

The GST has ensured that a single CGST rate is applicable, while a uniform SGST rate is levied across all the states. GST is expected to significantly reduce the tax burden as all taxes are integrated. It splits the burden equitably between manufacturing and services. GST subsequently reduces the cost burden upon the end-consumer. Under the indirect tax system, certain taxes became a part of the costs charged. This approach is neglected under the GST, hence, minimizing the costs.

GST has also offered both the Center and the State an additional control to make law on GST. Additionally, GST is applicable at the final level of consumption, hence it brought greater transparency and a corruption-free tax administration.

Tax Laws before the Implementation of GST

- The Center and the State used to collect tax separately. Depending on the state, the tax regimes were different.
- Even though import tax was levied on one individual, the burden was levied on another individual. In the cases of direct tax, the taxpayer must pay the tax.
- Prior to the introduction of GST, direct and indirect taxes were present in India.

STATEMENT OF THE PROBLEM

The introduction of Goods and Services Tax (GST) would be a very significant step in the field of indirect tax reforms in India. By amalgamating a large number of Central and State taxes into a single tax, it would mitigate cascading or double taxation in a major way and pave the way for a common national market. From the consumer point of view, the biggest advantage would be in terms of a reduction in the overall tax burden on goods, which is currently estimated to be around 25%-30%. Introduction of GST would also make Indian products competitive in the domestic and international market.

Retail refers to the activity of reselling. A retailer is any person or organization who sells goods or services directly to consumers or end-users. Some retailers may sell to business customers, and such sales are termed non-retail activity. In some jurisdictions or regions, legal definitions of retail specify that at least 80% of sales activity must be to end-users.

Hence the present study is focused in the areas of FMCG, Textiles, Hotel, medical shop, jewelry, grossary shop, meat shop etc....And also focused on knowledge of retailers about GST, impact of implementation of GST among retailers, opinion of retailers about the GST implementation.

OBJECTIVE OF THE STUDY

- ❖ To identify the knowledge of retailers on GST.
- ❖ To understand the impact on implementation of GST by the retailer.
- ❖ To study the opinion of retailers on the GST implementation.

METHODOLOGY

PRIMARY DATA

Primary data are those data which are directly collected by the researcher or through investigator or enumerator for her purpose in first time. The primary data are original in

character. Here, primary data is collected from the retailers in Thoothukudi city by using questionnaire.

SECONDARY DATA

The secondary data are those data, which have already been collected and published or compiled for another purpose of the study. It includes not only published records and reports but also unpublished records. Secondary data require for the study have been gathered from internet, newspaper, articles, magazines etc...

SAMPLE DESIGN: The data collected are original in nature. A sample of some respondents residing in various part of Thoothukudi was selected on a random basis. The question was used for collecting a great source of information.

AREA OF THE STUDY: The sample was taken from retailer in and around Thoothukudi city. The research selected conveniently 90 respondents and the data was collected by distributing questionnaire.

REVIEW OF LITERATURE

Kang Wang (2021), on their study on, “Genomic profiling of native R loops with a DNA-RNA hybrid recognition sensor” An R loop is a unique triple-stranded structure that participates in multiple key biological processes and is relevant to human diseases. Accurate and comprehensive R loop profiling is a prerequisite for R loops studies. However, current R loop mapping methods generate large discrepancies, therefore an independent method is in urgent need.

Juan Antonio Fafián-Labora (2020), on their study on “Small extracellular vesicles have GST activity and ameliorate senescence-related tissue damage” Aging is a process of cellular and tissue dysfunction characterized by different hallmarks, including cellular senescence. However, there is proof that certain features of aging and senescence can be ameliorated.

Yudi Fernando (2018), on their study on, “Value co-creation, goods and service tax (GST) impacts on sustainable logistic performance” This paper investigates value co-creation and the impact of GST on sustainable logistic performance (SLP). Prior to data collection, metrics were verified utilizing pre-and pilot tests to ensure that measurement items were properly adapted. Then, an e-survey was conducted among Goods and Service Tax (GST) registered logistic service providers (LSPs) in Malaysia using stratified random sampling.

TOOLS FOR ANALYSIS

- ✓ Chi-Square Test
- ✓ 5 point likert’s scale
- ✓ Garret ranking method

TABLE – 1 Distribution of Socio- Economic position of the respondents

Variables	Parameter	No. of. respondents	Percentage
Age	20 – 30	12	13
	31 – 40	46	51
	41 – 50	24	27
	Above 51	8	9
Gender	Male	54	60
	Female	36	40
Educational status	Below SSLC	16	18
	SSLC	30	33
	HSC	3	9
	Graduate	12	13
	Post graduate	19	21
	Others	5	6
Business	Textiles	18	20
	Hotel	15	17
	Medical shop	14	16
	Jewelry	3	3
	Grossary shop	27	30
	Others	13	14
Nature of business	Sole trader	55	61
	Partnership	35	39

Inference

Majority 51 percent of the respondents belong to the age group of 31 – 40 years. Majority 60 percent of the respondents are male. Majority 33 percent of the respondents are educated between SSLC. Majority 30 percent of the respondents’ working area is a grocery shop. Majority 61 percent of the respondents are sole traders.

TABLE – 2 Distribution on the basis of impact on implementation of GST

Variables	Para metrics	No. of. Respondents	Percentage
Tax rate	Highly aware	40	44
	Aware	28	31
	Neutral	11	12
	Unaware	7	8
	Highly unaware	4	5
GST in favor of retailers	Yes	47	52
	No	43	48
Increment of profit level after GST implementation	Yes	52	58
	No	38	42
Satisfied with goods covered under different rate of tax	Highly satisfied	14	16
	Satisfied	23	25
	Neural	19	21
	Dissatisfied	18	20
	Highly dissatisfied	16	18
Opinion about implementation GST	Excellent	4	4
	Good	40	44
	Moderate	32	36
	Bad	6	7
	Very bad	8	9

Inference

Majority 44 percent of the respondents are highly aware of the tax rate. Majority 52 percent of the respondents are saying that GST is in favor of retailers. Majority 58 percent of the respondents say that they have increased their business profit. Majority 26 percent of the respondents are satisfied with goods covered under different rates of tax. Majority 44 percent of the respondents say that their opinion is goods.

FINDINGS

- ❖ Majority 51 percent of the respondents belong to the age group of 31 – 40 years.
- ❖ It is found that 60 percent of the respondents are male.
- ❖ According to the study, 33 percent of the respondents are educated between SSLC.
- ❖ It is observed that 30 percent of the respondents’ working area is a grocery shop.

- ❖ It is found that 61 percent of the respondents are sole traders.
- ❖ Majority 44 percent of the respondents are highly aware of the tax rate.
- ❖ It is observed that 52 percent of the respondents are saying that GST is in favor of retailers.
- ❖ According to the study, 58 percent of the respondents say that they have increased their business profit.
- ❖ Majority 26 percent of the respondents are satisfied with goods covered under different rates of tax.
- ❖ It is found that 44 percent of the respondents say that their opinion is goods.

SUGGESTIONS

- To conduct awareness classes among retailers.
- The GST process must be reduced so that business can operate efficiently in the best interest of the people and for economic growth.
- Rate should be rationalized and reduced. Daily usage items such as soaps, creams, electrical goods, film tickets should not be taxed at 28%
- Composition schemes should also be provided to small scale service providers.
- Petroleum products and electricity to be brought within the control of GST.

CONCLUSION

GST will be a very noteworthy step in the field of indirect tax reforms in India. Multiple taxes are eliminated and there is only a single tax. GST will make taxation easy for the industries. Customers will also be benefited as the overall tax burden on goods and services are reduced. GST will also make Indian products competitive in the global markets. GST will be easier to administer. Once implemented, the proposed taxation system holds great promise in terms of sustaining growth for the Indian economy.

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A STUDY ON COASTAL PEOPLE ATTITUDE TOWARDS GREEN CONSUMERISM IN THOOTHUKUDI

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Abstract

Green consumerism can be described as either a highly democratic strategy to save the planet or exploitative marketing. This study is focus on coastal people attitude towards green consumerism. Here the researches have used sampling method for distributing the questionnaire in order to study on coastal people attitude towards green consumerism in Thoothukudi. The study was carried out involving a survey on 120 sample size and chi-square analysis was used to test the hypothesis. Findings reveal that green consumerism do generate positive attitude on consumer buying behaviour.

KEYWORDS: Coastal people, Attitude, Green consumerism,

INTRODUCTION

Green consumerism is the situation in which consumers want to buy things that have been produced in a way that protects the natural environment, it is related to sustainable development or sustainable consumer behaviour. It is a form of consumption that safeguards the environment for the present and for future generations. Green consumerism can be described as either a highly democratic strategy to save the planet or exploitative marketing. As a strategy to save the planet, it confronts the mass of consumers in industrialised countries and in effect says: "it's up to you". Consumer demand has got us into the current mess, now it has to get us out again. Consumers must inform themselves about major environmental problems. By being cross-informed through product labelling, they should only select environmentally benign products -- and green lifestyles to match their new consumption tastes.

STATEMENT OF THE PROBLEM

The present situation strongly evidences those environmental problems appear to concern all civil societies, firms, and institutions globally for the past two decades. There are severe changes in the business world concerning the task towards the environment and the society. The purists look for green products. But the majority of people don't make decisions

purely on the green. Although many consumers think green is nice, when given a choice they select the brand they like or the lowest-priced product. It is the same problem when a "diet" is put on a product. The brand owners want consumers to think of diet products as healthier and with fewer calories. But people instantly think the diet product must taste disgusting. With a "green" label, consumers think that the product is overpriced, that it's not going to work, or doesn't taste good. That is a huge problem facing green products. This project is done to know about green products and their reach among the coastal people. This paper focus on A study on the costal people attitude towards green consumerism in Thoothukudi is research aims to investigate factors that might influence the people's intention to purchase organic products and also analyze the coastal peoples' attitude by looking at their awareness, perception, buying pattern and satisfaction towards the various types of organic products

OBJECTIVES OF THE STUDY

- To know how the economic downturn affects green purchases.
- To study the consumers' awareness towards green products
- To know the willingness of consumers to pay extra while purchasing green products
- To examine the relationship between factors influencing green purchase behaviour on the level of satisfaction with green products.

METHODOLOGY

Primary data were collected by questionnaire. A set of questionnaires was prepared through google forms and was sent to the public to analyse the preference of consumers toward green products. The secondary data were collected from websites, magazines, books, journals, etc. Simple Random sampling was adopted and the data were collected from 120 respondents using Google forms in Thoothukudi. The questionnaire was issued to the respondents through a google form. The study has been conducted during the period ranging from February 2022 to May 2022.

DISCUSSIONS:

- ❖ Majority of the respondents are male
- ❖ Majority of respondents are between the age of 18 to 25 years
- ❖ The majority of the respondents are student
- ❖ Majority of the respondents have a monthly income below rs 10000
- ❖ Majority of respondents are belonging to a joint family
- ❖ Majority of the respondents buy green products once in a month

- ❖ More number of respondents are influenced by product
- ❖ Majority of the respondents are saying neutral in paying excess money for the green products.
- ❖ Most of the respondents are feels that the green products are worth the money.
- ❖ Most of the respondents are agree towards the effectiveness of the green products.
- ❖ Most of the respondents are said that they are purchasing of green products for status symbol
- ❖ Most of the respondents are buy the green products while in discounts.
- ❖ Most of the respondents are sometimes repeat their purchase of green products.
- ❖ Most of the respondents are agree that green products overcome plastics
- ❖ Most of the respondents are affected by cost of living while purchasing of green products.
- ❖ Majority of the respondents are convenience to use the green products in their day-to-day life
- ❖ Majority of the respondents prefer to use the organic products
- ❖ Most of the respondents are not willing to recommend the products to others.
- ❖ Most of the respondents are believing that organic products are healthier
- ❖ Most of the respondents are satisfied with the green products
- ❖ Most of the respondents are paying extra money for getting high level of satisfaction.
- ❖ Majority of the respondent's strongly agree that the information spread through educational campaigns are good strategy
- ❖ That majority of the respondents are taken part in conserve water& energy
- ❖ Most of the respondents are believing that the green products are available in the market
- ❖ Most the people are stayed same in affecting their green purchases of economic downturn.
- ❖ Most of the people are purchasing shopping bags
- ❖ Most of the people are aware of green products through social media

CHI SQUARE TEST

The relationship between age and awareness about green products

H_0 : There is no significant relationship between age and awareness about green products.

H_1 : There is a significant relationship between age and awareness about green products.

Age \ Awareness	Very low	Low	Average	High	Very high	Total
18-25	36	10	10	4	2	62
26-35	10	2	2	5	3	22
36-45	7	4	1	2	6	20
Above 45	6	2	1	4	3	16
Total	59	18	14	15	14	120

Degree of freedom = (r-1) * (c-1)

$$= (4-1) * (5-1)$$

$$= 3 * 4$$

$$= 12$$

The above table indicates 12 degrees of freedom is 14.01. The calculated value is 66.84, which is lesser than the calculated value thus the result is dependent. **Hence it is concluded that there is no significant relationship between age and awareness about the green products.** Therefore, the null hypothesis (Ho) is rejected

SUGGESTIONS

- ✓ Marketers should play a crucial role since they have the responsibility to make the consumers understand the need and benefits of green products as compared to non-green ones. In these times, green marketing assumes even more importance and relevance in developing countries like India.
- ✓ Firms should give best vendor awards for initiation and implementation of green marketing practices
- ✓ First, marketers should review the price of green products and try to determine if they are lower or similar to other competent products. Second, consumers should be aware about green products and their importance in environment safety.
- ✓ companies should focus more to develop environmentally friendly products and put an endeavour for eco-friendly modification in product design which will increase market share and give competitive advantage

CONCLUSION

In the era of cut throat competition, it is very necessary to understand the behaviour of consumers as their needs, wants and desires are changing very frequently. Now a day's consumers are more health conscious and prefer green products. The present study attempts to examine the perception of consumers towards green products in Thoothukudi city. It is true that green products give long lasting results when compared to the chemical products. From the research it is concluded that respondents who belong to age group 18-25 years are more health conscious and prefer buying organic products believing the fact, it has neutral elements only, so that they don't have any side effects. This is the reason for the success of green products. Most of the respondents prefer to buy the organic products which exhibits reasonable price, reasonable quality and above all the supreme advantage of healthy living and lifestyle.

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A STUDY ON CONSUMERS ATTITUDE TOWARDS ONLINE SHOPPING IN THOOTHUKUDI DISTRICT

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Abstract

The content of the present research is to find out the preference of the people of Thoothukudi district on the purchasing capacity, customer choices, their behavioral patterns in respect of the main study on, “CONSUMER ATTITUDE TOWARDS ONLINE SHOPPING” the conceptual knowledge of consumer attitude towards online shopping. The study enables the readers to have a clear information about the consumer attitude towards online shopping. The data analysis is conducted with the help of the suitable statistical tools. The conclusion of the study is inferred from the findings and suggestions.

Key words: Consumers attitude, online shopping.

INTRODUCTION:

Online shopping is a form of electronic commerce which allows consumers to directly buy goods or services from a seller over the internet using a web browser. Consumers find a product of interest by visiting the website of the retailer directly or by searching among alternative vendors using a shopping search engine, which displays the same product's availability and pricing at different e-retailers. As of 2020, customers can shop online using a range of different computers and devices, including desktop computers, laptops, tablet computers, Smartphone's, and smart speakers .The emergence of online shopping as in 1940, Tim Burners Lee created the first World Wide Web server and browser in the U.K. It opened for commercial use in 1991. In 1995, Amazon launched its online shopping site and in 1996, eBay appeared. Online customers must have access to the internet and a valid method of payment to complete a transaction, such as credit card, debit card, or services like PayPal, Amazon pay, Paytm, etc.

REVIEW OF LITERATURE:

Dr D. Vijayalakshmi et.al., (2016) in their article identified that the women respondents are satisfied with quality, price and brand and package in online shopping. The

expectations of women regarding the online shopping are trustable, guarantee, delivery period, design of the WebPages, etc. Hence it is concluded that the online shopping among women are satisfied on a whole..

Madasu Bhaskara Rao, and M Mallika Rao (2018) in their analysis determine the triggers that influence consumer buying behavior in online retail formats. The explorative factor analysis concluded factors viz., easy use & convenience, security, utility, time effectiveness, departing logistics and feedback as the determinants of female consumer buying behavior online line.

STATEMENT OF PROBLEM:

An increasing number and variety of firms and organizations are exploiting and creating business opportunities on the Internet”. Above mention statistics indicate the rapid growth in the field of virtual shopping. With this emerging field of shopping the interest of marketers is also increasing in studying what actually motivates consumers to shop online. Other than the factors which influence consumers to shop online, online shopper’s demography in terms of Age, gender, income and education is equally important to define their strategies accordingly. The factors are important for retailers to compete in the market and to make their product more compatible.

OBJECTIVES OF THE STUDY:

- ❖ To study the factors inducing online shopping.
- ❖ To study the issues faced by the customers towards online shopping.
- ❖ To study the offer suggestion towards online shopping.

METHODOLOGY:

1. PRIMARY DATA:

Primary data were collected by framing a questionnaire. A structured questionnaire was prepared and were given to public through Google forms to analyses the study on consumer attitude towards online shopping. A copy of questionnaire is appended in the report.

2. SECONDARY DATA:

The secondary data is collected from the books, articles, magazines, popular websites and other sources of social media.

SAMPLING DESIGN:

The data collected was original in nature. A random sample of 85 respondents residing in various parts of Thoothukudi was selected by convenient sampling technique. The questionnaire was used for collecting a great source of information.

LIMITATION OF STUDY:

- He study was carried out only among the consumer in thoothukudi.
- The sample size was restricted 85 due to time constraints.
- The study was restricted to only the consumers of B2C online shoppers.
- The analysis is based on the responses given by the respondents and results may inherentsome biased levels which are beyond the control of the researcher.

ANALYSIS AND INTERPRETATION:

Table No-1: Factors being impressed for online shopping:

PRODUCT	NO.OF.RESPONDENTS	PERCENTAGE (%)
Price	33	39
Quality	24	28
Shopping experience	21	25
Customer services	7	8
Total	85	100

INFERENCE:

The above table proves that 39% of the respondents are impressed for price. 28% of the respondents are impressed for quality, 25% of the respondents are impressed for shopping experience, and 8% of the respondents are impressed for customer services.

Table No-2: Factors inducing Online shopping

FACTORS	NO.OF.RESPONDENTS	PERCENTAGE (%)
Easy payment	20	24
No hidden cost	11	13
Easy shopping	40	47
Wide range of product	14	17
Total	85	100

INFERENCE:

The above table proves that 47% of the respondents are motivated for easy shopping, 24% of the respondents are motivates for easy payment, 17% of the respondents are motivated for wide range of product, and 13% of the respondents are motivated for no hidden cost.

Table No-3: Problem faced by the customer:

PROBLEM DO YOU FACE	NO.OF.RESPONDENTS	PERCENTAGE (%)
Delay in delivery	15	18
Cheap quality of product	21	25
Product damage	22	26
Non delivery	8	9
Out of stock	19	22
Total	85	100

INFERENCE:

The above table proves that 26% of the respondents are affected by product damage products, 25% of the respondents are affected by product cheap quality of products, 22% of the respondents are affected by out of stock products, 18% of the respondents are affected by delay in delivery products, and 9% of the respondents are affected by non delivery products.

Table No-4: Overall Rating for the Quality of the Product purchased online.

PRODUCT OFFERS	NO.OF RESPONDENTS	PERCENTAGE (%)
Strongly Agree	9	10
Agree	47	55
Neither Agree	21	25
Disagree	4	5
Strongly Disagree	4	5
Total	85	100

INFERENCE:

The above table proves that 55% of the respondents agree that goods are available at good quality of online shopping, 25% of the respondents neither agree that

goods are available to the above statement, 10% of the respondents strongly agree that goods are available at good quality of online shopping and 5% of the respondents disagree, strongly disagree that goods are available to the above statement.

CHI-SQUARE TEST ANALYSIS:

HYPOTHESIS: H₀

There is no significant relationship between age and problem faced by the customers in online shopping.

HYPOTHESIS: H₁

There is a significant relationship between age and problem faced by the customers online

INFERENCE:

The chi square test results indicates 12 degrees of freedom at 5% level of significance is 21.02. The calculated value is 13.64. Since the calculated value is less than the table value, the null hypothesis (H₀) is accepted. Hence it is concluded that there is no significant relationship between age and problem faced by the customers in online shopping.

FINDINGS:

- ❖ Mostly (39 %) of the respondents are impressed for price in online shopping.
- ❖ Mostly (47 %) of the respondents are motivated for easy shopping.
- ❖ Mostly (26 %) of the respondents are problem face in online shopping for damage product.
- ❖ Majority (55 %) of the respondents are online shopping for quality of products that agree.

SUGGESTIONS:

- ❖ Privacy is one of the important factors determining the attitude of consumers towards online shopping, so as to improve the attitude of consumers retailers have to focus on improving the safety features for the consumers financial information on the website.
- ❖ Price is one of the important factor which results in determining the attitude of the consumer towards online shopping.
- ❖ It is found that only higher income group respondents and young respondents

strongly agree for online shopping. Online shopping for propagate awareness towards online shopping through T.V, F.M, internet, wall writings and so on.

- ❖ Website design and quality creates a positive impact on online shopping satisfaction.
- ❖ In most of the websites, the given information featuring the products on the website is quite different from the products received. This will create a lack of customer satisfaction.
- ❖ Most of the people feel that products available through online shopping are costly because of the shipping charges whereas in the traditional shopping there are no such charges.

CONCLUSION:

The determination the attitude of consumers towards online shopping of consumer durables Thoothukudi district is very important in online shopping environment. It successfully includes the entire online process of developing, marketing, selling, delivering, servicing and paying for products and services. Online shopping is a vast growing technology. If it is properly executed with assured safety and security for the transactions. The study has brought certain factors affecting consumer attitude towards online shopping Thoothukudi district. Among the socio demographic factors gender, age, mode of communication and income groups have significant impact in determining consumers attitude towards online shopping, while education, occupation and family size have no significant impact in determining consumers attitude towards online shopping.

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IMPACT OF ADVERTISEMENT ON CONFECTIONERY PRODUCTS AMONG KIDS IN THOOTHUKUDI CITY

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ABSTRACT

Advertising makes the kids aware of the new products available in the market. Confectionery is related to the food items that are rich in sugar and often referred to as a confection. Confectionery products are very much advertised so as to make kids know about it. Advertisements encourage the children to persuade their parents to purchase the products shown in the commercials, whether useful or not. This study enables the readers to have clear information about impact of advertisement on confectionery products among kids. The data analysis is conducted with the help of the suitable statistical tools. The conclusion of the study is inferred from the findings and suggestions. The introduction explains the main aim of the study.

Key words: Kids, Advertisements, Confectionery, Products,

INTRODUCTION:

Confectionery is related to the food items that are rich in sugar and often referred to as a confection. Confectionery refers to the art of creating sugar based dessert forms, or subtleties, often with pastillage. Products like chocolate, jelly, bubblegum etc., are confectionery products. Confectionery products are very much advertised so as to make kids know about it. Advertising makes the kids aware of the new products available in the market. It increases their knowledge about the latest innovations, in the field of technology as well as otherwise. On the other side advertisements encourage the children to persuade their parents to purchase the products shown in the commercials, whether useful or not. Advertisement of confectionery product like chocolates is very effective among the consumers. People get very much influenced by the Ads. Indian chocolate market is almost totally dependent on kids perception about confectionery.

REVIEW OF LITERATURE:

Halan (2012) and Singh have pointed out that advertisement constitute a major consumer market, with direct purchasing power for snacks and sweets, and indirect purchase influence while shopping.

Narasimhamurthy N. (2014) conducted a study based on television advertisement and its impact on attitudes and behavior of children. The study concluded that advertising has a strong effect on attitude and behavior on children.

PriyakaKhanna (2016) studied the perception of parents about the intended and unintended effects of television advertisements on their children. The result revealed that overall parents hold negative attitude towards television advertising, they have strong doubts about honesty of advertising to children and displayed a strong degree of cynicism about its perceived misleading aspects

STATEMENT OF THE PROBLEM:

Today, particularly young children play an important role as consumers. Especially in case of confectionery products, they do not care about the price of they pay to buy the product. They do not care whether the products are healthy for them or not. Advertisements force the children to persuade their parents to purchase the products shown in the commercials, whether useful or not. They overlook the positive side and concentrate more on the negatives. Advertisements thus have an indirect effect on the behaviour of children. Therefore, the researcher has made an attempt to study the impact of advertisement on confectionery products among the children in Thoothukudi city.

OBJECTIVES:

- To know about the awareness of confectionery products and advertisements relating to its consumption.
- To find out whether kids are getting advertising heroes as role model to imitate.
- To study the impact of advertisement of confectionery products on kids.
- To find out the influence level of television advertisement on consumption of confectionery goods.

METHODOLOGY:

The collected data were analyzed by using statistical tools namely, percentage analysis, garrett ranking and likert scale technique.

Primary data:

Primary data were collected by framing a questionnaire. A structured questionnaire was prepared and was given to public through Google forms to analyze the attitude of them towards impact of advertisement on confectionery products among kids. A copy of questionnaire is appended in the report.

Secondary data:

The secondary data were collected from journals, magazines and various websites.

Sampling design:

The data collected are original in nature. A sample of 90 respondents residing in various parts of Thoothukudi was selected on convenience basis. The questionnaire was used for collecting a great source of information.

Area of the study:

The study on impact of advertisement on confectionery products among kids has been confined to Thoothukudi city.

ANALYSIS AND INTERPRETATION

TABLE 1
Program liked by kids

Program	No of respondents	Percentage
Cartoons	56	62.2
Reality Shows	13	14.4
Movies & TV Serials	13	14.4
Others	8	8.9
Total	90	100

Source: Primary Data

INFERENCE:

It is observed that around 2/3rd majority, (62.2%) of the children like to watch Cartoons.

TABLE 1.2 Kids favourite confectionery product

Type of confectionery	No of respondents	Percentage
Sugar-candy	15	16.7
Jelly	10	11.1
Chocolate	35	38.9
Bubble gum	7	7.8
Marshmallow	9	10
Lollipop	10	11.1
Nutbar	4	4.4
Total	90	100

Source: Primary Data

INFERENCE:

It is found that the best choice of children is chocolate followed by sugar candy, jelly and lollipop.

**TABLE 1.3
Confectionery products that attracted kids**

Particulars	No of respondents	Percentage
Free Gifts	32	35.6
Price Offer	19	21.1
Colours	30	33.3
Style and Design	9	10
Total	90	100

Source: Primary Data

INFERENCE:

Around 1/3rd proportion each the kids are attracted by free gifts and attractive colours in confectionery products.

TABLE 1.4

Problems faced by kids after eating confectionery products

Particulars	No of respondents	Percentage
Stomach Pain	21	23.3
Allergy	9	10
Tooth-ache	21	23.3
Tooth-decay	10	11.1
Worm Infection	12	13.3
Not at all	17	18.9
Total	90	100

Source: Primary Data

INFERENCE:

Thus, the major problem faced by kids is stomach pain and tooth-ache after eating confectionery products.

TABLE 1.5

Opinion on ‘influence of advertisement on purchase’

Statement	Total	Mean Score	Rank
Advertisement provides necessary information	5611	62.3	I
Most of my purchases are influenced by advertisement	5365	59.6	II
Advertisement influences purchase decision	5345	59.4	III
I often buy confectionery Products because of their attractive packing	5263	58.5	IV
Advertising is truthful and ethical	5001	55.6	V

INFERENCE:

It is inferred from the ranking the majority that the respondents advertisement provides necessary information is influence of advertisement on purchase.

FINDINGS:

The major findings of the study are as follows:

- ❖ It is found that a good majority (87.8%) of the respondents check the expiry date on the confectionery products which they purchase for their kids.
- ❖ It is observed that more than half the majority says that confectionery products are not good for their kids.
- ❖ Around 1/3rd proportion of the respondents switch on the TV to pacify the kids when it cries for confectionery products
- ❖ It is found that half the majority feel that advertisement gives correct information while the other half say it does not provide the correct information.
- ❖ It is inferred from the ranking that taste has been first in the factors influencing purchase of confectionery products.

SUGGESTIONS:

The researcher presents the following suggestions based on the research study:

- ❖ Quality of confectionery products is very important since they have an impact on the health and well-being of kids. So the manufacturing units need to concentrate on making quality products.
- ❖ Parents need to monitor the time spent by their kids in watching TV shows and advertisements to avoid persuasion to buy too many confectionery products.
- ❖ Children can be easily attracted by the cartoon and jingles, Hence, as a confectionery products are concerned, children should know all the pros and cons of that particular product and be advised properly by the products regarding its consumption.
- ❖ It is the duty of parents to see what their children are watching on television and if they are highly influenced by the advertisement especially of confectionery products then parents should try to explain them what are the pros and cons of that product and how it may adversely affect their health and wellness.

- ❖ It is suggested that Government may also take care while framing rules and regulations for advertisements in various media.

CONCLUSION:

Now-a-days marketers target young children especially for confectionery products. Products like chocolates, jelly and bubble gum are very much loved by children and in this situation price is not a matter of concern. Sometimes, parents also do not care of its nutritional values and healthiness of the product. While purchasing grocery, children usually insist parents to buy those products which are advertised and loved by them. It is found that, as far as confectionery products are concerned, children sometimes insist their parents to purchase those products which were advertised in the media. Till today parents do not bother as to how and why children ask to buy products and how marketers play with the mind set of children.

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JOB SATISFACTION AMONG EMPLOYEE’S IN NILA SEA FOODS PVT. LTD., THOOTHUKUDI

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ABSTRACT

A study on employee’s job satisfaction is greatly required to improve performance of the workers for the benefit of the company. This kind of study will help the management to know the present welfare conditions, morale of the workers and help them to decide on what kind of further motivational methods to be used to make the employees efficient and satisfied. The employee’s job satisfaction has been variously defined by scholars. Usually one or more of these words are included in the definition viz., desires, wants, aims, goals, drives and incentives. This study enable the readers to have a clear information about the job satisfaction among the employees in nila sea foods pvt ltd in toothukudi. The data analysis is conducted with the help of the suitable statistical tools. The conclusion of the study is inferred from the findings and suggestions. The introduction explains the main aims of the study.

INTRODUCTION

Job satisfaction is the level of contentment a person feels regarding his or her job. This feeling is mainly based on an individual’s perception of satisfaction. Job satisfaction can be influenced by a person’s ability to complete required tasks, the level of communication in an organization, and the way management treats employees. Every individual has some needs and desires that has to be fulfilled. Any job which fulfils those needs provides satisfaction. Job satisfaction refers to an employee’s attitude towards his job. It is a combination of psychological, physiological and environmental circumstances that cause a person to feel that he is satisfied with his job. Satisfaction is the mental feeling of favorableness which an individual’s has about his job. Job satisfaction is the level of contentment a person feels regarding his or her job. This feeling is mainly based on an individual’s perception of satisfaction. Job satisfaction can be influenced by a person’s ability to complete required tasks, the level of communication in an organization, and the way management treats employees. Every individual has some needs and desires that has to be

fulfilled. Any job which fulfils those needs provides satisfaction. Job satisfaction refers to an employee's attitude towards his job. It is a combination of psychological, physiological and environmental circumstances that cause a person to feel that he is satisfied with his job. Satisfaction is the mental feeling of favorableness which an individual's has about his job.

REVIEW OF LITERATURE:

Singh & Jain (2013)¹Employee happiness and its impact on results were highlighted. The behavior of workers represents the company's morality. The satisfied staff has a significant role in customer care and sales because they communicate regularly with the customer. The office is the gateway to employee fulfillment. Good labor practices and good working conditions also improve workers' efficiency, profitability, satisfaction, and retention.

Malo (2017) concluded that an optimistic view for the employees on the organization's community, successful relationships with co-workers, supervisors' encouragement. Participants are fairly pleased with job prospects, and the wages were not satisfactory. Finally, the connection between the atmosphere of the company and satisfaction at the job is important.

STATEMENT OF THE PROBLEM:

The key to financial success and a profitable business are not only the strategies or the systems of an organization but the human resource too. In the present business world, the need for competitive workers cannot be evaded. The role of employee's job satisfaction plays an important role in reducing the employee turnover and to motivate them to work effectively. The researcher has taken up the task of analyzing job satisfaction amongst the workers of Nila Sea Foods Private Limited, Thoothukudi.

OBJECTIVES OF THE STUDY:

- To determine the employee satisfaction relating to nature of job and other related factors.
- To find out the standard of living of the employees at Nila Sea Foods Private Limited.
- To analyze the various problems faced by the labourers in the work floor

AREA OF THE STUDY:

The study was conducted at Nila Sea Foods Pvt Ltd, Thoothukudi.

METHODOLOGY:

The study is compiled with the help of both primary and secondary data. Primary data were collected through questionnaire. It was distributed among 80 employees working in Nila Sea Foods Private Limited. Secondary data were collected through the organization profile, websites, journals, magazines, etc.

ANALYSIS AND INTERPRETATION OF DATA:

TABLE 1

Employee satisfaction relating to nature of job and other related factors

Factor	Mean score	%	Rank
Salary & bonus	421	28	I
Recreational facilities	299	20	II
Safety measures	281	18	III
Provident fund & compensation benefit	260	17	IV
Leave Travel Concession (LTC)	250	17	IV
Total	1511	100	

Source: Primary Data

It is observed that ‘salary and bonus’ gets the top priority among factors that give satisfaction to employees.

TABLE 2

Standard of living of the employee’s at Nila Sea Foods Private Limited

CURRENT STATUS	NO OF RESPONDENTS	PERCENTAGE
Elite	24.3	27
Middle Class	42.48	47.2
Low Income	23.22	25.8
Total	90	100

Source: Primary data

It is found that almost half the majority of the employees belong to the middle income group.

TABLE 3

The various problems faced by the labourers in the work floor

FACTOR	TOTAL	MEAN SCORE	RANK
Work stress	5314	59	I
Over time duty	4509	50	II
Insufficient lighting & ventilation	4527	50	II
Insufficient safety	4409	49	IV
Relationship with supervisor & colleagues	3811	42	V

Source: Primary Data

It is inferred that employee work stress is the main problem experienced by all the employees.

FINDINGS

The major findings of the study are as follows :

- Around 2/3rd majority of the respondents are aged between 30 to 40 years.
- It is found that half the majority of the respondents are male while the other half consists of female respondents.
- Major proportion of the respondents are graduates.
- It is found that more than half the majority of the respondents earn a monthly income ranging between Rs.10000 to Rs.30000.
- Around half the majority of respondents have 2 to 6 years of experience .
- Major proportion of the respondents have taken up employment in Nila Sea Foods Private limited in order to have additional income to run the family.
- It is observed that a clear half majority of the respondents get their increment every year from the company.
- It is found that around half the majority of the respondents are assured of job security by the company.



- Majority of the respondents are provided with necessary training program to increase their job efficiency..
- It is found that more than two third majority of the respondents have received the bonus every year from the company.
- Around 3/4th majority of the respondents have availed loan facility provided by the company
- It is found that a major proportion of the respondents are motivated to take up the job for the good status it offers
- It is observed that a major proportion of the respondents work for 8 hours in a day at Nila Sea Foods Pvt.ltd.,
- It is found that almost half the majority of the employees belong to the middle income group.
- It is found that almost half the majority of the respondents face the problem of strict supervision at the workplace

SUGGESTIONS:

It's important to remember that job satisfaction varies from employee to employee. In the same workplace under the same conditions, the factors that help one employee feel good about their job may not apply to another employee. For this reason, it is essential to have a multidimensional approach to employee satisfaction, covering the following areas:

- The challenging nature of work, pushing employees to new heights
- A level of convenience (short commutes, access to the right digital tools, and flexible hours)
- Regular appreciation by the immediate management and the organization as a whole
- Competitive pay, which enables employees to maintain a good quality of life.
- The promise of career progression in synchronisation with employees personal growth target.

CONCLUSION

An employee's assessment of how satisfied or dissatisfied he or she is with his or her job is a complex summation of a number of discrete job elements. This job satisfaction study was a procedure by which employees report their feelings towards their job and work environment. It helped to have a powerful diagnostic instrument for assessing employee problems. Improved communication is another benefit of the study. Particularly beneficial to the company is the upward communication when employees are encouraged to comment about what they really have in their minds. This job satisfaction study revealed that



promotion policy, participation in decision making has to be improved. It helped management, both to get a better handle on why employees are lagging and to plan better solutions to problems and to assess training needs. This study proves that the employees are satisfied with the facilities provided by the Nila Sea Foods Pvt.Ltd. in Thoothukudi.

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A STUDY ON WOMEN EMPOWERMENT THROUGH SELF HELP GROUP ACTIVITIES IN THOOTHUKUDI DISTRICT

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ABSTRACT

Empowering women is the fundamental right of women. They have equal rights to participate in all spheres of activity. Improvement of society depends on women are empowered. Gender discrimination and inequality are also addressed, SHG play a vital role in sensitizing women to realise their importance and their empowerment. The group makes them to realise their potentials in promoting their financial independence. This study enables the readers to have clear information about the women empowerment through Self Help Group activities. The data analysis is conducted with the help of the suitable statistical tools. The conclusion of the study is inferred from the findings and suggestions. The introduction explains the main aim of the study.

1. INTRODUCTION

Women are a fundamental component of every economy. A country's progress and development depend on women's empowerment. Women are to be considered to be equivalent accomplices with men in progress. Empowerment of women is needed for the economic development that covers social, economic, and social well being. The country has now been turned over by the rapid growth of SHGs. The form of SHG has laid the foundation to address the above aspects of women empowerment. SHGs enhance the social, economic social status of women. The fundamental principle of SHG is group dynamics. SHG is a small group of rural economically, socially backward people especially women, to bring out their talents, skills, and their capabilities which go to enhance their empowerment. SHG structure is a seminary reinforcement of a nation. The group makes them to realise their potentials in promoting their financial independence. They normally offer permission to add a typical store and to meet on mutual aid premises and their needs. SHG participation leads to women improvement and empowerment. The process enables women to transform their potentials into action. SHG can become a vehicle of change. SHG relies on the principle of "Self Help" to encourage self-employment and poverty alleviation.

2. REVIEW OF LITERATURE

Dr. Preema Rose Jincy Jose Nichlavose (2017) In their Analysis impact of SHG initiatives on Socio-Economic status of members, in the State of Kerala, suggested that there is a need to improve the training programs that are provided to the about self enhancement and self improvement.

Kumari and Indira (2018) worked on the SHG bank linkage program in India and indicated that the numbers of self-help group are increasing every year but the performance of the SHGs on a whole was not much improving. When compared with the frequency of loans disbursed and loan standing, the average saving limit was also not increasing. The numbers of defaulters under private sector banks as compared to the other banks were found high. The study further revealed that more attention was on the disbursement of loans by the banks than the repayment of loans by the self-help group members. The possible reason of poor repayment of loans by the self-help group women might be poor knowledge of resource utilization and incompetent strategy behind the business formulation ideas.

Pradeep and Rai (2019) conducted a study on “Women empowerment through self-help groups in Bolar village of Karnataka” and concluded that the self-help group members were being respected by the family and also by society as they contributed to family income generation, consumption and savings.

3. STATEMENT OF THE PROBLEM

From time memorial women have been forced to occupy a secondary place, though they are half of the world’s population. Moreover, the societal system made women are unable to take the place as a free and independent individual. The administration of India currently offers ample scope for SHGs, especially female SHGs, Providing micro credit facilities to pave the way for small investment projects. This attempt increases the standard of life, self-reliance, freedom, independence, by of women in society. Status in all respects, trust, degree of involvement, equal opportunity and the like, women in India. It is to be clearly known, from this, SHGs play an important role in women. In this context, the researcher has attempted to investigate the impact of the Self Help Group women's empowerment, particularly with reference to Thoothukudi District.

4. OBJECTIVES

- To analyse the impact and overall development of women through self-help groups.
- To study the socio-economic conditions of women through self-help groups.
- To examine the factors that influences the women empowerment through self-help groups.
- To analyse the attitude of the members of the SHGs towards social impact.
- To examine the structure and performance of SHGs in Thoothukudi district.

5. METHODOLOGY

SOURCES OF DATA

- i. PRIMARY DATA:**
- ii. SECONDARY DATA**

PRIMARY DATA:

Primary data consisting of various question relating to the attitude of self help group. The primary data have been collected from some self help group after discussing and 95 samples are taken for the research.

SECONDARY DATA

The secondary data is collected from the books, articles, magazines, popular websites and other sources of social media.

SAMPLE DESIGN

The questionnaire collected was great source of information. By adopting convenient sampling method a sample of 95 respondents were selected from Thoothukudi district.

6. AREA OF THE STUDY:

This study conducted within Thoothukudi is known as pearl city due to pearl fishing carried out in the town, it is a beach town also one of the busiest ports has a wild wide sanctuary, numerous temples and churches and number of other monumental sites. The researcher has covered Athimarapatti, Mullakaadu, Muthaiyapuram, Thangammalpuram, and savariyapuram these five areas in Thoothukudi District.

7. DATA ANALYSIS AND INTERPRETATION

1. OCCUPATION

OCCUPATION	NO. OF RESPONDENTS	PERCENTAGE
Worker	18	19
Rural Artisan	8	8
Entrepreneur	14	15
House wife	36	38
Marginal farmer	6	6
Small farmer	4	4
Tailors	9	10
Total	95	100

SOURCE: Primary data

INFERENCE:

The above table proves that 38% of the respondents are house wives, 19% of the respondents are workers, 15% of the respondents are entrepreneurs, and 10% of the respondents are tailors. 8% of the respondents are rural artisans, 6% of the respondents are marginal farmer and 4% of the respondents are small farmers.

2. PURPOSE OF JOINING IN SELF HELP GROUP

PURPOSES	NO. OF RESPONDENTS	PERCENTAGE (%)
To save regularly	29	30
To contribute household income	35	37
To have awareness about loans	21	22
Any other purpose	10	11
Total	95	100

SOURCE: Primary data

INFERENCE

The above table proves that 37% of the respondents are joining of SHG to contribute household income through loans and advances, 30% of the respondents are joining of SHG to save regularly, 22% of the respondents are joining of SHG to have awareness about loans and 11% of the respondents are joining of self help group for any other purpose.

3. HOW LONG BEEN A PART OF SHG

DURATION	NO. OF RESPONDENTS	PERCENTAGE (%)
0 to 6 Months	26	27
6 Months to 1 year	30	32
1 year to 2 year	16	17
2 year and above	23	24
Total	95	100

SOURCE: Primary data

INFERENCE

The above table proves that 32% of the respondents are part of SHG from 6 months to 1 year, 27% of the respondents are part of SHG from 6 months to 1 year, 24% of the respondents are part of SHG from 2 year and above and 17% of the respondents are part of SHG from 1 year to 2 year.

4. PRIMARY MOTIVE OF JOINING SHG

MOTIVES	NO. OF RESPONDENTS	PERCENTAGE (%)
To develop saving habits	31	33
To get access to credit facilities	26	27
For achieving self-reliance	30	32
For socio economic empowerment and sustenance	8	8
Total	95	100

SOURCE: Primary data

INFERENCE

The above table shows that 33% of the respondents' primary motive is to develop saving habit, 32% of the respondents' primary motive is to get access to credit facilities, 27% of the respondents' primary motive is to get access to credit facilities and 8% of the respondent's primary motive is to socio economic empowerment and sustenance.

5. AMOUNT OF LOAN AVAILED

AMOUNT OF LOAN	NO. OF RESPONDENTS	PERCENTAGE (%)
Less than Rs. 3000	14	15
Rs. 3000 to 10000	64	67
More than Rs. 10000	17	18
Total	95	100

SOURCE: Primary data

INFERENCE:

The above table prove that 67% of the respondents are taking loan from Rs. 3000 to 10000, 18% of the respondents are taking loan more than Rs. 10000 and 15% of the respondents are taking loan less than Rs. 3000.

CHI-SQUARE TEST

Chi-square test was applied to find out whether there is any significant difference between the income before joining SHG and income after joining SHG in the following factor.

HYPOTHESIS: H_0

There is no significant relationship between income before joining SHG and income after joining SHG.

HYPOTHESIS: H_1

There is a significant relationship between income before joining SHG and income after joining SHG.

AFTER INCOME BEFORE INCOME	3000 – 6000	6000 - 9000	9000 - 12000	Above 12000	Total
Up to 1000	2	6	5	3	16
1000 to 2000	6	7	2	4	19
2000 to 3000	2	4	1	1	8
3000 to 4000	6	2	2	1	11
4000 to 5000	5	5	3	1	14
5000 to 6000	4	6	3	3	16
Above 6000	3	4	3	1	11
Total	28	34	19	14	95

Degree of freedom = $(r-1) \times (c-1)$

$$= (7-1) \times (4-1)$$

$$= 6 \times 3$$

$$= 18$$

The above table indicates that 18 degree of freedom is 28.86. The calculated value is 16.7 which is lesser than the table value thus the result is independent. Hence, it is concluded that there is a difference between income before joining SHG and income after joining SHG. The Alternative hypotheses H_1 or H_A is rejected.

Therefore the null hypothesis (H_0) is accepted “There is no significant relationship between income between before joining SHG and after joining SHG.

8. FINDINGS

The findings are inferred from the tables drawn, the suggestions are inferred from the annexure.

- Most of 38% of the respondents are house wives.
- Most of 37% of the respondents are joining of SHG to contribute household income through loans and advances.

- Most of 32% of the respondents are part of SHG from 6 months to 1 year.
- Most of 33% of the respondents' primary motive is to develop saving habit.
- Majority of 67% of the respondents are taking loan from Rs. 3000 to 10000.

9. SUGGESTIONS

- The SHGs entrepreneurs face the problems of marketing the product produced by them. The government may take necessary steps to market the SHGs products through public distribution system.
- Women may be given vocational training under women's entrepreneurship development programme.
- Delay in sanctioning of loan by the bank or government official should be avoided by relaxing the stringent rules and regulations. The government may insist the bank to disburse the loan immediately.
- Adequate insurance coverage should be provided to the business units promoted by SHG against the financial losses to safeguard the interest of the entrepreneurs.
- Loan amount should be increased and Information on banking and marketing aspects should be given.
- Meetings and seminars may be organised where the members will get a chance to exchange their views and be able to develop their group strength by interactions.
- Literacy and numeric training are needed for the poor women to benefit from the micro-credit schemes.

10. CONCLUSION

Empowering women puts the spot light on education and employment which are an essential element to sustainable development. A woman is said to be powerful only when she has a control over a large portion of power resources in the society. The SHG has also increased their financial independence and security. Women's empowerment is possible through the development of SHG. SHG has been identified as a source to address the financial needs of women. The study reveals that it is possible through SHG. But as of date, women were lacking behind in so many factors in realising empowerment. So attention by the government as well as other agencies should be needed to improve their empowerment. It is believed that the study might be useful to the policy makers, academicians and the government for their future course of action. In this article an attempt is made to know



women empowerment, its dimensions, concept of Self Help Groups, and their role in women empowerment followed by conclusion.

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SHOPPING THROUGH WHATSAPP AMONG COLLEGE STUDENTS, AT TUTICORIN

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ABSTRACT

The whatsapp Shopping is a web-based application intended for users. The main objective of this application is to make it interactive and its ease of use. It would make searching, viewing and selection of a product easier. The user can then view the complete specification of each product. They can also view the product reviews and also write their own reviews. The application also provides a drag and drop feature so that a user can add a product to the shopping cart by dragging the item in to the shopping cart. The main emphasis lies in providing a user-friendly search PG and Research Department of Commerce, St. Mary's College (Autonomous), Thoothukudi Affiliated to Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu, India engine for effectively showing the desired results and its drag and drop behaviour.

1.INTRODUCTION

WhatsApp is adding shopping features to its web app, making it easier for people to browse for products. Businesses too will be able to create and manage their catalog from the desktop and not just mobile phones. catalogs on WhatsApp, including, "Catalogs have also allowed businesses to easily showcase and share what they offer. Since many businesses manage their inventory from a computer, this new option will make it quick and easy to add new items or services so their customers know what's available." WhatsApp has started rolling out a new shopping button that will let users quickly look at the catalogues offered by businesses on the platform. The new button, which will replace the voice call button, will be featured directly on the chat screen to ease shopping on WhatsApp.

2.REVIEW OF LITERATURE

Barnes (2013) suggested that one of the "main reasons of convenience of WhatsApp shopping is convenience. Shopping online offers pronounced convenience. Another apparent reason why WhatsApp shopping is preferable is price comparison, avoiding long queues and 24hrs service.

Monsuwe (2004) suggested that the consumer “influence of the customer on online shopping. “Preference to buy online is also influence by consumer own personal traits, product that they are willing to purchase, previous experience with the online purchasing, and trust that they have on the online shopping.

Know and lee (2016) explored college students,” concerns about payment security and its relationship to WhatsApp shopping attitude and actual purchases”. They observed a negative relationship between attitude towards WhatsApp shopping and concerns about online payment security. It is a positive attitude seem to be less concerned about payment security. Similarly, popular literature cited ease of shopping comparison, low prices, timely delivery, convenience, time saving, low shipping costs, improved customer service, tax exempt status and speedy e-mail response, as key reasons for the increase in WhatsApp shopping

3. STATEMENT OF THE PROBLEM

There are a lot of websites on internet whereby it offers a variety of product and services for consumer can find and buy through online such as shoe, clothes, electronic gadgets, sun glasses and more However, there are several reason hinder in the consumer are involved in online shopping because some of the consumer are not willing to take part in online purchased due to the valid reason because there are worried about the quality of the product in online are not durable, moreover, there are not confident

4.OBJECTIVES

- ✓ To analyse the demographic profile of the users doing whatsapp online shopping
- ✓ To study the level of satisfaction of the consumers doing whatsapp online shopping
- ✓ To study whatsapp aims to make shopping taking place through chats convenient for users and help online business

5.METHODOLOGY

The study is complied with the help of both primary data and secondary data. Based on the discussion with the “shopping through whatsapp among college students, at Tuticorin” and keeping the objectives of the study in mind a questionnaire was prepared. By adopting random sampling method 120 college students were selected from four college in Tuticorin namely St. Mary’s (A) college, A.P.C Mahalakshmi college, V.O.C college and Kamaraj college.

6. ANALYSIS AND INTERPRETATION

6.1. GENDER WISE CLASSIFICATION

GENDER	NO OF RESPONDENTS	PERCENTAGE (%)
Male	56	47
Female	64	53
Total	120	100

Source: Primary data

47 percent of the respondents are male, 53 percent of the respondents are female

6.2. EDUCATIONAL STATUS WISE CLASSIFICATION

EDUCATIONAL STATUS	NO OF RESPONDENTS	PERCENTAGE (%)
UG	57	48
PG	46	38
M.Phil.	17	14
TOTAL	120	100

Source: Primary data

48 percent of the respondents have completed their Undergraduates degree, 38 percent of the respondents are postgraduates., 14 percent of the respondents are M.Phil., degree holder.

6.3. BEST FEATURE IN WHATSAPP SHOPPING

BEST FEATURE	NO OF RESPONDENTS	PERCENTAGE (%)
Convenience	34	28
Cheaper prices	46	38
Choices	25	21
Others	15	13
TOTAL	120	100

Source: Primary data

28 percent of the respondents felt convenience as best in whatsapp shopping, 38 percent of the respondents felt cheaper prices as best in whatsapp shopping, 21 percent of the respondents felt choices are the best in whatsapp shopping, 13 percent of the respondents like other features in whatsapp shopping.

6.4. REASONS FOR WHATSAPP SHOPPING

REASONS FOR WHATSAPP SHOPPING	NO OF RESPONDENTS	PERCENTAGE (%)
When I need home delivery	40	33
When I want something unique and special	42	34
When I need to compare prices	23	20
When I don't have the time to find things by different markets	15	13
TOTAL	120	100

Source: Primary data

33 percent of the respondents prefer home delivery, 34 percent of the respondents prefer something unique and special, 20 percent of the respondents prefer compare prices, and 13 percent of the respondents prefer the time to find things by different markets.

6.5. THE LEVEL OF SATISFICATION TOWARDS WHATSAPP SHOPPING FOR WHATSAPP PIN

PARTICULARS	AVERAGE	RANKING
I think shopping on the whatsapp saves times	4.16	I
It is a great advantage to be able to shop at any time of the day on the internet	3.73	III
Whatsapp shopping is as secure as traditional shopping selection of goods available on the whatsapp shopping is very broad	3.74	II
The info given about the products and services on the whatsapp shopping is sufficient	3.65	IV
Prefer whatsapp shopping only if online prices are lower than actual price	3.61	V

Source: Primary data

The level of satisfaction is more when time was saved and has been ranked I and the next rank was for the security it holds similar to as of traditional shopping and rank III is for any time shopping and rank IV is for information available and finally rank V was for the lowest price actually lower to the market price

6.6. RATING THE POSITIVE EXPERIENCE IN WHATSAPP SHOPPING

POSITIVE EXPERIENCE	AVERAGE	RANKING
No sales pressure	3.80	VII
convenience to buy	4.35	I
Better prices	3.93	IV
More variety	3.9	V
Easy to send gifts	3.84	VI
No crowds	4.00	III
Sometimes, return is easy	4.01	II

Source: Primary data

The positive experience that is Convenience to buy has been ranked I, sometimes, return is easy has been ranked II, no crowds has been ranked III, better prices has been ranked IV, more variety has been ranked V, easy to send gifts has been ranked VI, no sales pressure has been ranked VII

6.7.THE NEGATIVE EXPERIENCE IN WHATSAPP SHOPPING

PARTICULARS	AVERAGE	RANKING
Delay in delivery	4.05	I
Lack of touch and feel of merchandise in whatsapp shopping	2.81	VII
Lack of interactivity in whatsapp shopping	3.69	VI
Lack of shopping experience	3.73	IV
Frauds in whatsapp shopping	3.70	V
Spending too much time online	3.76	II
No support for local retailers	3.76	II

Source: Primary data

The negative experience in whatsapp shopping that is Delay in delivery has been ranked I, spending too much time online and No support for local retailers has been ranked II, Lack of shopping experience has been ranked IV, Frauds in whatsapp shopping has been ranked V, Lack of interactivity in whatsapp shopping has been ranked VI, Lack of touch and feel of merchandise in whatsapp shopping has been ranked VII,

6.8.CHI- SQUARE TEST

RELATIONSHIP BETWEEN AGE AND CONSUMERS BUYING BEHAVIOUR

❖ **HYPOTHESIS: H₀**

There is no significant relationship between age and consumers buying behaviour through whatsapp shopping.

❖ **HYPOTHESIS: H₁**

There is a significant relationship between age and consumers buying behaviour through whatsapp shopping.

AGE	OPINON LEVEL OF RESPONDENTS					TOTAL
	SA	A	N	DA	SDA	
18 to 19	4	13	33	19	10	79
19 to 20	3	3	13	3	4	26
20 to 21	0	3	5	1	3	12
Above 21	0	1	0	1	1	3
TOTAL	7	20	51	24	18	120

Source: Primary data

The above table indicates 12 degree of freedom is 21.02. The calculated value is 12.91, the degree of freedom is greater than the calculated value, and thus the result is dependent. Hence it is concluded there is no significant difference between the age and consumers buying behaviour.

7. FINDINGS

- ❖ Female respondents who are high in this study, have completed their undergraduate and consider the price as cheaper in whatsapp shopping.
- ❖ College students level of satisfaction is high because whatsapp shopping save their shopping time with lots of convenience, even though they had delayed delivery in many times.

- ❖ Most of the people prefer clothing, because there is a lot of offer and discount on sale and they have attracted by unique features of quality of a product available in the whatsapp shopping.

8.SUGGESTIONS

- ✓ Whatsapp shopping should consider the tracking issues and ensure delivery of products some are not at right time.
- ✓ It is suggested that the whatsapp shopping can also concentrate on other product categories other than clothes for the college students.
- ✓ The quality and price factors can also be focused by the whatsapp shopping group owners for the increase in sales
- ✓ They improve our network system, then only the buyers are increase purchase towards whatsapp shopping
- ✓ whatsapp shopping stores can focus on only attractive offers and discounts to target the others people but they want improve our advertisement.
- ✓ Whatsapp shopping group owners should use innovative and reachable sales promotion

9.CONCLUSION

The report title is “SHOPPING THROUGH WHATSAPP AMONG COLLEGE STUDENTS, AT TUTICORIN”. The study has been conducted with the main objective of identifying the key factors influencing whatsapp shopping purchase of students and analyzes the satisfaction level among students. From the study reveals that whatsapp shopping purchase is becoming increasingly popular for a variety of reasons. It can see that there are so many factors that influence the buying behaviour of students.

Anyone from anywhere can make their purchases peacefully without wasting much more money, time and their energy. Authenticity and user-friendly aspects can also be focused for a comfortable personal shopping experience for the college students. WhatsApp shopping plays a great “importance in the modern business environment”. WhatsApp shopping has opened the door of opportunity and advantages to the firms.

It is confirmed that the perceived marketing mix and perceived reputation could impact on the college students attitude of adopting whatsapp shopping purchase and the findings of whatsapp shopping group owners could better realize online consumer’s expectations and the determinants of college student’s behaviour. By understanding the key drivers that could



impact on online college students attitude towards whatsapp shopping purchase, it would be able to formulate and implement their e-business strategy efficiently and effectively and possess stronger competitive advantage

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A STUDY ON CUSTOMER SATISFACTION TOWARDS DOMESTIC WATER PURIFIERS IN THOOTHUKUDI CITY

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ABSTRACT

Water is the most common liquid on earth pure drinking water is necessary for human survival. Water purifier is very much connected to the history of water itself. The main objective of the study is to know the satisfaction level of consumers towards water purifier. The absolute best technology now available for treating water and removing undesirable contaminants is water purifier will remove more contaminants and provide safer, healthier drinking water.

Keywords: *Water Purifier, Chi-Square Test, TDS, Customer Satisfaction, RO.*

INTRODUCTION:

Water purification or filtering is very much connected to the history of water itself. As the population grew, water becomes highly contaminated which led to the emergence of the need for pure, clean drinking water. Although the evolution of best water purifiers took ages but people did realize the importance of it. Water is the most common liquid on earth pure drinking water is necessary for human survival. The water supply for drinking water is either ground or surface water. The water from its source contains sediments and other solids. Many different processes are used to obtain the finished product of clean water. There is lack of developed infrastructure due to poor economic situations. To accomplish these objective impurities such as sediments must be remove and bacteria must be killed along other microorganisms.

STATEMENT OF THE PROBLEM:

Purified drinking water is essential to every citizen. The government cannot provide this to the entire population of a country. In a democratic country, different procedures of different water purifier machines are entering the market with varied features. The consumer may not aware of the suitable machines depending on their acceptability. It is pertinent to know how for the consumers use the RO machines and to what extent and whether they are

contended with the available machines. Now days, the pollution is in every form and ever increasing with adulteration. In these alarming situation, it is imperative to study the impulse of using water purifier machines.

OBJECTIVES OF STUDY:

- i. To analyze the awareness about water purifier.
- ii. To study the satisfaction level of consumers towards water purifier.
- iii. To find out the factors which are affecting consumer perception regarding water purifier
- iv. To elicit the consumers' opinion on the usage of the water purifier, its price and after sales service
- v. To understand the problems faced in the usage of water purifiers and the post purchase satisfaction;

REVIEW OF LITERATURE:

Dr.S.Prakash, Deepak Toppo (2018), the study entitled “Solar Energy Based Water Purification System”. The study examined water purifier which works on solar energy. Moreover RO is a good disinfectant process. They concluded that solar energy is used for the purification of water and micro controller is also prevents the water from overflowing.

Nilma Das (2013) A Study on Factors Affecting Consumer Purchase Decision of Water Purifier, Indian Journal of Marketing, A study on the topic “A Study on Factors Affecting Consumer Purchase Decision of Water Purifier”, concludes that behavior of consumers is affected by various factors like price of product, technology, health and safety, brand name, marketing activities as well as their own characteristics.

Asian J. Exp. Biol. Sci. Volume 1 (2010) Examines that non electrical water purification system (WPS), comprised of a non woven sediment filter followed by activated carbon and disinfectant, was evaluated for chemical as well as microbial disinfection efficacy following the general guidelines of the United States Environmental Protection Agency Guide Standard and Protocol for Testing Microbiological Water Purifiers.

METHODOLOGY:

Primary data: The primary data consisting of various questions relating to the attitude of consumers. The primary data have been collected from some consumers after discussing and 100 samples are taken for the research.

Secondary data: the secondary data is collected from the books, articles, magazines, popular website and other sources of social media.

Sampling Design By adopting convenience sampling method, respondents were selected among all age groups and the Structured Questionnaire was prepared by the research team and distributed to elicit primary data.

Area of the study: A study on consumer satisfaction towards domestic water purifiers in Thoothukudi city.

TOOLS FOR ANALYSIS

- ✓ Chi-Square Test
- ✓ 5 point likert's scale
- ✓ Garret ranking method

Chi-Square Test:

A chi square(X^2) statistic is a measure of the different between the observed and expected frequencies of the outcomes of a set of events or variables.

X^2 depends on the size of the difference between actual and observed values, the degrees of freedom, and the sample size.

$$X^2 = \sum \frac{(O-E)^2}{E}$$

5 point likert's scale:

The likert's scale is a five (or seven) point scale which is used to allow the individual to express how much they agree or disagree with a particular statement. Respondents may be offered a choice of five to seven or even nine pre-coded responses with the neutral point being neither agree nor disagree.

Garret ranking method:

Garrett's ranking technique was used to rank the preference indicated by the respondents on different factors. As per this method the respondents have been asked to assign the rank for all factors and the outcomes of such ranking have been converted into score value with the help of the following formula:

$$\text{Present position} = 100 (R_{ij}-0.5) / N_j$$

Where,

Rij = Rank given for the i variable by j respondents

Nj = Number of variable ranked by j respondent

ANALYSIS AND INTERPRETATION Table – 1

Aware of the technology

Technology	No. of Respondents	Percentage (%)
Yes	61	61
No	39	39
Total	100	100

Inference:

Table 1 shows that distribution on the basis of aware of the technology. It is observed that 61 percent of the respondents are obtained aware of the technology, and the remaining 46 percent of the respondents are not aware of the technology.

Thus Majority 61 percent of the respondents are obtained aware of the technology.

Table - 2

Ranking the preferential factors of water purifier

Particulars	I	II	III	IV	V	Rank
Safe drinking water	37	20	19	15	9	I
To reduce the increased incidence of water borne diseases	17	30	24	13	16	II
TDS level of water is high in the residential area	14	11	30	21	24	IV
Increased taste of water	20	26	16	18	20	III
Better water for cooking	12	13	11	33	31	V

Inference:

The above table reveals that the majority of the respondents have given top priority to safe drinking water and is ranked as first, to reduce the increase incidence of waterborne diseases is ranked as second, increased taste of water is ranked as third, TDS level of water is high in the residential area is ranked as fourth, better water for cooking is ranked as last ranked.

Chi Square Test

Chi square test was applied to find out whether there is any significant difference between income and opinion about transport fuels in the following factors.

The X^2 test is used to understand the accuracy of the variables used and to find out whether they are independent or dependent. It is applied to validate the results of the study.

$$X^2 = \sum \frac{(O-E)^2}{E}$$

O – Observed frequency

E – Expected frequency

Expected frequency =

Row total * Column total

Grand total

HYPOTHESIS: H₀

There is no significant relationship between income and opinion about the price of water purifier.

HYPOTHESIS: H₁

There is a significant relationship between income and opinion about the price of water purifier.

Table 3
CHI SQUARE TEST

opinion Income	Very high	High	Reasonable	Low	Total
20000	12	39	22	6	79
20001 to 40000	1	7	3	0	11
40001 to 60000	4	2	1	0	6
Above 60000	0	3	1	0	4
Total	17	51	26	6	100

$$\begin{aligned}
 \text{Degree of freedom} &= (r - 1) * (c - 1) \\
 &= (4 - 1) * (4 - 1) \\
 &= 3 * 3 \\
 &= 9
 \end{aligned}$$

The above table indicates that 9 degree of freedom table value is 16.9, whereas the calculate value is 19.84 which is greater than the calculated value thus the result is independent. Hence it is concluded that there is a significant difference between the income and opinion about customer services. Therefore the null hypothesis is accepted.

Garrett's Ranking

Garrett's ranking technique was used to rank the preference indicated by the respondents on different factors. As per this method the respondents have been asked to assign the rank for all factors and the outcomes of such ranking have been converted into score value with the help of the following formula:

$$\text{Present position} = 100 (R_{ij}-0.6) / N_j$$

Where, R_{ij} = Rank given for the i variable by j respondents

N_j = Number of variables ranked by j respondent

With the help of Garrett's ranking table, the present position estimated is converted into scores. Then for each factor, the scores of each individual are added together and then total value of score and mean value of score is calculated. The factors having the highest mean value is considered to be the most important factor.

Table - 4

Problems faced after sales service

Usage	No. of Respondents	Percentage (%)
Yes	56	56
No	44	44
Total	100	100

Inference:

Table 4 shows that, 56 percent of the respondents said that problems faced after sales services and 44 percent of them do not problems faced after sales services.

Thus Majority 56 percent of the respondents agreed that problems faced after sales services.

Likert Scale:

Table - 5
Opinion on Problems faced in the Usage of Water Purifiers

PROBLEM	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
Heavy maintenance cost	31	49	16	2	2
Frequent change of filters / gram kill kit	17	54	25	3	3
High service charges	22	41	33	7	1
High power consumption	15	43	24	16	3
No proper purification after a period of time	21	39	22	9	12
Non availability of spares	24	32	30	10	6
Total	130	258	150	47	27

Inference:

Table 5 shows that exhibit the problem faced in usage of water purifier. From the table, it is inherent that majority of the respondents are faced problem of “Heavy maintenance cost” and hence 1st rank was given with the highest average score of 18 percent. Moreover, the respondents have given 2ndrank for “High service charges”, 3rd rank for “Frequent change of filters / gram kill kit ”, 4th rank “Non availability of spares”, 5th rank “No proper purification after a period of time” and they have given strongly disagree “High power consumption” with the lowest score of 16 percent.

Hence it is inferred from the ranking that majority of the respondents are faced problem of “Heavy maintenance cost ” and it was given 1st rank with the highest average score of 18 percent.

FINDINGS:

- ✚ Majority 84 % of the respondents that satisfied with the after sales service of water purifier.
- ✚ It is found that 56 % of the respondent agreed that problem faced after sales services.
- ✚ It is found that 35 percent of the respondent’s purchase aqua guard company water purifier.
- ✚ Majority 61 percent of the respondents are obtained aware of the technology.

- ✚ Majority 30 per cent of the respondents have purchased the water purifiers price ranging between Rs.5001 to 10000.

SUGGESTION:

To conclude the researcher presents the following suggestions offered for improving the services of the water purifier companies.

- ✓ Free samples and gifts should be complementary provided to every potential customer vested.
- ✓ Customer service should be given an utmost priority
- ✓ Company should conduct survey from time to time to according to which changes can be introduced in the organization to stay updated in the market.
- ✓ Changes can be introduced in the organisation to stay updated in the market.
- ✓ Alarm fixing for customers to know the level of damages and services which are need.
- ✓ Sales person at the retails counters should have proper knowledge about the product
- ✓ When the price of the product is getting cheaper, then more customer will prefer water purifier.

CONCLUSION

Water treatment is often necessary if surface water supplies and sometimes ground water supplies are to be available for human use. Because the vast majority of the cities use one water distribution system for household industries and hospitals etc., large quantities of water often must be made available to satisfy the highest water purifier usage. The threat of harmful contaminants in drinking water can no longer be reasonably ignored. There are many home treatment alternatives that can purify drinking water to a greater extent than city treatment plants. Reverse osmosis and distillation, two of these alternatives are moderately successful at removing some contaminants but they are expensive and wasteful. The absolute best technology now available for treating water and removing undesirable contaminants is water purifiers when compared to any other water treatment alternative will remove more contaminants and provide safer, healthier drinking water.

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A STUDY ON CONSUMER PREFERENCE TOWARDS FOUR WHEELER IN THOOTHUKUDI

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ABSTRACT

The concept of “Consumer Preference” is of prime importance in marketing and has evolved over the years. It is very important to understand consumer Preference as it plays a vital role while purchasing products. Day to day human wants is growing, expectation is growing. Car Models are no exception to this preference. Consumer preference is fairly complex as Car Purchase implies a high level of social and psychological involvement. Consumer preference is a blend of Economic, technological, political, cultural, demographic and natural factors as well as Customer's own characteristics which is reflected by his attitude, motivation, perception, personality, knowledge and lifestyle. This study enables the readers to have a clear information about the consumer preferences towards four wheeler. The data analysis is conducted with the help of the suitable statistical tools. The conclusion of the study is inferred from the findings and suggestions. The introduction explains the main aim of the study.

1. INTRODUCTION

India being the second most populated country in the world and the growth rate of Indian economy is also high as compared to developed countries, which attracts the presence of huge demand in the Automobile Small Car Industry. The concept of “Consumer Preference” is of prime importance in marketing and has evolved over the years. It is very important to understand consumer Preference as it plays a vital role while purchasing products. Day to day human wants is growing, expectation is growing. They can identify their own strengths and weaknesses, where they stand in comparison to their competitors, chart out the future progress path and improvement. The consumer car market changed very rapidly due to the fierce competition and advance technology; therefore, it requires the automotive manufactures to understand the consumer's preference on time and take fast actions to reflect market changes quickly. So, it would be very interesting to know consumer's preference in today's fast-changing passenger car market and how is the customer's buying process.

2. REVIEW OF LITERATURE

Tausif, M. R., & Haque, M. I. (2019) explored in this study those consumer preferences regarding the automobile sector on the basis of six dimensions: fuel efficiency, resale value, maintenance cost, pollution (environment-friendly), product image, country of make. He recognized that high mileage and low maintenance cost are the two factors preferred by consumers in his study.

N. Selvaraj, & et.al (2019) explained that male and female customers preferences were the same like the car fitted with the latest technologically, newly developed accessories and systems, power steering, and good pick up, Fully Automatic, drivability in traffic is good, technological advancement in the car, the broad wheelbase, ABS brake system, eco-friendly with less emission of CO₂ considered by them to buy a new car with new latest technology.

3. STATEMENT OF THE PROBLEM

Due to the emergence of globalization and liberalization there is a stiff completion among the four-wheeler industries which are focusing attention in capturing the Indian markets an automobile is no more considered as luxury once, now occupies a part of day-to-day life and has become a necessity. Customers have now changed their attitude that yesterday's luxuries are today's necessities. To be a successful marketer it is absolutely essential to study the perceptions of the prospective buyers and track their drivers of those preferences.

4. OBJECTIVES OF THE STUDY

- To study the buying motivates & behaviour of four-wheeler.
- To analyse consumer preference towards to buy four-wheeler.
- To study the brand preference towards to buy four-wheeler.
- To identify the problem faced, while purchasing four-wheeler.

5. AREA OF THE STUDY

This study was conducted within Thoothukudi city.

6. METHODOLOGY

PRIMARY DATA: The primary data consisting of various questions relating to the attitude of consumers. The primary data have been collected from some consumers after discussing and 85 samples are taken for the research.

SECONDARY DATA: The secondary data is collected from the books, articles, magazines, popular websites and other sources of social media.

SAMPLEDESIGN: The questionnaire collected was great source of information. By adopting convenient sampling method, a sample of 85 respondents was selected from Thoothukudi.

7. ANALYSIS AND INTERPRETATION

1. The buying motivates & behaviour of four-wheeler

Particulars	No of Respondents	Percentage (%)
Through social media	25	29
Through friend	27	32
Through advertisement	13	15
Others	20	24
Total	85	100

INFERENCE:

The above table shows indicates that 32 percent of the respondents influence to purchase through friend, 29 percent of them social media, 15 percent of them advertisement 24 percent of them influence to purchase through others.

Thus majority 32 percent of the respondents influence to purchase through friend.

2. Consumer preference towards to buy four-wheeler

Reasons	No of respondents	Percentage (%)
Necessity	50	59
Luxury	11	13
Status	16	19
Symbol	6	7
Prestige	0	0
Comfortable	2	2
Total	85	100

INFERENCE:

The above table shows that 59 percent of the respondents have purchased a four wheeler due to necessity, 19 percent of them status, 13 percent of them luxury and the remaining 2 percent of them are comfortable.

Thus, majority 59 percent of the respondents due to a necessity

3. The brand preference towards to buy four-wheeler

Preference	No of respondents	Percentage (%)
Tata	16	19
Toyota	1	21
Maruti Suzuki	20	23
Renault	7	8
Honda	9	11
Others	15	18
Total	85	100

INFERENCE:

brand, 21 percent of them Toyota, 19 percent have Tata, 18 percent of them have other brand, 11 percent have Honda and the remaining 8 percent of them Renault.

Thus majority 23 percent of them have preferred Maruti Suzuki brand

4. The problem faced, while purchasing four-wheeler

Problems	Noof Respondents	Percentage (%)	Rank
Poor mileage	36	42	I
Starting problem	12	14	III
Less pick up	11	13	IV
Spare parts are not available	10	12	V
Other problem	16	19	II
Total	85	100	

INFERENCE:

The above ranking table exhibits the nature of problems of four-wheeler. It is seen that the majority of the respondent said that poor mileage ranked as first followed by others problems, starting problem, less pick up and spare parts are not available ranked as II, III ,IV and V respectively.

8. FINDINGS

- ❖ Majority 32 percent of the respondents influence to purchase through friend.
- ❖ Majority 59 percent of the respondents due to a necessity
- ❖ Majority 23 percent of them have preferred Maruti Suzuki brand.
- ❖ The above ranking table exhibits the nature of problems of four-wheeler. It is seen that the majority of the respondent said that poor mileage ranked as first followed by others problems, starting problem, less pick up and spare parts are not available ranked as II, III ,IV and V respectively.

9. SUGGESTIONS

- ❖ Fuel price, car manufactures should give great importance in producing cars with more mileage.
- ❖ The cars should be produce in different sizes and with various seating capacities so that it will enable consumer to choose as per the need and expectation.
- ❖ Since all aged group of consumer are well aware about the brands, companies should concentrate on their brand value in the market.
- ❖ Indian consumers are price sensitive. So, companies should be aware of the pricing and strategies.

10. CONCLUSION

According to this study, most of the respondents are well aware of the four wheeler sector. In automobile industry brand is an important element. Companies always try to keep their brand strong in the market. Another impact element is price, since Indian consumers are price sensitive. Companies will look forward to their pricing strategies. Indian consumer are price consider family needs. In Indian consumer gives priority to the family members.They purchase a product if it satisfied the needs of the others members in a family. So, car manufactures should concentrate on the basic needs of a consumer. Benefits and offers are



key to attract the consumer. So, most of the companies are giving offers in order to attract the consumers. Indian market is fastest growing market in Asian continent. So, companies and manufacturer should aware about the need and requirements of the consumers also requires a continuous evaluation of a market in order to find out the change in customer tastes and preferences.

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A STUDY ON CONSUMER'S PERCEPTION TOWARDS CONSUMING ORGANIC PRODUCTS AFTER COVID-19 IN THOOTHUKUDI

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ABSTRACT

"Organic" or "organically grown" foods are commonly represented as "food grown without pesticides; grown without artificial fertilizers; grown in soil whose humus content is increased by the additions of organic matter; grown in soil whose mineral content is increased with applications of natural mineral fertilizers; has not been treated with preservatives, hormones, antibiotics etc." The substitution of "organic" for "chemical" fertilizers during the growth of plants produces no change in the nutritional or chemical properties of foods. All foods are made of "chemicals." Convenience sampling method was adopted for this survey. The questionnaire was circulated and the data were collected from the consumers who use organic products (85 respondents). The survey highlighted that most the users of the organic products are highly satisfied.

KEYWORDS: Organic, Organic Product, Organic agricultural Production, Consumer behaviour.

INTRODUCTION:

People are increasingly becoming aware of the safety issues and environmental issues because of their increased concern about health, the environment's health, and its global implication. Organic Products now have become a viable alternative for an increasing number of consumers, who are worried about the presence of chemical residue and the negative consequences on the environment caused by intensive production methods. Many farmers also now see organic farming as a way to stabilize or even increase their income due to public policy support and growing market demand.

MATERIALS AND METHODS

(REVIEW OF LITERATURE)

Farah Ayni Shafie (2012), Social & behavioral Science, Consumers also associate Organic food with natural process, care for the environment and non use of pesticides and

fertilizers. Its premium price continues to suppress organic food consumption. Understanding the grounds of increasing level of consumption of organic food such as motivation are most critical in understand the potential of the Organic food to become a genuinely mainstream market.

Elzaker, (2014) indicated that one of the most important points to take into account while comparing organic and conventional cotton production costs. In organic cotton is produced in an organic farm system which produces many other crops in rotation. The main difference between both the systems is the costs of maintaining or improving soil fertility.

Lea. (2016), in their study of Greek consumers pointed out that consumers are well informed about environmental and health issues. Consumer's attitudes, in particular towards the health attributes and towards the environment, are the most important factors that explain consumer decision making processes for organic products. This awareness has also lead to the decrease in preference of the consumers towards conventional products.

Benjamin wood (2017), Journal of Globalization and Health, The public health community has become increasingly critical of the role that playing the unhealthy diets. It reduces intense competition with maintaining dominance over smaller rivals, and increase buyer power over suppliers.

STATEMENT OF PROBLEM

With rising disposable income levels, the consumers are willing to spend money on personal needs, and indulgences for 'Organic Product' perception become the norm of expression after COVID-19. The higher consumer is not stressing about low price levels but higher value-seeking versus price-sensitive consumers. So, the study helps to find out the Organic Product to the brand loyalty, and the need, preference pattern of the respondents towards health. Thus, the research is interested to know the loyalty to Organic products, especially after COVID-19.

OBJECTIVES:

- ❖ To know the organic products preferred by the customers
- ❖ To know about the awareness level of consumers regarding organic products
- ❖ To itemize the factors which include customer to purchase organic products
- ❖ To assess the preferred place for buying the organic products

RESEARCH METHODOLOGY

Sampling design	Convenient sampling method
Period of the study	February 2022 to May 2022
Data used	Primary and Secondary data
Test for analysis	Percentage Analysis, Chi- Square Test, Likert Five Point Scale Technique

LIMITATIONS OF THE STUDY:

- The researcher focused on consumer behaviour towards Organic Products in Thoothukudi only and attempted to limit the research results that have emerged most recently.
- Due to the limited number of respondents with an unequal gender balance from the surge, the findings from the sample cannot be generalized to the entire population of Organic consumers of Thoothukudi. A larger sample is needed for a more conclusive study.
- This study aimed to study behaviour and attitude. The study of behaviour was only very basically observed due to the limitation of time and resources available.
- Reliability and accuracy of the analysis depend on the respondent’s openness and trueness towards each question in the questionnaire.

RESULTS AND DISCUSSION: B

TABLE 1. RANKING OF PRODUCTS PREFERRED BY THE RESPONDENTS

**RESPONSE TABLE
RANK TABLE**

Product	Total	Mean score	Rank
Food	5045	70	I
Clothing	3846	50	II
Skincare	2544	31	III

Source: Primary data

Inference:

From the above table, it is inferred that most of the respondents prefer organic food and it is ranked first, with a mean score of 70, followed by a preference for organic clothing with a mean score of 50 which takes the second position, while organic skincare products get the third rank with a mean score of 31.

TABLE 2. OPINION LEVEL OF PUBLIC TOWARDS ORGANIC PRODUCTS

Particulars	HS	S	DS	N	Total	Average	Rank
Level of satisfaction	61	10	6	8	294	3.45	I
Health consciousness	30	36	11	8	258	3.03	III
Quality product	45	16	13	11	265	3.11	II
Advertisement	9	50	17	9	229	2.69	IV

Source: Primary data

Inference:

It is inferred that level of satisfaction ranks first with the highest score of 3.45, quality product rank two, health consciousness ranks three and advertisement ranks four with the least score of 2.69.

TABLE 3. FACTORS FOR BUYING ORGANIC PRODUCTS

Particulars	No. of respondents	% of respondents
Healthy	22	32%
Accessibility to purchase	27	26%
Variety of offer	29	34%
Fair outcome	7	8%
Total	85	100

Source: Primary data

Inference:

The table shows that 32 per cent of the respondents buy the product to remain healthy, 26percent of the respondents buy because of accessibility to purchase, 34percent of the respondents buy because of offers, and 8 percent of the respondents buy because of fair outcomes.

TABLE 4. SHOWING THE LOCALITY OF CONSUMERS AND PREFERRED PLACE OF BUYING

HYPOTHESIS: HO

There is no significant relationship between locality of the consumers and preferred place for buying organic products.

HYPOTHESIS: H1

Place Locality	Wholesale	Retail store	Hyper	Specified showroom	Total
Urban	6	9	10	10	35
Semi-urban	10	4	9	3	26
Rural	8	3	13	-	24
Total	24	16	32	13	85

There is a significant relationship between locality of the consumers and preferred place for buying organic products.

Rows/Columns	O	E	(O-E)	(O-E)²	(O-E)²/E
R1C1	6	9.8	3.8	14.4	0.14
R2C1	10	7.3	2.7	7.29	0.99
R3C1	8	6.7	1.2	1.44	0.21
R1C2	9	6.5	2.5	6.25	0.94

R2C2	4	4.8	0.8	0.64	0.13
R3C2	3	4.5	1.5	2.25	0.49
R1C3	10	13.1	3.1	9.61	0.73
R2C3	9	9.7	0.7	0.49	0.05
R3C3	3	9.0	6	36	4
R1C4	10	5.3	4.7	22.09	4.16
R2C4	3	3.9	0.9	0.81	0.20
R3C4	0	0	0	0	0
Total	75				12.04

Degree of freedom = (r-1) * (c-1)

$$= (3-1) * (4-1)$$

$$= 2 * 3$$

$$= 6$$

The above table indicates that 6 degrees of freedom is 12.05 the calculated value is 12.04, which is greater than the calculated value thus the result is independent. Hence it is concluded that

There is a significant relationship between locality of the consumers and preferred place for buying organic products. Therefore the null hypothesis (Ho) is accepted.

FINDINGS:

- ❖ The majority of the respondents are selecting organic products for the quality of the products.
- ❖ Most of the respondents are aware of organic products.
- ❖ Around 70 per cent of the respondents prefer organic food.
- ❖ The majority of the respondents are satisfied with organic products. It shows that people are consuming organic products are highly satisfied.

SUGGESTIONS:

- ✓ Organic Products are to be certified properly before being sent out for delivery so as to gain acceptance by the customer – base.

- ✓ Price of the Organic Products can be kept low. This can facilitate its reach in both urban & rural...
- ✓ Awareness can be made among the people so that is assumed that users of Organic Products can reduce various health issues.
- ✓ Organic Products should be made available even in rural areas, so as to increase the level of satisfaction by increasing the frequency of purchasing the products.

CONCLUSION:

It is true that organic products give long-lasting results when compared to chemical products. From the research, it is concluded that respondents who belong to the age group of 21-30 years are more health-conscious and prefer buying organic products believing the fact, that it has natural elements only so that they don't have any side effects. This is the main reason for the success of organic products. Most of the respondents prefer to buy organic products which exhibit reasonable prices, reasonable quality, and above all the supreme advantage of healthy living and lifestyle.

Organic products must be certified properly before it is out for delivery. The market for organic products must be at a proper location where the consumer can easily access them. It is found that people prefer a shift from inorganic products to the organic product due to health consciousness. Awareness can also be given about organic products for better credibility.

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A STUDY ON CUSTOMERS' SATISFACTION AND PERCEPTION TOWARDS JEWELLERY PURCHASE IN THOOTHUKUDI

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ABSTRACT

Consumer satisfaction helps marketers to analyse and forecast consumer behaviour in the marketplace. Consumer behaviour is defined as the behaviour that consumer display in searching for, purchasing, using, evaluating and disposing of products, services and ideas that they expect will satisfy their needs. A consumer's decision to buy a jewel is influenced by number of factors as purity, cost, pattern, advertisement, store ambience, promotional offers and loyalty. Consumers differ from one another in terms of their sex, age, income level, educational background or occupation and personal characteristics which influence their buying behaviour. The needs of elderly consumers are different from those of young consumers. To successfully market to consumers with different personal characteristics, the marketer must accordingly modify his marketing strategies.

KEY WORDS: Consumer Satisfaction, Jewellery

INTRODUCTION

Jewellery is a type of accessory that includes necklaces, rings, bracelets, watches, and earrings, and the like. Jewellery is being designed for men, women, and children and can be made from a variety of different categories. In India, jewellery has not only traditional and aesthetic value, but is also considered as a source of security in times of financial crisis. The current era of consumer purchasing decisions differs significantly from previous eras, particularly prior to India's liberalisation. Individual income, lifestyle, and literacy rates have all altered dramatically in the last two decades, necessitating a new method to evaluation and purchasing decision. The influence is also perceived as a result of the different brands available on the market, each of which entices consumers in their own unique way. The Indian market is brimming with a wide range of designs and products. Because Indians are very traditional, brand management is critical in today's marketplaces, particularly in India. Customers are demanding more value for their money as gold prices rise. For small-town

residents, gold was simply a safe investment. During the wedding season, they used to acquire a lot of heavy jewellery. However, people are now on the lookout for real, stylish, and designer jewellery. This is reflected in their product offers, collections, and marketing efforts. The Indian jewellery industry is transitioning from traditional to branded formats. Consumers are more concerned about quality than they have ever been. The jewellery industry is one of the country's top user industries, followed by telecommunications and probably the food industry.

STATEMENT OF THE PROBLEM

Gold jewellery is the most popular among South Indian women. They are skilled gems in the lives of ladies in India at various stages of life, for example, during childbirth, transitioning, marriage, becoming a mother, and so on. The Indian market was witnessing a rapid shift from viewing jewels as a business to viewing them as stylishly appealing decorations. The more youthful generation was looking for trendy, contemporary jewels while staying away from substantial, traditional gold gems. The Indian buyer was eager to experiment with new outlines. Some organisations have even cleverly capitalised on Indian traditions and customs to publicise and establish their brands. As a result, it is necessary to consider the various behaviours of persons and to receive advancements in accordance with the most up-to-date requirements of these folks.

REVIEW OF LITERATURE

1. Kearney, (2013) stated that Gold is a symbol of prosperity and appeals to both younger and older generations across social strata within the country. The fashion-wear segment that currently has 8 to 10 per cent share but has gained importance with the increase in demand for Gold jewellery. The growth in this segment is being driven by rising income levels and the adoption and promotion of western concepts such as solitaire engagement rings. Who is influencing the buying decision? It can be for family, friends, and needs. This survey explored that none of the women were influenced by their female friends hence they infer that woman play minor role, when it comes to influencing her friend in buying of Jewellery.
2. Ramachandran, K. K. & Karthick, K. K. (2014) in their paper, “A study on the perception of customers towards branded jewelry” found that branded jewellery products have formed a sort of revolution in the field of jewellery market. The main

attraction of branded jewellery is that it has a unique style of their own that differentiates them from unbranded jewellery.

3. Gomathy, C. & Devi, Y. (2015) in their paper, “A study on consumers’ awareness and perception about branded jewellery” examined that maximum number of customers are aware of branded jewellery. Tanishq brand is the most preferred brand by the customers.
4. Mulky, A. G. et al. (2015) in their study, “Market entry strategy in platinum jewellery category explored the 4’s p of marketing” found that the jewellery market in India is booming, with many players placed at different points on the spectrum of price, quality, innovation and design.
5. Rawal, K. R. (2015) in their research, “A study of consumer buying behaviour for purchasing of diamond jewellery from branded retailers” determined the factors influencing consumer buying behaviour to select branded jewellery product from branded outlets. This study helped to get an idea about the customer’s expectation, perception and attitudes of consumer towards branded jewellery.

OBJECTIVES

- ✓ To analyze the factors affecting the purchase decision regarding the selection of jewellery shop.
- ✓ To know how brand preference is formed in purchasing Gold ornaments among consumers.
- ✓ To analyze the problems faced by the consumers while purchasing jewels.

METHODOLOGY

The study is compiled with the help of both primary and secondary data. Based on the discussion with the respondents and keeping the objectives of the study in mind, a questionnaire was prepared. This was administered to a sample of 56 respondents. Secondary data were collected through books, journals, websites and Magazines.

ANALYSIS AND INTERPRETATION OF DATA

Table 1.1

Factors affecting selection of Jewellery shop

S.NO	Source	Extremely Satisfied	Very Satisfied	Moderately Satisfied	Dissatisfied	Extremely Dissatisfied	Total Score	Avg Score	Rank
1.	Brand Name	21	28	6	1	0	237	4.23	III
		(105)	(112)	(18)	(2)	(0)			
2.	Quality	29	17	9	1	0	242	4.32	II
		(145)	(68)	(27)	(2)	(0)			
3.	Price Fluctuations	19	25	11	0	1	229	4.08	IV
		(95)	(100)	(33)	(0)	(1)			
4.	More designs and collections	30	25	1	0	0	253	4.51	I
		(150)	(100)	(3)	(0)	(0)			
5.	Influence of Peer	8	26	19	2	1	206	3.67	VII
		(40)	(104)	(57)	(4)	(1)			
6.	Advertisement	8	25	15	4	4	197	3.51	IX
		(40)	(100)	(45)	(8)	(4)			
7.	Traditional Purchase	13	24	10	9	0	209	3.73	VI
		(65)	(96)	(30)	(18)	(0)			
8.	Reliability	16	21	12	6	1	213	3.80	V
		(80)	(84)	(36)	(12)	(1)			
9.	Luckiness of Shop	15	15	13	13	0	200	3.57	VIII
		(75)	(60)	(39)	(26)	(0)			
10.	Easy Marketability	10	19	11	14	2	189	3.37	X
		(50)	(76)	(33)	(28)	(2)			

Source: Primary Data

Inference:

The above ranking table, using Likert Scaling technique exhibits the opinion of the respondents regarding the factors affecting purchase decision regarding the selection of jewellery shop. From the table, it is crystal clear that majority of the respondents have ranked "More designs and collections" as primary factor for their purchase behaviour and the factor was given first rank with the highest average score of 4.51. Moreover, the respondents have given 2nd rank for "brand name", 3rd rank for "more designs and collections", 4th rank for "price fluctuation", 5th rank for "reliability", 6th rank for "traditional purchase", 7th rank for "influence of peer", 8th rank for "luckiness of shop", 9th rank for "advertisement" and they have given least importance for easy marketability with the lowest score of 3.37.

Hence, it is inferred from the ranking that majority of the respondents have ranked "More designs and collections" as first prime factor for their purchase behaviour with the highest average score of 4.51 and they have given least importance for "easy marketability" with the lowest score of 3.37.

Table 1.2

Factors Affecting the selection of Branded Jewellery

S.No	Source	I	II	III	IV	V	VI	VII	Total Score	Avg Score	Rank
1.	Brand Name	12	12	9	12	6	3	2	275	4.91	II
		(84)	(72)	(45)	(48)	(18)	(6)	(2)			
2.	Quality Checking	6	10	13	10	9	7	1	249	4.44	IV
		(42)	(60)	(65)	(40)	(27)	(14)	(1)			
3.	Fair Price	11	11	9	9	8	5	3	261	4.66	III
		(77)	(66)	(45)	(36)	(24)	(10)	(3)			
4.	Best Quality	19	10	13	4	4	4	2	296	5.28	I
		(133)	(60)	(65)	(16)	(12)	(8)	(2)			
5.	Easy Availability	2	4	4	8	13	15	10	169	3.01	VI
		(14)	(24)	(20)	(32)	(39)	(30)	(10)			
6.	More designs and collections	6	8	3	8	5	15	11	193	3.44	V
		(42)	(48)	(15)	(32)	(15)	(30)	(11)			
7.	Quick Resale Value	0	1	5	5	8	5	22	127	2.26	VII
		(0)	(6)	(25)	(20)	(24)	(30)	(22)			

Source: Primary Data

Inference:

The above ranking table 3.20 exhibits the opinion regarding the attributes affecting the customers purchase behaviour of branded products. From the table, it is inherent that majority of the respondents have given 1st priority to "Best Quality" during jewellery purchase and that attribute was given first rank with the highest average score of 5.28. Moreover, the respondents have given 2nd rank for "Brand Name", 3rd rank for "Fair Price", 4th rank for "Quality Checking", 5th rank for "More designs and collections", 6th rank for "Easy Availability" and they have given least importance for "Quick Resale Value" with the lowest score of 2.26.

Hence, it is inferred from the ranking that majority of the respondents have given first priority to "Best Quality" during jewellery purchase with the highest average score of 5.28 and they have given least importance for "Quick Resale Value" with the lowest score of 2.26.

Table 1.3

Experience of the customers

Opinion	No.of Respondents	Percentage (%)
Bad quality gold became rust/turned skin green	4	20.00
Got very lowest value during resale	11	55.00
Broken after some usage	5	25.00
Looked like duplicate jewel	-	-
Total	20	100.00

Source: Primary Data

Inference:

From the table 3.28, it is clear that out of 20 respondents who have faced trouble with jewellery purchase, 20 percent of the respondents have experienced that bad quality gold became rust/turned skin green, 55 percent of the respondents have got very lowest value during re-sale and the remaining (25%) of the respondents' jewels has been broken after some usage. No one has opined that the jewels purchased in the study area looked like duplicate jewels.

Majority (55%) of the respondents have got very lowest value during resale of jewels.

FINDINGS

- ❖ It is inferred from the ranking that majority of the respondents have ranked "quality" as first main factor for their purchase behaviour and the score was given 1st rank with the highest average score of 4.51 and they have given least importance for "easy marketability" with the lowest score of 3.37.
- ❖ Majority of the respondents have given first priority to "best quality" as a prime factor to be considered during jewellery purchase with the highest average score of 5.28 and they have given least importance for "quick resale value" with the lowest score of 2.26.
- ❖ Majority (55%) of the respondents have got very lowest value during resale of jewels.

SUGGESTIONS

- The trends and preferences of the customers change from place to place and even from time to time. Currently the young girls and women are attracted towards light weight and platinum jewels. Therefore the jewellery shop can display various categories of jewels and light weight jewels so as to attract them.
- More awareness can be created among the customers to select the models and to know about the recent trends and models through Internet so as to update the customers with the new arrivals.
- The jewellery shop owners should try to get information about the long time customers and greet them on special occasions by sending birthday and anniversary cards.
- The retailers have to differentiate themselves from others in their offers and special discounts.

CONCLUSION

Consumers are at the centre of modern marketing. A manufacturer cannot be successful in the market if he does not understand his consumer, recognises his needs, identifies his product expectations, and keeps him satisfied. Consumers used to be at the mercy of a plethora of manufacturers, but nowadays, manufacturers are at the mercy of a plethora of consumers. Even though, there are many Jewellery shops in Thoothukudi people wants more variety and quality to be provided. As a result, the most important factor is customer happiness. Understanding the customer's expectations in the face of so many challenges and competitions makes keeping the consumer satisfied a difficult endeavour.

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A STUDY ON IMPACT OF ONLINE ADVERTISEMENTS AMONG COLLEGE STUDENTS IN THOOTHUKUDI CITY

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ABSTRACT

With the advancement of internet, web has become the most preferred medium for the business firms to promote their products and services. The modern business world has digitalized and people prefer to buy stuff online, which is easier, faster and considered more convenient than the traditional modes. Online advertising offers a wide spectrum of recognition, which is incomparable to any other modes of advertising. Here, the researches have used random sampling method for distributing the questionnaire in order to study on impact of online advertisement among college students in Thoothukudi. The study was carried out involving a survey on 100 sample size and chi-square analysis was used to test the hypothesis. Findings reveal that online advertisement do generate positive attitude on consumers buying behavior.

INTRODUCTION:

Advertising is derived from the Latin word 'adventure'. It means "turn people's attention to a specific thing "Advertising is a form of communication intended to promote the sale of a product or service. It is different from other forms of advertisement. The advertising message is delivered to its audience through various media including newspapers, magazines, television, radio, billboards, and direct mail. Advertising is a form of communication for marketing and is used to encourage or persuade an audience to continue or take some new action. Advertising has been defined as the science of arresting the human intelligence long enough to get money from it.

It may aim to change an attitude. The essence of advertising is to have an innovative idea, an intimate knowledge of the market about consumer behavior, a good sense of timing, and a feeling of what will work. It is a discipline about the art and science of building brands.

STATEMENT OF THE PROBLEM:

The internet has been a phenomenal and exponential growth today in the country. It is modern, powerful, and has fast growth in communication media. Millions of people are making use of the internet in their day-to-day life. Advertising has evolved over the



past century across the world. And it is very important for the people to know about the new product introduced, price, its uses, etc. Online advertising plays a very important role. It targets a large number of people at a time and the results can be known immediately. It makes a way for the consumers to compare the products. It has changed the consumer's way of buying. Thus it is necessary to find out the effectiveness of online advertising. With the growing age of the internet and the increasing trend of people using the internet for shopping and searching, internet advertising which in recent times has been utilized by all companies due to the accessibility and wide coverage than the traditional media seem to be the most recent means for advertising. Digital marketing plays an ever more central role in most businesses marketing plans. From retargeting to social; there are plenty of creative and cost-effective ways to get your brand under the noses of hundreds, if not thousands of potential customers.

OBJECTIVES OF THE STUDY:

1. To study the features, design, and significance of online advertising.
2. To find out the major challenges while using online advertisements.
3. To analyze the factors that have an impact on online advertisements on buying behavior.

METHODOLOGY:

Methodology is an essential aspect of any research. It refers to the method of generating, collecting, and evaluating the data. It enables the investigators to look at the research problems in a systematic, meaningful, and orderly way methodology comprises the sources of data collection sampling design and techniques used for analyzing the data. The study aims at the impact of online advertisement among college students. In this study, the survey method was used for the purpose of collecting data.

The data for the study were collected through the survey. The primary data were collected from the respondents through the questionnaire designed in Google forms. The secondary data has been collected by referring books, magazines, journals, articles, and websites. The study was carried out during the period from February 2022 to May 2022.

The sampling technique for this study was a convenient sampling method.



In this study, 100 respondents were selected and their response was collected using Google forms. Google forms collected from respondents were a great source of information.

The tools used for analysis are,

- Percentage Analysis
- Chi-square test
- Garrett ranking.

DISCUSSIONS:

In this chapter the findings of the study are summarized below.

- ❖ It is inferred that the majority of the respondents are female.
- ❖ It is inferred that the majority of the respondents are between the age of 21-30 years and are impacted by online advertising.
- ❖ It is inferred that majority of the respondents are graduates who are effected by online advertising.
- ❖ It is inferred that the majority of the respondents are students. It shows that students buy more in online.
- ❖ It is inferred that the majority of the respondents are those who have a monthly income of Rs 5000- Rs 10000 buy product in online.
- ❖ It is inferred that the majority of the respondents are daily users in online.
- ❖ It is inferred that the majority of the respondents said that they purchase the product in online through advertisements.
- ❖ It is inferred that the majority of the respondents said others (i.e., cosmetics, clothes, etc.)
- ❖ It is inferred that the majority of the respondents said that the information provided in the online advertisements is clear.
- ❖ It is inferred that the majority of the respondents have not published any advertisements online
- ❖ It is inferred that the majority 31 percent of the respondents like creative online advertising.
- ❖ The respondents are attracted to cost-effective.
- ❖ It is conducted that there is no significant relationship between age and awareness about the online advertisement.
- ❖ It is inferred that the majority of the respondents reach the customers directly by



advertisingthe product online.

- ❖ It is inferred that the majority of the respondents agree that there are long-term benefitsby online advertisements.
- ❖ It is inferred the majority of the respondents said consumer goods are suitable for onlineadvertising.
- ❖ It is inferred that the majority of the respondents compare the price through onlineadvertising.
- ❖ It is inferred that majority of the respondents buy mobile through online advertisements.
- ❖ It is inferred that the majority of the respondents say that online advertisements issuitable for online business people.
- ❖ It is inferred that the majority of the respondents are benefited from online advertisements to do many online course.
- ❖ It is inferred that most of respondents ignore the online advertisements which falls as amajor disadvantage.

CHI SQUARE TEST:

HYPOTHESIS: H₀

There is no significant relationship between age and awareness about online advertisements.

HYPOTHESIS: H₁

There is a significant relationship between age and awareness about online advertisements.

Degree of freedom = (r-1)*(c-1)

$$= (6-1)*(4-1)$$

$$= 5*3$$

$$= 15$$

The above table indicates 15 degrees of freedom is 24.996. The calculated value is 3.14, which is lesser than the calculated value thus the result is dependent. **Hence it is concluded that there is no significant relationship between age and awareness about the online advertisement.** Therefore, the null hypothesis (h₀) is rejected.



GARRETT RANKING:

Percentage position	Garrett value
8.33	75
25	60
41.67	50
58.3	34
75	24
91.67	27

From the above table the importance of online advertisement is shown. The respondents are attracted to cost-effective and therefore ranked first, target audience ranks second, access to data ranks third, engaging with customers ranks fourth, fast and easy ranks fifth, and others rank sixth.

SUGGESTIONS:

- Online advertisements must be genuine and not fake.
- The overall content in an online advertisement must be meaningful, catchy and provocative.
- Online must not be bombarded with too many advertisements.
- Les-spammed advertisements must be introduced.
- Advertisements must be creative because creativity plays an important role and coversmajority of people.
- The standard of the advertisement has to be improved.
- Online advertisements must provide cost effective products so that it reaches every cornerof the world without any difference in race, money etc.
- The people who are not aware about online advertisements must be educated.
- Many online advertisements are misleading and many problems arise due to false advertisements.
- Village people should be given awareness to access online advertisement.
- A detailed description of the products or websites must be given in most cases for the safetyusage of the products or websites



CONCLUSION:

Online advertising is a form of mass communication. It is essential for the success of any business in a market economy. Product image is more important in providing specific information than providing a piece of specific information about a product or service and this can be done through online advertising to reach the mass level of people globally.

The modern world is a competitive one. Online advertising plays an important role in the modern marketing system and economic growth. Online advertising has become inevitable for capturing the market for produces and services.

Measuring the effectiveness of online advertising is a complex matter especially in a perpetually changing environment where new resources, formats and uses are constantly being developed. It is very hard to predict the future of online advertising because this industry is too young to allow analysis to reach any concrete. Online advertising can be very fruitful in creating brand awareness. Companies can opt for online advertising for aggressive promotion of their products. The study will be helpful for advertisers as they will be able to optimize their efforts and marketing budget towards the appropriate head.

On the basis of the current study. Online advertisements have a significant effect on creating awareness among consumers. The study also concludes that online advertisements are very reliable in generating awareness and providing the right information about the products and services.

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**A STUDY ON IMPACT OF E-COMMERCE ON RETAIL BUSINESS IN
THOOTHUKUDI DISTRICT**

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ABSTRACT

Internet plays an important role in daily life and in every single work we use internet. Before e-commerce commence buying and selling were done physically in the markets but after the arrival of e-commerce in India, life has become more convenient because of its advantages. Online shopping is a part of e-commerce which is done mostly by the users through e-commerce websites across the world, which allows to buy and sell the products according to choice at affordable price. E-commerce website has a lot of impacts on different markets and retailers.

1. INTRODUCTION:

E-Commerce is buying and selling of goods and services over the internet. It offers shopping of anything at any time and at any place, when customers can not find the products available in physical markets, at least cost and time. In fact, E-commerce is a part of e-business which focuses on external activities. While E-business focuses on both internal and external activities of a business. E-commerce has a lot of good and bad impacts on different areas. The key of having a successful E-commerce is to reduce the negative impacts and increase the benefits at the same time.

2. REVIEW OF LITERATURE

Saha (2015) in his paper on the topic “The impact of online shopping upon retail trade business” highlighted the impact of the increasing trend of online shopping over the various fixed shop retailers. The study found several driving factors which influence consumers to shop online: e.g. price, convenience in shopping and wide range of available products available online.

Hsiao and Ming Husing (2008) conducted a study on “shopping mode choice: Physical store shopping verses e- shopping” The study considered the competition between store shopping and e shopping by examining their relative advantages in some specific time and cost attributes. It was found that purchasing online saves time and travel cost, which is worth



avoiding a shopping trip even though customers have to wait for the product till their delivery.

Shim et al (2000) in their article “Assessing the impact of internet shopping on store shopping” found that consumers attitude towards the internet shopping and factors that influence consumers to purchase online. The study concluded that internet shoppers tend to search for product information on the internet to a greater extent which is easily available and is an important tool that directs sales.

3. STATEMENT OF THE PROBLEM

The study focuses on impact of e-commerce on selective conventional retail stores. The study was conducted in area of Thoothukudi district. The study shows how conventional retail stores are affected through online shopping. The study also discussed the measures taken by retail stores to overcome the problems faced by them due to the advent of online shopping. Thoothukudi is a district which has a wide range of Retail business. E-commerce is growing quickly owing to its widespread use of the internet. The impact of e-commerce has both its pros and cons with connection to the retailers. The retail industry was in decline as e-commerce took over. Here the research is been finding out new ways to connect with their customers. As technology is rapidly evolving, there is greater need for retailers to improve their business.

4. OBJECTIVES OF THE STUDY

The objectives of the study are,

1. To study the impact of price variations in retail business.
2. To analyse the problems faced by retailers due to the evolution of online shopping.
3. To give valuable suggestions to improve retail business.

5. METHODOLOGY

Data Collection:

Primary data was collected from 120 respondents who are all retailers in Thoothukudi district. The secondary data are collected from various journals, websites, books, magazines other printed and published sources.



Sample design :

Sampling is the process of collecting information only from a representative part of population from among various retailers; the sample size selected was 120. The tools for collecting the data was questionnaire. Random sampling method was adopted for its convenience. The questionnaire was designed keeping in view of the objectives of the study. The questionnaire was designed such that it helps to elicit accurate information. The questions were close ended for the respondents to answer easily.

6. AREA OF THE STUDYA study on impact of e-commerce on retail business in Thoothukudi district was conducted in the area of Thoothukudi. It is a port city and an industrial city of the Indian state of Tamilnadu. The researcher has covered Puthiamputhur, Tharuvaikulam, Cruzpuram and Therespuram area.

7. DATA ANALYSIS AND INTERPRETATION

1. Categorization of setting the price

Category	No of Respondents	Percentage (%)
Cost Orientation	27	22
Competition	31	26
Customer Orientation	38	32
Value Based	24	20
Total	120	100

Source: Primary data

It is evident from the above table that, 22 percent of the respondents said price is being set based on cost, 26 percent of the respondents said price setting is as per competition, 32 percent of the respondents said price setting is fully on customer orientation and remaining 20 percent of the respondents said price setting is based on value.



2.PROFIT MARGIN BEFORE ONLINE BUSINESS

Margin	No of Respondents	Percentage (%)
5 to 10 %	36	30
11 to 15 %	49	41
Above 15 %	35	29
Total	120	100

Source: Primary data

It is evident from the above table that, 30 percent of retailer’s profit margin is between 5 to 10%, 41 percent of retailers profit margin is between 11 and 15% and 29 percent of retailers profit margin is above 15% before the introduction of online business.

3. REASON BEHIND LOW PRICE OF ONLINE PRODUCTS

Reasons	No of Respondents	Percentage (%)
Substandard quality products	46	38
Second hand products	44	37
Less number of middlemen	30	25
Total	120	100

Sou

Source: Primary data

The above table shows that 38 percent of retailers says that reason behind low price of the online product is substandard quality, 37 percent of retailers says that reason behind low price of the online product is second hand products and 25 percent of retailers says that reason behind low price of the online product is due to less number of middlemen.

4. PROBLEM FACED BY RETAILERS

Problems	Average	Rank
Lower level of profit	3.6	VII
Increasing discounts and offers	3.8	V
Transportation charges	3.4	X

Online competition	3.5	VIII
Bargaining	3.9	IV
Lack of infrastructure and logistics	3.7	VI
Evolving customer’s expectation	4.1	II
Lack of technology adoption	4.0	III
Frauds in retail	3.2	XI
Scarcity of skilled workforce	3.5	VIII
Ever increasing customer demand	4.2	I
Verge of closure	2.5	XII

Source: Primary data

The above ranking table evidently shows, the problems faced by retailers and the analysed factors are as “Ever increasing customer demand” has been ranked I, with the highest average score of 4.2, They also have opined that “Evolving customer’s expectation” has been ranked II, “Lack of technology adoption” has been ranked III, “Bargaining” has been ranked IV, “Increasing discounts and offers” has been ranked V, “Lack of infrastructure and logistics” has been ranked VI, “Lower level of profit” has been ranked VII, “Online competition” and Scarcity of skilled workforce” has been ranked VIII, “Transportation charges” has been ranked X, “Fraud in retail” has been ranked XI and “verge of closure” has been ranked XII with the least average score of 2.5

5. MEASURES AND SUGGESTIONS TO ENHANCE RETAILERS

Measures and Suggestions	Yes	Percentage (%)	No	Percentage (%)
Sell products at online price	78	65	42	35
Combine E-commerce in your retail business	82	68	38	32
Sales will increase if you have E-market	82	68	38	32
Competition in E-commerce is universal	83	69	37	31

Source: Primary data



It is evident from the above table that 65 percent of respondents suggested that retailers are to sell at online price and 35 percent of respondents suggested that retailers are of view that they need not sell at online price,68 percent of respondents suggested that combine E-commerce in their retail business and 32 percent of respondents are not suggested to combine E-commerce in their retail business,68 percent of respondents suggested that sales will increase if they have E-market,32 percent of respondents says that Sales will not increase if they have E-market and 69 percent of respondents suggested that Competition in E-commerce is universal.

8. FINDINGS :

- ✓ The retailers mostly prefer customer oriented pricing for setting the price to the customers
- ✓ The retailers profit margin before online business is between 11 and 15%
- ✓ The retailers reason behind low price of online shopping is due to substandard quality of products
- ✓ Ever increasing customers demand is the problem highly faced by the retailers
- ✓ Modern retailing is to have online platform for every retailers and was suggested highly by the respondents

10. SUGGESTIONS :

The following are the suggestions based on research work

- ❖ The retailers need to make substantial investment in acquiring some advanced expertise in developing more accurate and scientific models.
- ❖ The existing small and medium independent retailers is to closely examine were changes that are taking place in their immediate vicinity.
- ❖ Retailers have to change the attitude towards customers and the market, fixing their priority as consumer satisfaction tools used by the stores are discounts and coupons, exchange offers, low priced product.
- ❖ Modern retailing is to have online platform for every retailers and was suggested highly by the respondents.
- ❖ Create new opportunities for customers to purchase more frequently from the stores.
- ❖ Retailers should also keep goods return policies and cash back offers.



10.CONCLUSION

The face of retail has changed. The advent of technology in recent period is the primary reason for it. It is important to every one of the divisions of retailers to think about their difficulties to develop in the market. This reasonable investigation thinks about the web based shopping or web based retailing and it gives the same image about how purchasers move to online stores.

Although the retail scenario is changing, on small retailers are missing out somewhere, the nearby store is always the most approaching for all reasons and seasons. They meet to just uplift the pattern of business and face the competitive world with the better positive approach. Both e-stores and retail stores have to survive in their own way. They both are providing livelihood to thousands of people.

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A STUDY ON WOMEN ENTREPRENEURS IN THOOTHUKUDI

ENGAGED IN FOOD PROCESSING

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ABSTRACT

Local food production is meaningful not only for a single producer but also for the consumer, and finally for the entire region. Therefore, it would be beneficial to take up the issue of local entrepreneurship in the context of food production. The aim of the study was to analyze important terms, research topics, and research results related to the issue of local entrepreneurship in the context of food production. The literature review revealed definitional discrepancies related to the subject of the study. Thus, the need to create an unambiguous definition of local food and local entrepreneurship was emphasized. This study enables the readers to have clear information about an analysis of women entrepreneurs engaged in food processing. The data analysis is conducted with the help of suitable statistical tools. The conclusion of the study is inferred from the findings and suggestions. The introduction explains the main aim of the study.

Keywords: Entrepreneurship, local food, women entrepreneurs, food production.

INTRODUCTION:

Entrepreneurship is suitable to women and it is possible to do work when she has free time. Self-employed women has no restrictions and time bound work which makes it easy for her to manage the responsibilities of work, home and child at a time. Secondly, it is convenient for women to be in control of a small business. This pattern of working in small business suits her dual role. With this, there is a growing realization that the strength of a country is in the small business. Women entrepreneurs today have their own opinion, are self assured, able to withstand all risk and are efficient managers. In spite of dual responsibilities, many women plan their lives very skill fully and succeed in filling these dual roles in a smooth way. The experience gained outside her home enables her to enrich family relationship s through new outlook on tradition in a changing world. By continuously seeking



connection with the world of science and culture, she can become a better organizer and help to promote growth. Woman entrepreneur is entitled to necessary backup support of specialized and experienced persons. The need for providing proper environment for entrepreneurship is of vital importance. Desirable qualities may be developed by training. To change the social and economic structure of our country and to up lift the disadvantaged section of the society like women, greater emphasis is needed on entrepreneurial development. Human resources, both men and women, of working age constitute the main strength of economic development of a nation. Women form an important segment of the labour force and the economic role played by them cannot be isolated from the framework of development. The role and degree of integration of women in economic development is always an indicator of women's economic.

REVIEW OF LITERATURE:

V Krishnamoorthy and RBalasubramani (2014), identified the important women entrepreneurial Motivation factors and its impact on entrepreneurial success. The study identified ambition, skills and knowledge, family support, market opportunities, independence, government subsidy and satisfaction are the important entrepreneurial motivational factors. The study also concluded that ambition,, knowledge and skill,, independence,, dimensions of entrepreneurial motivational has significant impact on entrepreneurial success.

. G. Palaniappan, (2012) in their article analyzed that women have been successful in breaking their barriers within the limits of their homes by entering into varied kinds of professionals and services. Skill, knowledge and adaptability in business are the main reasons for women to emerge into business ventures. This study had also been carried out to analyze the motivational factors and other factors that influence women to become entrepreneurs, the major strength and weakness of women entrepreneurs and the environmental opportunities and threats which promote the entrepreneurship, and to offer suggestions to promote women entrepreneurship of selected districts in Tamilnadu. This study concluded that due to lack of training and education they are not able to survive in the market. Finance is also the major problem for women entrepreneurs.



STATEMENT OF THE PROBLEM:

The problems that present day working women face can be traced back through history to the Neolithic times when a division of labour already existed on the basis of sex. In those days also, men hunted and women gathered roots and fruits. The women’s capacity to give birth, a capacity that men lacked, quit naturally gave women a prominent place in the early agricultural society. So, at this time women and men were already doing different kinds of work, but women were not apparently subordinates to men.

Women are conditioned with the multiple responsibilities. They want to be efficient workers and try hard to fulfill the job duties. At the same time they want to be good wives, good mothers and better home managers. She wants to maintain her status in the society and be respected by the other members of the family. Her sincerity towards all the responsibilities is itself a cause of trouble. Women entrepreneur started their career in food process unit like pickle, papad, flour, cakes, breakfast cereals, rolls, milk products, masala, cookies etc.

Thus, the researcher is interested to know the women entrepreneur engaged in food processing.

OBJECTIVES:

- ✓ To find out the impact of economic factors on women entrepreneurs in food processing activity.
- ✓ To find out the extent in which women entrepreneurs are successfully engaged in food processing.
- ✓ To know about the problems faced by women entrepreneur engaged in food processing work.

RESEARCH METHODOLOGY:

Sampling design	Convenient sampling method
Period of the study	February 2022 to May 2022
Data used	Primary and Secondary data
Test for analysis	Percentage Analysis, Chi-Square test, Garrett ranking method, correlation coefficient.



LIMITATION OF THE STUDY:

In attempt to make this project authentic and reliable, every possible aspect of the topic was kept in mind. The main limitations are:

- ❖ Time is one of the major constraints, which limits the effectiveness of data collection.
- ❖ The number of respondents is limited to 80.
- ❖ Some information cannot be accessed due to its confidential nature.
- ❖ Reliability and accuracy of the analysis depends on the respondent’s openness and trueness towards each question in the questionnaire.

RESULTS AND DISCUSSION:

Motivation to become an entrepreneur

Motivation of entrepreneur	No. of respondents	Percentage of respondents
Family member	24	30
Friends and relatives	16	20
Self	29	36
Others	11	14
Total	80	100

Status before establishment of current business

Status before entrepreneurs	No. of respondents	Percentage of respondent
House wife	31	39
Service	12	15
Daily wager	13	16
Salaried employee	24	30
Total	80	100

CHI – SQUARE TEST

Respondents preference towards the production through make food product.



Chi – square test was applied to find out whether there is any significant difference type of production and make food product about transport fuels in the following factors.

The χ^2 test is used to understand the accuracy of the variables use and to find out whether they are independent or dependent it is applied to validate the results of the study.

$$X^2 = \sum(O-E)^2/E$$

Where,

O = Observed frequency

E = Expected frequency

\sum = Summation

X^2 = Chi – Square value

Expected frequency = Row total \times column total / Grand total

HYPOTHESIS (H_0):

There is no significant relationship between the respondent's preference towards the production through make food product.

ALTERNATIVE HYPOTHESIS (H_1):

There is a significant relationship between the respondent's preference towards the type of production through making their food product.



CHI – SQUARE TEST:

Make your food product Type of Production	Prepared by workers at their home	Prepared at the production unit	As per the circumstances	Others	Total
Masala	7	5	2	4	18
Pickle	8	2	9	3	22
Milk products	2	4	7	3	16
Others	6	11	4	3	24
Total	23	22	22	13	80

Degrees of freedom:

$$= (r-1) (c-1)$$

$$= (4-1)(4-1)$$

$$= 3 \times 3$$

$$= 9$$

The above table indicates 9 degree of freedom 16.9. The calculate value is 40.49 which is greater than the calculate value thus the result is independent. Therefore the null hypothesis (H_0) is accepted.

FINDINGS:

- The following are the findings in regard to various responses from the respondents regarding the study on women entrepreneurs engaged in food processing.



- Majority of the respondents say that it is the self motivation to become an entrepreneur.
 - It is observed from the study that most of the respondents financial need is the reason of becoming an entrepreneur.
 - The study reveals that most of the respondents are house wife in status before establishment of current business.
 - It is found that most of the respondents experience are helpful in fully in doing the current business.
 - Most of the respondents say that the production unit stated up above 5 years.
 - Majority of the respondents think that they purchases in enough quantity the raw materials
 - Majority of the respondents say that they store raw materials in their own unit.
 - Majority of the respondents test the quality in raw materials.
 - Majority of the respondents test the raw material at the time of purchases.

SUGGESTIONS:

Following are the suggestions based on the research work.

- Food entrepreneurs should keep the stock at sufficient level.
 - To overcome with the problem of underutilization of capacity food processing should adopt the proper and reliable source of raw material and also the advanced production technology.
 - Food entrepreneurs should adopt the proper initiatives to increase the profit margin to sustain the business
 - Women entrepreneurs should maintain the advanced computerized financial accounting to use the various techniques of analysis.
 - Women entrepreneurs should increase their sustainable profitability though their suppliers give them the credit facility.
- Entrepreneurs should have some basic knowledge about their financial management and they should update this knowledge.



CONCLUSION:

Indian food processing is a growing industry and presents a large opportunity to the entrepreneurs for the development of the rural areas. However, there are many challenges in the food processing entrepreneurship that are hindering the economical and viable processing unit. The study indicated that lack of government support, quality, and quantity of raw material, seasonality, inadequate infrastructure, access to the latest technology, poor access to credit, lack of export support, lack of trained manpower, inadequate training practices, and wastage constitutes serious challenges for food processing entrepreneurship which are affecting the growth of rural development. To overcome these challenges Government needs to properly address and take some steps regarding the development of rural entrepreneurs like training programs, favorable policies, favorable initiatives/schemes, financial support, infrastructure development in the rural areas, etc.

Local food production is meaningful not only for a single producer but also for the consumer, and finally for the entire region. Therefore, it would be beneficial to take up the issue of local entrepreneurship in the context of food production.

The entrepreneurial traits which are an open culture, outcome-oriented, team-oriented proactive, networked, open risk-taker, observant, visionary, and failure is an option are important meanwhile every entrepreneur must have these characteristics when they carry out their businesses. Those successful entrepreneurs applied their characteristics well in their businesses. We can use all entrepreneurial traits to succeed in our life. So, we should learn from them and look to them as role models for a successful life.

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A STUDY ON CUSTOMER SATISFACTION TOWARDS NATURAL HEALTHY DRINKS IN THOOTHUKUDI

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ABSTRACT

Customer satisfaction reflects a desire to use a particular company's products or services even when there are equally- priced and equally- available alternatives. Customer Satisfaction is important to companies because it provides an indicator of their customers' loyalty, the success of their marketing tactics and the strength of their respective brands. The current technology has entirely changed the living patterns. Now a days quick food styles are catching up fast because of a greater number of working couples, domestic fuel crisis, nonavailability of reliable domestic servants and breaking up of joint family system. Capitalizing this situation, business houses ranging from small scale manufactures to multinational corporations have started innovating and commercializing 'easy to use health drinks. Health drinks have emerged as the most profitable and growing segment of the overall soft drinks industry in the world. This study enables the readers to have a clear information about the customer satisfaction towards natural healthy drinks. The data analysis is conducted with the help of the suitable statistical tools. The conclusion of the study is inferred from the findings and suggestions. The introduction explains the main aim of the study.

1. INTRODUCTION:

Customer satisfaction is a marketing term which measures the products or services supplied by the company. It is used to know level of satisfaction about the product which is to be improvised before marketing. Customer satisfaction involves measurement of the expectation and actual satisfaction level regarding the products and services they have consumed. It involves factors like quality and quantity of the product and service provided by the company. To know the level of customer satisfaction of the product, business uses the survey method. Consumer has values, perceptions and behaviour pattern which are the results of environmental influences. Leisure, health factors and life style have a major role in influencing the buying behaviour of a customer. Research helps to track cultural shifts that might suggest new ways to market and trade to consumers. Analysis/measurement of buying



behaviour about health drinks is difficult because health drinks are available in the market together with conventional ones and the buying decision depends on many factors that can vary sharply across individuals. organization needs to gain an understanding of how their characteristics and decision-making process relate to the products or the services they choose, the brand they select and the outlet at which they buy the product, the time it takes them to decide which products to buy and the amount purchased.

2. REVIEW OF LITERATURE:

Mrs. J.Tamilselvi**Mr.M.Kirubaharan** (2010) analysed consumer preference towards health Drinks'. Which is the primary need for adults as well as children; based on various aspects the objective of this study is to understand the customer children, based on various aspects. The objective of this study is to understand the customer behavior in the “Health Food Drink (HFD)” product category. To identify the factors those influence a person into making a decision to buy Science, Technology and Development Volume IX Issue X OCTOBER 2020 ISSN : 0950-0707 Page No : 284 a certain brand of malt- based health drink. The aim of the study also included identifying the determinant t purchase factors, the customer segments and the sources of information they rely on. Since nutritional level in India is less compared to other countries, the people should take necessary steps to maintain their daily nutritional level which can be done through balanced diet, nutrional food and health drinks. This may reduce many physical problems which they may face in the future.

Rohini Radhakrishnan,2021 When it comes to staying hydrated, flushing out toxins, and maintaining healthy organs, water can't be beat. But what if your child doesn't like drinking plain water, and wants more options for their 8-ounce cups of fluids a day? Here is **green tea, Mint tea** orange and lemon juice and etc besides water that don't contain artificial or sugary ingredients and are both easy to prepare at home and inexpensive.

3. STATEMENT OF PROBLEM:

In this modern world, health drinks are gaining popularity. Every day one wakes up to an advertisement announcing the arrival of new health drinks in the market. Paying attention to customers is the key to understanding their likes and dislikes. It is, therefore, important that, an organization invests as much as possible in understand this study has been conducted in order to know the customer satisfaction towards health drinks. So, this study is conducted to determine the customer satisfaction and key driving forces for the customers.



4. OBJECTIVES OF THE STUDY:

1. To understand the consumer attitude and satisfaction towards natural healthy drinks.
2. To analyse the factors influencing is buy natural healthy drinks.
3. To identify the importance of natural healthy drinks.
4. To determine the frequency consumption of natural healthy drinks.

5. AREA OF THE STUDY:

This study was conducted with in Thoothukudi city.

6. METHODOLOGY

PRIMARY DATA: The primary data consisting of various questions relating to the attitude of consumers. The primary data have been collected from some consumers after discussing and 120 samples an taken for the research.

SECONDARY DATA: The secondary data is collected from the hacks, articles, magazines, popular websites and other sources of social media.

SAMPLE DESIGN: The questionnaire collected was great source of information. By adopting convenient sampling method, a sample of 120 respondents was selected from Thoothukudi.

7. ANALYSIS AND INTERPRETATION

1. The factors influencing is buy natural healthy drinks

Preference	No of respondent	Percentage	Rank
Butter milk	28	23	I
Tender coconut	18	15	III
Fresh juice	26	22	II
Vegetables juice	12	10	IV
Sugar cane	10	8	V
Ragi malt	18	15	III
Pathaneer	5	4	VI
Others	3	3	VII
Total	120	100	

2. The consumer attitude and satisfaction towards natural healthy drinks.



Factors	No. of respondents	Percentage (%)	Rank
Price	25	21	II
Taste	31	26	I
Varieties available	20	17	IV
Nature content	24	20	III
Offer and free gift	15	12	V
Others	5	4	VI
Total	120	100	

3. The importance of natural healthy drinks

Benefits	No of respondents	Percentage (%)
Improved concentration	18	15
Increased physical stamina	26	22
Improved memory power	48	40
Improved haemoglobin	18	15
Others physical benefit	10	8
Total	120	100

4. The frequency consumption of natural healthy drinks

Options	No. of respondents	Percentage (%)
Very often	72	60
Occasionally	36	30
Rarely	12	10
Total	120	100



8. FINDINGS

- Majority of the respondents have given first priority to Butter milk.
- Majority of the respondents preferred taste.
- Majority 40 % of the respondents have derived benefit from improved memory power.
- Majority 60% of the respondents are very often switch over natural healthy drinks

9. SUGGESTIONS

- The price structure of certain drinks like for buttermilk and sugar cane is high. Hence suggest to the reduce price.
- It is better to avoid chemical in the natural healthy drinks
- Conduct healthy awareness programmes about the importance and benefits for consuming natural healthy drinks.
- It's generally best to avoid sugary drinks like soda, sports beverage, and energy drinks

10. CONCLUSION

The people should take necessary to maintain their daily natural healthy drinks level which can be done though balanced diet, natural healthy drinks. This may reduce many physical problems in the future. In any, product customer notices price, quality and hygiene and services which has been given notify by the customer during the purchase of the drinks. Natural healthy drinks help in improving the health, physical appearance and rich in natural healthy drinks value. There are also some factors like price plays a significant role in buying behaviour of customers. All the people whether young or old like natural healthy drinks. They take natural healthy drinks for relaxation, refreshment and to get energy. The natural healthy deinks have become part and parcel of their lives.

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**A STUDY ON WORK LIFE BALANCE OF FACULTIES IN SCHOOLS AND
COLLEGES IN THOOTHUKUDI**

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ABSTRACT

Work life balance has always been a concern of those interested in the quality of working life and its relation to broader quality of life. The concept of work life has been abstracted from the job satisfaction level of an employee, which is an extrinsic factor of job satisfaction. Faculties not only look forward towards teaching, but also needs to focus on soft skills and life skills so that they not only produce good professionals but also develop good citizens. The present study investigated the Work Life Balance of Faculties in Schools and College in Thoothukudi. The Primary data has been collected by conducting a descriptive survey among 100 samples of faculties in Thoothukudi district in the State of Tamil Nadu. The data are analyzed using various statistical tools and methods. However, there is no significant relationship between Gender and Work Life Balance.

Key Words: Work life balance, Faculties, Work satisfaction, Family.

1. INTRODUCTION:

Work Life Balance can be defined as the perfect integration between work and life both not interfering with each other. Work life balance has always been a concern of those interested in the quality of working life and its relation to broader quality of life. The concept of work life has been abstracted from the job satisfaction level of an employee. Professional life means the aim to grow and earn respect in the institutions and society at large and Personal life means taking care of family, children, parents, health and spending the leisure time effectively. With the development in educational, economic and social standards, things have improved to a great extent and the role of faculty in balancing their lifestyle. Work – life balance for teaching professional has become one of the greatest challenges in the world.

2. REVIEW OF LITERATURE:

VandanaPunia,MeenakshiKamboj(2013)ⁱ,Work-life balance is a critical aspect to enhance teacher effectiveness and satisfaction in the context of student learning. It has been proved time and again that a good quality of work life balance results into the wellness of the faculty and also improved student behaviour. The present study investigated the quality of work-life



balance among Indian teachers serving in different academic stream across universality and colleges.

NahidDarakhshan (2014)ⁱⁱ, The study aims to investigate the level of Job Satisfaction among female faculties. The study also investigates the effect of Occupational Stress and Work-Life Balance on Job satisfaction. A self-structured questionnaire is adopted to accomplish the research objectives through the responses from 120 female faculty. Various statistical tools and methods such as descriptive statistics and regression analysis etc. have been used to analyse the data. The results of the study reveal that a significantly high level of job satisfaction exists among female faculty. The results also reveal the existence of significantly low negative effect of Occupational stress and low positive effect of Work-Life Balance on the degree of job satisfaction of female faculty. This study makes a significant contribution to the existing body of Kethledge by exploring the relationship between Occupational stress, Work-Life Balance, and Job Satisfaction.

3. STATEMENT OF THE PROBLEM:

With the development in educational, economic and social standards things have improved to a great extent and the role of faculty in balancing their lifestyle. Work life balance for teaching professionals has become one of the greatest challenges in the world. Faculties need to spend extra hours every day to be effective and productive in their profession. So that they could reach higher levels and to face the challenging atmosphere. Maintaining work life balance is not only important for their personal health and relationships, but it can also improve the efficiency of their work performance, ability to achieve work life balance is becoming more and more difficult. Hence, teaching professionals needs a very much consideration in maintaining their work life balance. The present study is focusing attention on action of actual Work Life Balance of Faculties in Schools and Colleges in Thoothukudi.

4. OBJECTIVES OF THE STUDY:

1. To study the impact of demographic variables on work life balance.
2. To study the work life schedule of faculties of schools and colleges.

5. METHODOLOGY:

PRIMARY DATA: The Primary data has been collected by conducting a descriptive survey among 100 samples of faculties in Thoothukudi district in the State of Tamil Nadu.

SECONDARY DATA: The Secondary data is collected from articles, journals, websites through internet and books from renowned authors.



SAMPLE DESIGN: The data collected are original in nature. A sample of 100 faculties in various parts of Thoothukudi were selected by convenient sampling technique. The data for the study was collected using questionnaire through google form.

- Time is one of the major constraints, which limits the effective data collection.
- The number of faculties is limited to 100 which are very few when compared to the entire population.
- Some information cannot be accessed due to the confidential nature of the faculties.
- The questionnaire was circulated in specific regions of Thoothukudi. So, the results occupied may diverge in other regions.

7. ANALYSIS AND INTERPRETATION:

TABLE 7.1:CHI-SQUARE TEST RELATIONSHIP BETWEEN GENDER AND WORK LIFE BALANCE

NULL HYPOTHESIS:H₀ -There is no significant relationship between gender and work life balance.

ALTERNATIVE HYPOTHESIS:H₁ or H_A -There is a significant relationship between gender and work life balance.

ROW/COLUMN	O	E	O-E	(O-E) ²	(O-E) ² /E
R1C1	35	35.52	-0.52	0.27	0.007
R2C1	13	12.48	0.52	0.27	0.02
R3C1	0	0	0	0	0
R1C2	19	20.72	-1.72	2.95	0.14
R2C2	9	7.28	1.72	2.95	0.40
R3C2	0	0	0	0	0
R1C3	20	17.76	2.24	5.01	0.28
R2C3	4	6.24	-2.24	5.01	0.80
R3C3	0	0	0	0	0
TOTAL	100				1.64

OPINION GENDER	YES	NO	SOMEWHAT	TOTAL
MALE	35	19	20	74
FEMALE	13	9	4	26
TRANSGENDER	0	0	0	0
TOTAL	48	28	24	100

Degree of freedom = (r-1) * (c-1)

$$= (3-1) * (3-1)$$

$$= 2*2$$

$$= 4$$

The table value at 4 degrees of freedom at 3% level of significance is 9.48. The calculated chi-square value is 1.64. Since the calculated value is less than the table value, the null hypothesis H_0 is accepted. Hence it is concluded that there is no significant relationship between Gender and Work Life Balance.

TABLE 7.2 RELATIONSHIP BETWEEN AGE DEPRESSION OF WORK

OPINION AGE	NEVER	RARELY	SOMETIMES	OFTEN	ALWAYS	TOTAL
Below 30	4	5	4	1	9	23
31-40	3	12	9	2	6	32
41-50	1	12	5	5	5	28
Above 50	1	5	5	3	3	17
TOTAL	9	34	23	11	23	100



ROW/COLUMN	O	E	O-E	(O-E)	(O-E) ²
R1C1	4	2.07	1.93	3.72	1.79
R2C1	3	2.88	0.12	0.01	0.003
R3C1	1	2.52	-1.52	2.31	0.91
R4C1	1	1.53	-0.53	0.28	0.18
R1C2	5	7.82	-2.82	7.95	1.02
R2C2	12	10.88	1.12	1.25	0.11
R3C2	12	9.52	2.48	5.65	0.61
R4C2	5	5.78	-0.78	0.60	0.10
R1C3	4	2.07	1.93	3.92	1.89
R2C3	9	7.36	1.64	2.68	0.36
R3C3	5	6.44	1.44	2.07	0.32
R4C3	5	3.91	1.09	1.14	0.29
R1C4	1	2.53	1.53	2.34	0.92
R2C4	2	3.52	1.52	2.31	0.65
R3C4	5	3.08	1.92	3.68	1.19
R4C4	3	1.87	1.13	1.27	0.67
R1C5	9	5.29	3.71	13.76	2.60
R2C5	6	7.36	-1.36	1.84	0.25
R3C5	5	6.44	-1.44	2.07	0.32
R4C5	3	3.91	-0.91	0.82	0.20
TOTAL	100				14.28

Degree of freedom = (r-1) * (c-1)
 = (5-1) * (4-1)
 = 4*3
 = 12



INFERENCE:

The table value at 12 degrees of freedom at 5% level of significance is 21.02. The calculated chi-square value is 14.28. Since the calculated value is less than the table value, the null hypothesis H_0 is accepted. Hence it is concluded that there is no significant relationship between Age and Depression of Work.

TABLE 7.3 HOURS OF WORK PER DAY

This table shows the number of working hours of faculties per day in the institution.

NO. OF HOURS	NO. OF FACULTIES	PERCENTAGE (%)
Below 5 hours	6	6
5-7 hours	55	55
7-9 hours	36	36
Above 9 hours	3	3
TOTAL	100	100

INFERENCE:

The above table concludes that 55 % of the faculties work 5-7 hours in a day, 36 % of the faculties work 7-9 hours in a day, 6 % of the faculties work below 5 hours in a day and 3 % of the faculties work above 9 hours in a day.

TABLE 7.4 TIME SPENT WITH CHILDREN

This table shows the time spent by the faculties with their children.

NO. OF HOURS	NO. OF FACULTIES	PERCENTAGE (%)
Less than 2 hours	20	20
2-3 hours	39	39
3-4 hours	29	29
4-5 hours	12	12
TOTAL	100	100

INFERENCE:

The above table concludes that 39 % of the faculties spend 2-3 hours with their children, 29 % of the faculties spend 3-4 hours with their children, 20 % of the faculties spend less than 2 hours with their children and 12 % of the faculties spend 4-5 hours with their children.



8. FINDINGS:

- Majority 55 % of the faculties work 5-7 hours in a day
- Mostly 39 % of the faculties spend 2-3 hours with their children
- Mostly 48% of the faculties are not able to balance their work and family equally.
- Mostly 46% of the faculties are dissatisfied for their current work life balance.
- Mostly 38% of the faculties are tired and depressed because of work.
- Majority 55% of the faculties are working 5-7 hours per day.
- Majority 57% of the faculties are affected by headaches due to work pressure.
- Majority 59% of the faculties are satisfied with their current salary.
- Majority 60% of the faculties are not able to balance their work life

9. SUGGESTIONS:

- When actual recognition, appreciation & encouragement is given it motivates the faculties.
- Conduct counselling programs for the faculties.
- Arrange recreational activities amidst the busy schedule which will give them a peace of mind.
- Introduce more flexi-time arrangements for the female faculties for child and elderly care.
- Provide fair and adequate compensation for newly joined faculties.
- Make provision for Leave Encashment so that faculties may have time for their personal space.

10. CONCLUSION:

It is very important for institutions to improve and retain the work life balance for their staff. From the study it is concluded that professional satisfaction and personal satisfaction of the teachers is very important for WLB. Further it is also very important for institutions to frame and implement effective Work Life Balance Policy. This will in turn enhance the job satisfaction level of teachers, spend time with family on a quality basis with space for personal life. Since there is a balance between the work and personal lives, this will make



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faculties less stressed and it motivates them to give their best to the student community and future society.

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