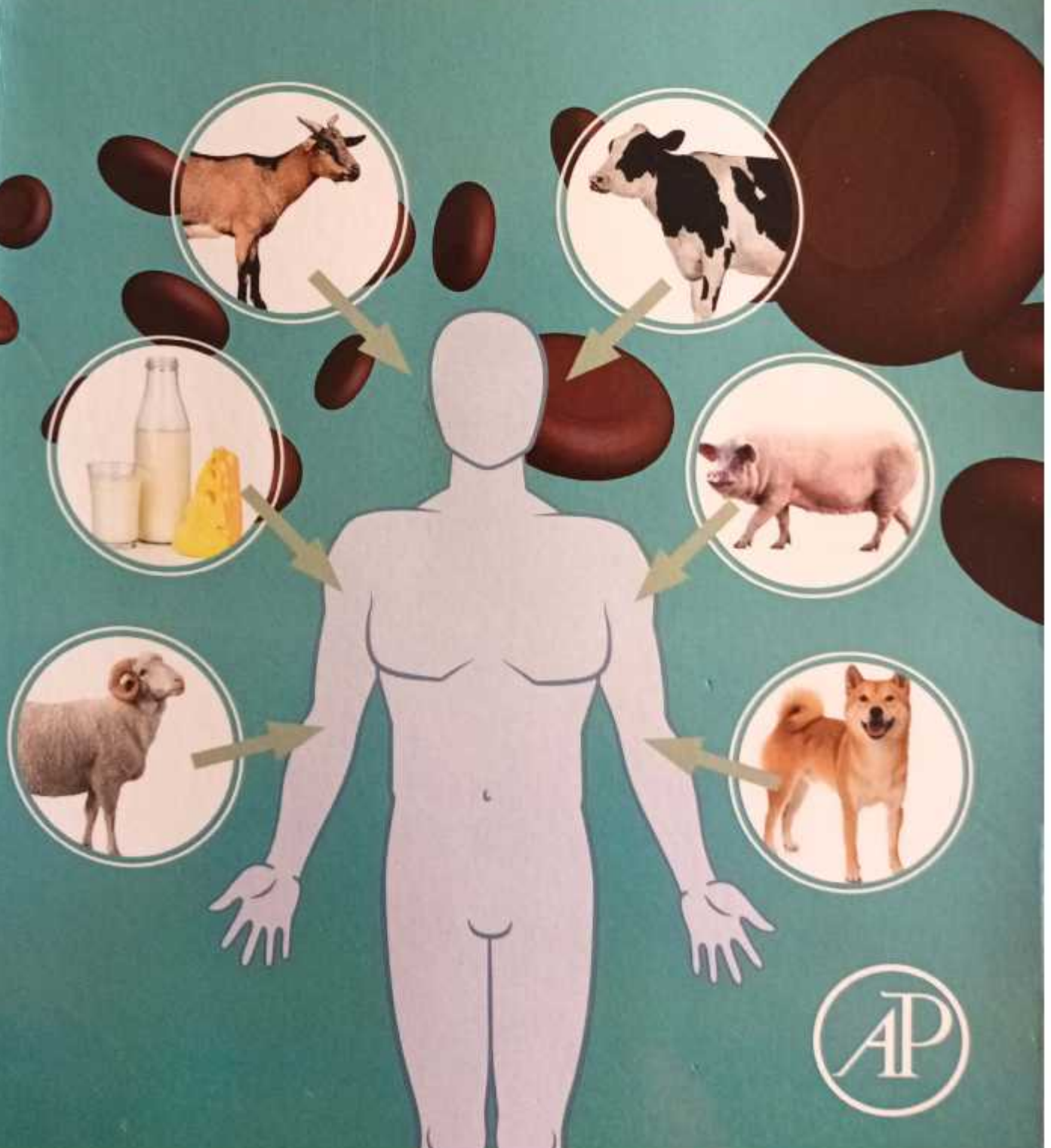


Brucella Melitensis

Identification and Characterization
of Potential Drug Targets

Edited by
Jangampalli Adi Pradeepkiran and S.B. Sainath



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Identification and Characterization of Potential Drug Targets

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Brucella melitensis is a bacteria widely characterized as a biological warfare pathogen. Systems biology and bioinformatics provide new methods and insights into *Brucella* pathogenesis, host–pathogen interactions, and for the rapid development of new potential drug targets. ***Brucella Melitensis: Identification and Characterization of Potential Drug Targets*** presents a systematic approach to identifying and characterizing drug targets using bioinformatics. The book shows the potential of bioinformatic tools in the identification of virulence targets in pathogenic bacteria and viruses in general, and *B. melitensis* 16M in particular. The title first demonstrates the identification of putative genes as potential drug targets, employing a subtractive genomic approach. It considers the virulent genes of this bacteria that negatively affect humans, and lists twelve potential virulence genes as drug targets. Secondly, the title considers the screening of potential drugs against the bacteria's virulence genes, through molecular modeling, computational screening, drug discovery and molecular docking studies. The book demonstrates *in silico* approaches that offer insight into the identification of drug targets in *B. melitensis* 16M.

The title employs a step-by-step approach to identify drug targets, namely: Identifying and characterizing vaccine targets for *Brucella melitensis*; *in silico* screening and identification of novel drug targets from the total *Brucella melitensis* proteome; computational modeling and evaluation of the best potential drug targets through comparative modeling; molecular docking and dynamics simulations of novel drug targets and; *in silico* validation and ADMET analysis for best lead molecules. Researchers will find in this book a focused solution on using bioinformatic tools to find virulence targets.

Key Features

- Covers the identification and characterization of vaccine targets for *Brucella melitensis*
- Presents *in silico* screening and identification of novel drug targets
- Gives computational modelling and evaluation for potential drug targets
- Offers molecular docking and dynamics simulations for novel drug targets
- Details *in silico* validation and ADMET analysis for best lead molecules

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Introduction to brucellosis

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Abbreviations

ADMET Absorption, Distribution, Metabolism, Excretion (Elimination), Toxicity
BvrR *Brucella* virulence related-Regulatory
BvrS *Brucella* virulence related-Sensory
CD Cluster of Differentiation
CMI Cell-mediated immunity
CTL Cytotoxic T Lymphocytes
DNA Deoxyribonucleic acid
IFN Interferon
FAO Food Agricultural Organization
LPS Lipopolysaccharide
logP Partition coefficient
MW Molecular Weight
RB Vaccine against *Brucella abortus* strain RB51
RNA Ribonucleic acid
T-Cells T Lymphocytes
VTRS Variable Tandem Repeats
WHO World Health Organization
% Percentage
μ Micro

1.1 Brucellosis

David Bruce identified the bacterium *Brucella* in the year 1887 and in the year 1918, Alice Evans, an American Microbiologist suggested the term "Brucellosis" to honor David Bruce. Brucellosis is a zoonotic bacterial disease caused by *Brucella spp* and usually transmitted to humans from infected animals. The disease may present clinically as acute, as chronic following an acute attack or

Identification and characterization of vaccine targets for *Brucella melitensis* through in silico approaches

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Abbreviations

BLASTP Basic Local Alignment Search Tool-Proteins
CD-HIT Cluster Database at High Identity with Tolerance
DEG Database of Essential Genes
EC Enzyme Commission
E-value Expected Value
KASS KEGG Automatic Annotation Server
KEGG Kyoto Encyclopedia of Genes and Genomes
KO KEGG Orthology
NCBI National Center for Biotechnology Information
ORF Open Reading Frame

2.1 Introduction to subtractive genomics

The growing number of microbial genome sequencing projects has generated a large number of sequences. To date, sequence information from approximately 400 complete genomes has been deposited into various public domains; completion of the human genome project has revolutionized the field of drug-discovery against threatening human pathogens. These data pose a major challenge in the post-genomic era, i.e. to fully exploit this treasure trove for the

Computational modeling and evaluation of best potential drug targets through comparative modeling

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Abbreviations

BLAST Basic Local Alignment Tool
3D structure Three dimensional structure
LBDD Ligand-based drug design
NMR Nuclear Magnetic Resonance
PDB Protein data bank
PMDB Protein model data base
TBM Template-based protein modeling
SAVES Structural Analysis and Verification Server

3.1 Introduction to protein modeling

The access to experimental structural data of potential drug target proteins in *Brucella melitensis* 16M genomes provides a great deal on judging the structural properties and molecular interaction by X-ray crystallography or NMR spectroscopy is still limited. For X-ray crystallography of these proteins it is rather difficult to obtain crystals, as the structure is dependent on the surrounding, the membrane. Separation of the proteins from the membrane can lead to irreversible structural changes, which inhibit ordered crystallization. Limitations for NMR spectroscopy are the size of the systems, as NMR-spectroscopy can be applied only to smaller protein systems. Protein structure prediction, homology modeling, fold recognition and design, including the prediction and design of

Molecular docking and dynamics simulations of novel drug targets

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Abbreviations

CADD Computer-aided drug design
3-D Three-dimensional structure
 ΔG Gibbs free energy
GUI Graphical User Interface
kcal/Mol kilocalorie per mole
NAD Nicotinamide adenine dinucleotide
NSPD Norspermidine
Rho protein RNA-binding protein
Ala Alanine
Arg Arginine
Asn Asparagine
Asp Aspartic acid
Cys Cysteine
Gln Glutamine
Glu Glutamic acid
Gly Glycine
His Histidine
Ile Isoleucine
Leu Leucine
Lys Lysine
Met Methionine

In silico validation and ADMET analysis for the best lead molecules

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Abbreviations

ADME Absorption, distribution, metabolism and excretion

DNA Deoxyribonucleic acid

FAF-Drugs Free ADME-Tox Filtering Tool

GPCR Human G-protein coupled receptors

HTS High throughput screening

log *P* Partition coefficient

Mipc Molinspiration Property Calculator

mg/L milligrams per L iter

PK parameters Pharmacokinetic parameters

QSAR Quantitative structure activity relationships

RO5 Rule of five

RNA Ribonucleic acid

SMILES Simplified Molecular Input Line Entry System

5.1 Introduction to ADMET analysis

There is no more amazing and complex masterpiece in nature than that of the human body, in which a small chemical entity has to act in a gentle way to cure a specific disease but not to harm in any way. The human body has multiple levels of complexity, since the highly specified machineries -the proteins-work with endogenous, natural compounds that are located in different chemical milieu, regulated in spatial distributions and have time dependent changes regarding their concentrations.

Accordingly, xenobiotic drugs must hit their targets in the appropriate location, and with optimal kinetics. Meanwhile, drugs can interact with

P. B. Kavi Kishor
Manchikatla Venkat Rajam
T. Pullaiah *Editors*

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Genetically Modified Brinjal (*Solanum melongena* L.) and Beyond

C. Kiranmai, T. Pullaiah, and M. V. Rajam

Abstract

Solanum melongena L., commonly called as brinjal/eggplant, occupies an important position in vegetable rearing across the globe and has been regarded as the poor man's crop. The estimated production goes over 52,309,119 metric tonnes annually. Traditional plant breeding techniques have played a vital role in developing new cultivars, thereby improving the overall crop production that catered to the needs of the global requirement. However, in the long run, the requirement has risen enormously due to the rapidly growing population. Simultaneously, the reduction in the yield due to various factors including soil quality, environmental vagaries, diseases and pest attacks posed new challenges in the production-consumption landscape. Of all the factors, the threat of the notorious insect pest, *Leucinodes orbonalis*, commonly known as brinjal shoot and fruit borer (BSFB) which belongs to the phylum Arthropoda and to the order Lepidoptera stood as the greatest challenge to counter as it withstood several broad range insecticides. This situation demanded for BSFB-resistant varieties of brinjal, eventually leading to the development of the genetically modified Bt brinjal. The development of such an insect-resistant variety has been a landmark in brinjal production. The present chapter focuses on transgenic brinjal with improved agronomic traits, particularly insect-resistant Bt varieties, the basic biology of Bt and the major methodologies, the mechanism of action involved in the development of the Bt brinjal.

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Redefining Dalit Women's Empowerment: Socio-Economic and Political Realities in Contemporary India



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CHAPTER-12

PANCHAYATRAJ INSTITUTIONS AND EMPOWERMENT OF DALIT WOMEN IN RURAL INDIA

Bodavula SyamSundar Bhagavan

ABSTRACT:

Achieving the empowerment of Dalit women is one of the progressive reforms brought on by local authorities in India. However, ongoing heterogeneity places our attention on the disproportionate representation of women from diverse cultures and caste classes. Whereas the emancipation of Dalit women (the most marginalised and impoverished segment of Indian society) is an important human rights problem in itself, in the face of a world afflicted by caste politicisation, and facilitates the realisation of a multitude of other associated human rights associated to the same caste community.

Dalit women's democratic voice and decision-making capacity in the fields of basic facilities, economic growth and social justice are crucial factors in questioning and changing systemic caste class segregation towards their substantive inclusion and in allowing them to understand their constitutional rights.

Political involvement in this regard often requires the attention of the state and the increasing role of non-state players in ensuring and respecting equitable political voice and social appreciation for these women. This involves a restructuring in power ties both within the structures in municipal government and within the grassroots social setting. In this regard, the paper argues that India has definitely given ample room for grassroots women's political empowerment through offering a quota concept in the concept of local governance, yet to increase, stabilise and grow on an equitable footing, challenging the fractured Indian social framework, it is important to reevaluate and locate the problem of empowerment of Dalit women through a het.

Keywords: Panchayat, Dalit Women, empowerment, perspectives, liberal, heterogeneity, consequence, societal transformation, constitution.

1.0. INTRODUCTION:

Between human rights in India or elsewhere in the world, the most critical problem is the heterogeneity of problems related to the rights of each and every unique social community in the specific sense of space and time. The human rights tale of Dalit women in India is not that different. As far as the Dalit group is concerned, this group has endured oppression and violence and has left it vulnerable on various fronts: religious, economic and political. While

the tradition of untouchability has been abolished by statute in India, the civility of caste is still a remote illusion and missing from culture, both: dalit men and women and women survive further violence at the end of the day.

In this sense, several timetotime measures have been taken by the government to resolve issues relevant to the oppressed section and, in particular, the Dalit community, including the reservation of women's seats, the Scheduled Tribes (STs) and the Scheduled Castes (SCs) are among the path-breaking initiatives. With many of the renovated and newly introduced features of the Panchayati Raj Institutions (hereinafter the PRIs) following the 73rd Amendment Act, the most ground-breaking in terms of gender equity and the representation of women and the weaker group of women is the allocation of 33 per cent of the seats for women and SCs and STs in relation to their population in the village at all three stages.

When implementing these protections in effect, a new collection of problems has become present and has begun to obstruct the very execution of these protections and to leave the aim partly fulfilled. These problems have become especially burdensome for downtrodden women, such as Dalit's and tribal, to question their involvement in political life. Comparatively, it is more urgent for Dalit community women to face oppression on several fronts: caste, class, and gender. Since the paper deals with the empowerment of Dalit people, it is important to understand why Dalit women need special attention when dealing with their empowerment.

2.0. DALIT WOMEN AND SERIOUS ABUSE:

Dalit women make up a large proportion of the Indian community. As a different social group, it is important to discuss the concerns of this particular social group in the context of unique forms of oppression and abuse. In this sense, the grass-roots PRIs may be seen as an emancipatory phase.

Dalit women may then be elected to a women's seat as well as to a scheduled caste seat. However, the argument is that as the most vulnerable social category in society, a Dalit woman carries the brunt of all three kinds of differences: caste, class, and gender.

A Dalit woman is faced with a particular type of abuse that results in socioeconomic and political insecurity, as a consequence of which she typically loses the effort to hit the forum to contest the elections. In the event that she is elected somehow, she is the target of normal grassroots activities such as sarpanch-pati and panchayat pati, where on behalf of her husband's her husband's serve as a sarpanch or other roles, whatever the case might be. From Ruth Manorama's study on violence against Dalit women in Hague, several instances of violence against Dalit women in rural areas can be addressed here.

Traditionally, these forms of abuse are reserved for Dalit people. This include: intense verbal harassment and sexual epithets, nude procession, dismemberment, forced urine and faeces, branding, teeth removal, tongue and nails, and crime, including murder after witchcraft has been declared. Dalit women are often targeted by rape as part of higher-ranking collective abuse, but Dalit women and girls are also sexually abused and raped within their own groups. The devadasi (or jogini) forced temple prostitution scheme is the most severe type of slavery of Dalit people. Despite its magnitude and frequency, most incidents of violence against Dalit women are not reported. The shortage of law enforcement has left many

Dalit women reluctant to approach the justice system to pursue redress. As women are mostly ignorant of the rules, their confusion is readily abused by their critics, the police and the judiciary. Even after the cases are reported, the absence of due examination or the judge's own case and gender prejudice will contribute to acquittal.

The plight of Dalit women requires specific consideration. Dalit women are one of the biggest socially isolated communities in the world: they make up more than 2% of the world's total population. Three times they are discriminated against: they are poor, they are women, and they are Dalit's. While both Dalit men and women suffer from the same conventional taboos, Dalit women are more frequently faced with these. They are discriminated against not only by people of higher castes, but also in their own families, where men are powerful. As a consequence, Dalit women have less influence within the Dalit movement itself. While they are involved in significant numbers, the majority of leadership roles in organisations, civic bodies, and societies have so far been occupied by men.

Addressing the human rights of Dalit women would strengthen their skills, which would contribute to their complete growth. Democratization of empowerment that is part of collective control is what the quota of women in PRIs is. Studies in various countries of the world have confirmed that, despite the requirements of the affirmative action and the quota rendered to the men and women of the Scheduled Castes, their political status has not reached a degree where they can be assumed to be able to work comparatively separately, as opposed to being able to function independently.

Proxies or orders from powerful persons in the villages In reality, an analysis by Leiten and Srivastava suggests that their Jat respondents in Uttar Pradesh claimed that if the citizens of the Scheduled Castes were pradhans of panchayats, this would lead to a "inversion of the normal social order" The condition of the woman members who are elected presidents by Women's delegates are ill of gender problems and this can be seen in their working as complete members of the panchayats. Dalit women typically controlled my

men from their own kin, from their caste, and from other powerful groups in the villages.

3.0. DALIT WOMEN AND PANCHAYATS:

There is an account of the Dalit women addressed by Professor NirajaGopalJoyal concerning the empowerment of Dalit women through these PRIs. A dalitSarpanch, GundiyabaiAhirwar, of Pipra Village in the Tikamgarh District of Madhya Pradesh lifted the national flag in her village on Independence Day, which was prevented from conducting this ceremonial duty because the majority of Yadav in the village felt that In India, women face the responsibility of landless farm labour, a condition born out of deprivation and hardship. As a consequence, the maximum percentages of female job participation of 45 percent and 38 percent are for advisai and dalit people respectively, as a whole just 30 per cent are incomparable to the above-mentioned percentage. Around the same time, these women are exposed to sexism, harassment, and sexual exploitation by the upper strata and earn less than the legally prescribed salaries. There are gaps in the educational prospects and food consumption of boys and girls in their households.

Whether it is the general command that they are elected to power or their willingness to engage in panchayat decision-making processes, it is no wonder that the condition of the dalits in the panchayats has not been of a higher order. Studies on the various states of the world have shown that Dalits always take orders as representatives from the individuals of the ruling castes and groups, and thus it will not be correct to assume that they have achieved a stage where they can work comparatively independently.

Fair citizenship and political deepening are the primary implications of the freedom to vote. Both the creation of political parties and the electoral mechanism represent the heavy involvement of Dalits in politics and their confidence in democratic structures and processes. Surviving as a confrontation with the colonial and post-colonial states and mainstream political parties is the tale of Dalit's fight for equitable citizenship rights. To be part of the inner true of the Hindu society. What was deemed pure and private by the Hindu political establishment, who stood in direct contrast with the Dalits claim to citizenship?

The devolution of control has generated a major political area that was historically missing. Its implementation has given birth to a new dynamic in the rural policy framework and has given rise to a new revolutionary rural policy. Political empowerment born out of special arrangements for the oppressed sector, such as dalits, adivasis and women, has led to the rise of participatory democracy in rural society, which in turn has led to the empowerment of Dalit women by PRIs.

There are four states that have a 50 per cent reserve for women in PRIs: Bihar, Uttarakhand, Madhya Pradesh, and Himachal Pradesh. The UPA government has also rendered the same law as the 110th amendment and has also approved the bill in line with the requirements of the Standing Committee on Rural Growth. The Bill was first presented in Lok Sabha in November 2009 and followed the committee procedure. Efforts were again made and re-introduced in 2010 in the Lok Sabha after a study had been presented, but sadly it lapsed in 2014 at the end of the 15th Lok Sabha.

In 2016, Birender Singh, Minister of Rural Growth, called for a constitutional change to raise the women's quota in PRIs from 33% to 50%. Some other reforms expressed by the Minister have been to reserve a separate ward for a continuous duration of two terms of five years so that development work can be carried out on a continuous basis⁴⁶ This enhanced room for women in Panchayats can expand the platform for their involvement in a number of ways and capacities.

4.0. NATURE OF WOMEN'S PARTICIPATION:

In order to understand the effect of PRIs on women's empowerment and advancement, it is important to have a prior understanding of how PRIs help empower Dalit women while at the same time promising their advancement and demanding their reserved representation in elected bodies. The deeply stratified rural culture on the lines of caste status and gender indicates that the marginalisation of women is not based exclusively on gender, but rather on the intersection of caste, class and race, and that gender contributes to their inferior role. In the rural Indian sense, however, women are marginalised, in addition to their caste, by class locations. This hinders their engagement, since the higher the stratification of culture, the more levels of women there are. As a consequence of the reservation of seats in PRIs, women will engage in political activities and become elected members of panchayats in different capacities.

The strong presence of informal networks is a central concern in the development of municipal government. These are the typical popular communities that reside in any village. These are the classes that existed and enjoyed supremacy and a voice in decision-making in all matter relating to any issue involving the state. But in situations certain networks often pose problems that are impossible to resolve. Informal organisations are used as a challenge to be mitigated rather than a power to be harnessed. It has been shown that certain organisations are troublesome, since the word governance incorporates organisations rather than mere executives. Therefore, looking at the broader field of governance, including society and the economy, informal institutions and contingent on them shadow institutions, it is necessary to take charge of them, 'latently, if not visibly. These organisations are the cause of injustice in the local rural governance structure. Shadow government networks are not

associated with Raab and Milward's Dark Networks or Cartier-Bresson's Exploitation Networks which are sources to illegal and antisocial activity. Problems such as lack of transparency, lack of faith, arbitrariness, power imbalances, lack of communication, etc. are core concerns that stand in the way of a stable and easy public service delivery system.

Coordination and hence a state of equilibrium are required to be preserved in order to produce better outcomes. The superimposition of political structures and the absence of familiarity with the social condition is a significant explanation for the breakdown of the mechanisms and methodologies involved in the overall establishment of local government in India. Whereas informal local government structures are usually intercaste structures, have "functional support" and "progressive support" as well as "oppressive proprietary characteristics and are not linearly diminishing or decreasing in the face of either modernity in general or increasingly modern elected local councils in particular. Instead, they communicate, sometimes in a constructive way, with these structured, municipal government structures.

5.0. PARTICIPATION AND EMPOWERMENT:

The word empowerment has largely been related to words such as capacity, engagement, and growth where both meanings are interdependent and interconnected. PRIs transparent forums for women to maintain their opinions on decision-making and also allow them to take decisions on the position of women sarpanch. Higher-level engagement by citizens is a medium for transparency and one of the fundamental characteristics of democratic governance. Aware decisions should be taken on subjects of interest to public existence and the facilitation of those decisions should be consulted. Knowledge would allow citizens to make those decisions. Informal citizenship is thus the central democracy, else democracy will not fulfil its function and will exist just theoretically without any realistic applicability. Indeed, the state's funding for welfare and wellbeing programmes may be strengthened and measured by the extent of participation.

Empowerment is a term that originated with the empowerment of women in the 1960s. The word has increasingly been identified with topics such as civil society, association, and organization, and is now at the core of every debate that stresses the involvement of the vulnerable in development. Historically, the idea of empowerment has been examined mainly from two perspectives: first, the person where 'psychological empowerment is studied,' and, secondly, 'individual empowerment.' Knowledge is a catalyst to engaged citizenship and engagement, societal transformation, and lifelong learning. Knowledge is important to help maintain a democratic society.

Feminism, Theology, Freudian Psychology, and the Black Power Revolution, and Gandhism in India, are some of the trends that arose as landmarks of the usage of the word liberation later on. At the expense of redundancy, the word undoubtedly first appeared in the feminist and progressive debates of the 1980s and eventually became used and inspired by the revolutionary vocabulary of International. Empowerment applies to values such as the capacity of people and communities to intervene to maintain their own well-being or the freedom to engage in decision-making that affects them.

With the much praised work of Barbara Solomon, "Black Empowerment: Social Service in the Disadvantaged Groups," which gives way to the use of a phrase restricted to the United States (US) before the 1970s with an emphasis on the vulnerable and marginalised, there was a great deal of presence in study and policy formulation. The word has now acquired enough presence in social care providers and social protest campaigns of various kinds. The past of term empowerment in the construction lexicon has its formal presence in the feminist revolution that started in the global south with the emergence of DAWN (Construction Alternatives with Women for a New Era) established in the city of India in 1984.

Following the row, after the celebrated work, "Empowerment: The Strategy of Alternative Growth" by John Freidman, published in 1992, the emphasis of the idea of Empowerment eventually changed to empowering the disadvantaged. Friedman was the first to change the emphasis of the idea of empowerment to the disadvantaged. Certainly, the word was blamed for its fluidity. However, the word "women empowerment" has traditionally been defined in most policy papers. While used in various ways such as democratisation, decentralisation, the word lacks clear reference and remains loosely defined. Since 1960 to 1980, creation and growth models have been debated and examined for almost two decades. Values such as fairness and democracy have been granted priority in terms of political concerns. And the word empowerment has been established, "Giving control to a certain unprivileged segment of society. The empowerment of Dalit women is a serious problem given the kind of oppression and abuse recorded in different media. The empowerment of Dalit women by PRIs will prove promising and help to control the amount of cases of prejudice and harassment. It was a tragedy that Dalit women were faced with discrepancies from different directions. There is a very small room for Dalit women in the Dalit movement itself, as a consequence of which Dalit women slip into the category of the most marginalised social community.

6.0. CONCLUSION:

However, the PRI idea brought about a progressive change in view of the challenges and concerns connected with the Consumer Panchayats Institutions prior to the entry into force of the 73rd Amendment Act. The essence of Dalit women's engagement is still fractured through various stratification lines in society, and the study needs to be taken to the fore. Dalit women, who are among the most vulnerable groups, need to be researched from various fronts in order to clarify their presence in and impediment to panchayats. As questions of a gross sort when it comes to violence against them, the various forms of ensuring their sufficient representation in these structures of devolution of authority must be streamlined in the form of violence, involvement, and representation and, ultimately, their strong voices discussing their problems must be the elected representatives of the panchayats. More so, when discussing their continuing empowerment to ensure their improved socio-economic and political standing.

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Chapter - 16

Evolution of Sumi as an Independent Self: A Matter of Time

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Abstract

Shashi Deshpande was born into an orthodox family to a renowned Kannada dramatist, writer and Sanskrit scholar, Sriranga, on 19 August, 1938 in Dharwad. Shashi Deshpande depicts her own unique style in her novels written in a simple and clear language with a pleasant literary style, readers are mesmerized towards her novels. Many awards reached her doorstep in her journey as a writer. Women of all kinds are found in the female characters of Deshpande's novels. Those women are so capable of maintaining a clear balance between the age-old customs and their personal requisites that they no longer remain submissive and passive. Her characters are shaped in accordance to her needs. Her versatility to study a female psyche, her marital strains, thoughts and responsibilities clearly depict all those faces of a woman in Deshpande's novels. Her novels have been inspirational and life-enhancing. Nearly all of her novels have dealt with a domestic disharmony, ultimately arriving at a peaceful conclusion in most cases. Never has there been a mention of crude fights between the man and the wife nor has she ever advocated separation from spouse or the family as the only solution to the problems that have arisen. Or has she advocated the success of relationships outside marriage. The value and importance given to the institution of marriage in India is always proven in almost every one of her works.

Keywords: Liberation, freedom, marriage, humiliation, Evolution

Introduction

The novels of Shashi Deshpande advocate the liberation of women from the bigoted social diktas prevailing unfortunately even in the contemporary Indian society. Freedom from dependence syndrome and acquisition of economic independence are considered by her as the major sources capable of imparting autonomy to women over their own lives, thoughts and actions, and thus restoring their true selves.

Shashi Deshpande, who has carved a niche for herself in articulating the bitterness and desolation of her women characters in her novels, enters for the first time into a broader arena and grapples with the complex theme of alienation in her novel, *A Matter of Time* (1996). Also, for the first time in her career, Deshpande makes a man the protagonist of the novel. But this does not mean that the novelist has totally shifted her focus. A close study of the novel reveals that Deshpande is deeply concerned as usual with the traumas suffered by women in a middle-class family in India. No doubt, the novel begins in a manner which is deceptively similar to her earlier novels and follows almost the same pattern, but there is something intrinsically different in its theme and presentation.

Analysis of the novel *A Matter of Time*

A Matter of Time written by Sashi Deshpande is the heart-wrenching story of Sumitra aka Sumi. The story deals with three generations of women – Kalyani, Sumitra and Arundhati – the grandmother, mother and daughter – evolving as mature selves in *A Matter of Time*. Sumi gets married to Gopal, and there to-be blissful happy life begins with an irrevocable condition. Gopal lays a condition that when either of them wished to walk out on their wedding; the other must abide without any fuss. Strongly believing that such a day would never arise, Sumi agrees to his condition. Even after wasting almost two decades of her life trying to sustain her marriage intact, the doomsday arises and Gopal walks out on her when his birth has been questioned at his workplace. It is since then that Sumi begins her trial of establishing her individuality and succeeding in emerging as an independent woman.

In the true sense Sumi is the protagonist of *A Matter of Time*, who fights all odds and ultimately asserts herself to gain independence. Sumi is portrayed as a modern, educated, middle-class woman. She has an independent mind with the power of analyzing and implementing her thoughts. She also possessed a maturity not to overreact. As R.S. Pathak observes, "Deshpande's women characters have strength of their own, and in spite of challenges and hostilities, remain uncrushed". (Pathak, p. 16)

It unravels how Sumi, a deserted wife, is dauntless in her adversity – how she evolves herself from utter desolation and bitterness linked up with invisible chains of patriarchal pressure and other family responsibilities. It records how – with courage, dignity, responsibility and independent spirit, even after desertion by her husband – she has reached a stage of self-sufficiency and self-fulfillment. Sumi lands a job as a school teacher and also tries her hand at penning dramas. After the success of her first drama, which

has been staged by the school kids, she acquires motivation and complete self-esteem that she can, indeed, live up for herself and her daughters.

A woman may get relief from the painful life of a wrong marriage through divorce, but it will not always re-establish her socially, psychologically or financially. Moreover, it can also turn out to be the beginning of another phase of troubles as the divorcee has to further bear the onslaughts of a harsh society which does not allow her to be free and happy. However, luckily for Sumi, she has the full support and sympathy of her parents, sister, cousins and others. This has helped her to a great extent to withstand the shock, pain, humiliation and the trauma of desertion.

Sumi looks for a better job. She learns to drive a scooter. This shows Sumi's will-power, self-confidence and independence, though she appears to be passive and indifferent. She is able to face the challenges of traditional society where women are suppressed for centuries. Betty Freidan has also suggested that women should overcome their femininity in order to establish their individuality. She states in *The Feminine Mystique*:

Now that education, freedom, the right to work on the great human frontiers – all the roads by which men have realized themselves – are open to women, only the shadow of the past enshrined in the mystique of feminine fulfillment keeps women from finding their road (*The Feminine Mystique*, p. 326).

Sumi has an optimistic vision of life. She demonstrates her strength and maturity even in the most adverse situation of her life. She identifies her relation with Gopal in a more mature way. She doesn't care about Gopal's abandonment. For her it is a coincidence to travel with him for a while in her journey of life without thinking about her painful past. As a progressive woman, she can understand the predicament and face the adversities of life without fear. As an educated and modern woman, she never craves for her husband's return. She can now face life with new optimism and renewed confidence.

The nostalgic impact of Gopal on his married life is discussed. The aghast he had felt upon learning that neither his father is really his own father, nor his sister is really his own. His inability to regain composure and overlap any and all of his life situations with his private misery becomes the root cause of all the mishaps. The four generations of women – Manorama, Kalyani, Sumitra, and Arundhati and the extreme mental poise they exhibit is worth praise and is also a learning experience. The mental strength of Kalyani is expressed by the way she deals with Sumi and her three daughters when they reach her place after being deserted by Gopal. Aru's confidence and composure are seen in

her answer to her father after her mother's cremation that she didn't need her father's help and she would support the family in all ways.

This novel is different in theme and presentation from her earlier novels. In this novel, the author makes a successful attempt to present the story from the point of view of her male protagonist, thereby fulfilling her self-confessed desire to write of human beings and not of men or women.

Deshpande has deeply penetrated into the female psyche and realistically projected the tussle between modernity and conventional norms which rages continually in their mind, often generating a sense of guilt in them. In *A Matter of Time*, the novelist portrays that women should overcome the subconscious feelings of guilt in order to assert their individuality and existence as human beings. Elaborating the need to change, she feels that human ideas of right and wrong do change from time to time; ... What was wrong in one age is no longer so in another, what is wrong in one country or culture is right in another.

The novel revolves around an urban, middle-class family of Gopal. It begins with a crisis leading to an intense introspection by the protagonist. However, the first-person narration which served to delve deep into the hearts of the women protagonists in Deshpande's earlier novels, for the first time successfully portraying the inner conflict in a man's mind, though it is sparingly used in parts of the novel. The author who has often provoked a debate about whether or not she is a feminist writer seeks, perhaps, to prove that she is capable of sympathizing with her male protagonists too.

In *A Matter of Time*, Deshpande gives an honest account of the abrupt disintegration of Gopal's happy family and the diverse reactions of all people concerned. The passage from the *Brahad-Aranyaka Upanishad* (11.4.1): 'Maitreyi', said Yagnavalkya, 'verily I am about to go forth from this state [of Householder]' is a fitting epigraph to this novel which deals with a man's mid-life crisis leading to his desire for renunciation. Without any warning, Gopal one day announces to his wife that he is leaving the house for good. Sumi, his wife for twenty years and their teenage daughters, Aru, Charu and Seema are caught totally unawares. Sumi retreats into a shocked silence while eighteen-year-old Aru tries bitterly to search for her own reasons for this calamity.

Deshpande, who was an acknowledged master at expressing the anguish and frustrations of women, gives a true-to-life saga of the trauma faced by Sumi. The support of her immediate family – her parents, sister and cousins – comforts her to some extent, cushioning against the cruelties of life. Unlike the general idea of a deserted wife, Sumi does not crumble to pieces at the pain and humiliation inflicted on her. As soon as she recovers from the shock,

she picks up the threads of her life and tries to readjust her lifestyle to suit the situation. She moves with her children into her parents' house and helps her children to get on with their lives as before. This monstrous tragedy, so undeserving as we are made to understand, leaves Sumi seemingly unperturbed. But beneath her apparent stoicism is a pathos left for the reader to decipher.

Sumi and Gopal's is not the ordinary arranged marriage. Gopal's frequent recapitulations allow the reader to share in their discovery of each other. Their joyous intimacy leaves one in no doubt of their compatibility – physical as well as mental. Recounting the rapture of their first physical union, Gopal thinks: "And I knew then that it was for this, this losing yourself in another human being, that men give up their dreams of freedom" (*A Matter of Time*, p. 223). Their separation, therefore, is all the more poignant. Premi, Sumi's sister, is filled with a rage at the carelessness in throwing away what they had, "uncaring, it seems to her, of the value of what they have discarded" (*A Matter of Time*, p. 136).

It is evident that there are no obvious reasons for Gopal walking out on his family. This is clearly established by the pathetic probing by Kalyani, Sumi's mother, who takes it upon herself to plead with her son-in-law to return home. Gopal reassures her that Sumi is not to be blamed for his decision, but does not offer any other convincing reason. Sumi's sister's attempt to elicit a reply from her brother-in-law also proves to be futile. On probing, Premi discovers from Aru and Charu that their father had been humiliated by his students in the college and had later resigned from his job. However, this does not seem to be a sufficiently concrete reason for his resolution. At times, it appears that even Gopal is not aware of the reasons for this momentous decision he has taken.

Vague references to his past by Gopal reveal that his childhood has not been normal. The fact that his father had married his brother's widow, and he was born of this union proves to be quite unsettling for Gopal. His adolescent mind draws up several possible reasons for this marriage. And, at one time, struggling with an inner conflict, he even draws a parallel from Hamlet's predicament:

It was when I read *Hamlet*, fortunately much later, that the most terrible version of my parents' story entered my mind... In this story my father became a man succumbing to his passion for his brother's wife, the woman compliant, a pregnancy and a child to come (*A Matter of Time*, p. 43).

He is never able to relate to his father always thinking of him as his mother's guilty partner. Later, his parents' gruesome death leaves a void in his

life. But, more than that, it is the realization, that his sister, Sudha, and he did not share the same father, which shatters his equilibrium. As he later reflects: "that was a betrayal that cut away at the foundations of my life" (*A Matter of Time*, p. 52). It is obvious; therefore, that Gopal has long been nurturing a sense of loneliness and desolation as is evident from his ruminations:

Emptiness, I realized then, is always waiting for us... And so it's a lie, it means nothing, it's just deceiving ourselves when we say we are not alone... All human ties are only a masquerade. Someday, some time, the pretense fails us and we have to face the truth (*A Matter of Time*, p. 52).

This line of thinking, which is similar to Sartrean existentialism, progresses towards the more Indianised concept of renunciation in the later stages of Gopal's life. The Hindu tradition identifies four stages in a man's life: *Brahmacharya*, *Grihasta*, *Vanaprasta*, *Sanyasa*. Having experienced *Brahmacharya* and *Grihasta* (bachelorhood and the duties of a householder), respectively, Gopal now moves to experiencing *Vanaprasta* (the relinquishing of the duties of a householder) which is only a step away from *Sanyasa* (total renunciation).

For Deshpande's Gopal, however, the dilemma continues and his desertion upsets a number of peripheral characters, apart from the significant character of his wife, Sumi, which again compels the author to stray back into her forte of giving voice to the discontent and frustration of women. Sumi copes quite admirably with the humiliation and disgrace of being a deserted wife. She does not rave and rant but surrounds herself with a deathlike silence. Simone de Beauvoir has sympathetically presented the isolated subjugation of housewives:

Thus, woman's work within the home gives her no autonomy; it is not directly useful to society [...] far from being the matron, her occupation makes her dependent on her husband and children However, respected she may be, she is subordinate, secondary, parasitic... the very meaning of her life is not in her hands (*The Second Sex*, p. 175).

Her very silence, however, conveys her pain more effectively than words can. In a manner quite similar to that of her counterparts, Indu, Saru, Jaya and Urmi, in Deshpande's earlier novels, Sumi reveals an independent nature. She refuses to accept financial help from her well-placed parents, her doctor sister or Gopal's ever-helpful doctor nephew, Ramesh.

She insists on taking up a temporary teaching post at once and is actively on the lookout for a permanent job. With great determination, she learns to

ride a two-wheeler, at her age, much to the amusement of her children and the anxiety of her mother. She frantically searches for a house to move into, unwilling to stay on in her parents' house, but gives up only when she is convinced of the impracticality of moving out of the 'big-house' which had ample space for her family into an expensive and congested apartment. She gently spurns the efforts made by her friend and cousin, Devaki. She also makes it a point to inform Gopal that she has in no way encouraged their daughter, Aru, who is obsessed with the idea of suing her father for maintenance. Her pride refuses to allow her to show her grief to Gopal or request him to return home.

Sumi continues her life and unleashes her psyche from the dogma of possessing a sheltering tree, i.e., a husband. She has an independent mind with the power of analyzing and implementing her thoughts. She also possessed a maturity not to overreact. Sumi's daughter, Charu is hopeful that one day her father would return and everything will become normal. She asks Sumi whether she will accept Gopal and forgive his faults. Sumi has assessed the situation in a more practical manner, and responds accordingly:

High and mighty? No I can never be that. But taking him back. I don't know, Charu that sounds odd to me. As if he's a pet dog who's strayed away or something. No Charu, I am not a good hater, I can never keep it up for long. But even if he comes back, things can never be the way they are, you know that, don't you? (*A Matter of Time*, p. 194).

Sumi does not lament her lonely state. Her only wish to buy a house for her daughters does not materialize due to her limited income. Sudha's son, Ramesh extends his financial help to Sumi, which according to him, is her right and not a charity done to her. Sumi again rationally analyzes her position:

You know Ramesh, I've begun to think that what Gopal has really done is not to take sanyas. I'm surprised none of you have thought of that. But look what's happened. It's not he who is going around with the begging bowl, it's I who am doing it. (*A Matter of Time*, p. 123).

Sumi is made to suffer the disapproving comments of women like Shankar's mother:

"When are you going back to your husband?" the old woman asks abruptly. "You should be with him... It's all right to stay with your parents for a while, but that's not your home... Go back to your husband, he's a good man. If you've done wrong, he'll forgive you. And if he has - women shouldn't have pride" (*A Matter of Time*, p. 161).

Conclusion

Deshpande advocates total independence for women – an independence which should pervade their thoughts, expressions and actions. Relationships define womanhood and it is within this frame that the whole network of their world has been woven. Deshpande's female protagonists do not want to transcend or negate these bonds, they want their existence to be identified and respected by their male counterparts. *A Matter of Time* assertively speaks about the independence of women and the acknowledgement of their rights. It also depicts that the man-woman relationship can be restored to the axis of equal dignity only through the dilution of ego and mutual understanding of each other's needs. Thus, Deshpande breaks herself free from the cordon she had earlier built around herself and successfully articulates the doubts and fears of her men characters with the effortless ease she had hitherto written about her women protagonists. In an interview, she expressed her desire "to reach a stage where I can write about human beings and not about men or women" (Interview with Vanamala Viswanath).

A close study of the novel reveals that it raises many issues about marriage. This analysis of the institution of marriage in the novel provides useful insights into Deshpande's art and fiction. Here, the theme of marriage is explored in its different forms and complexities along with the changing socio-cultural milieu. One important aspect dealt in the novel is the exploration of male psyche. Male characters are also dealt in full length and shown in positive light.

A Matter of Time is the first of Deshpande's novels to be published abroad. The theme of the novel as well as its content, the outlook of the writer and the place it got published, all reflect the change in the perspective of the writer. Modernity, emancipation, novelty in thought, theme and expression, all go in to form the crux of the novel, *A Matter of Time*. In an interview given to Satnley Carratho published in *The Sunday Observer*, Deshpande states:

"The way I see my own work is that with *That Long Silence* I came to the end of one stage, *The Binding Vine* was a kind of trying to move on to another part. And with *A Matter of Time* I moved with greater certainty into a new area: I was trying to get a wider perspective, more outwardness and less introspection" (*Caste as Woman*, p. 25).

A Matter of Time is the novel of love and loss of human emotions and the fall and rise of human personality. She dies with Shripati in an accident just when she was on the brink of starting a new life with her own efforts. Deshpande states about the unhappy conclusion in an interview to Vimala Rama Rao:

So was I unhappy over Sumi's death, but it just happened; it was not deliberate. Sumi, without her husband, the economic part would be most important. Money is very important to me like Jane Austen (*The Journal of Indian Writing in English*, p. 257).

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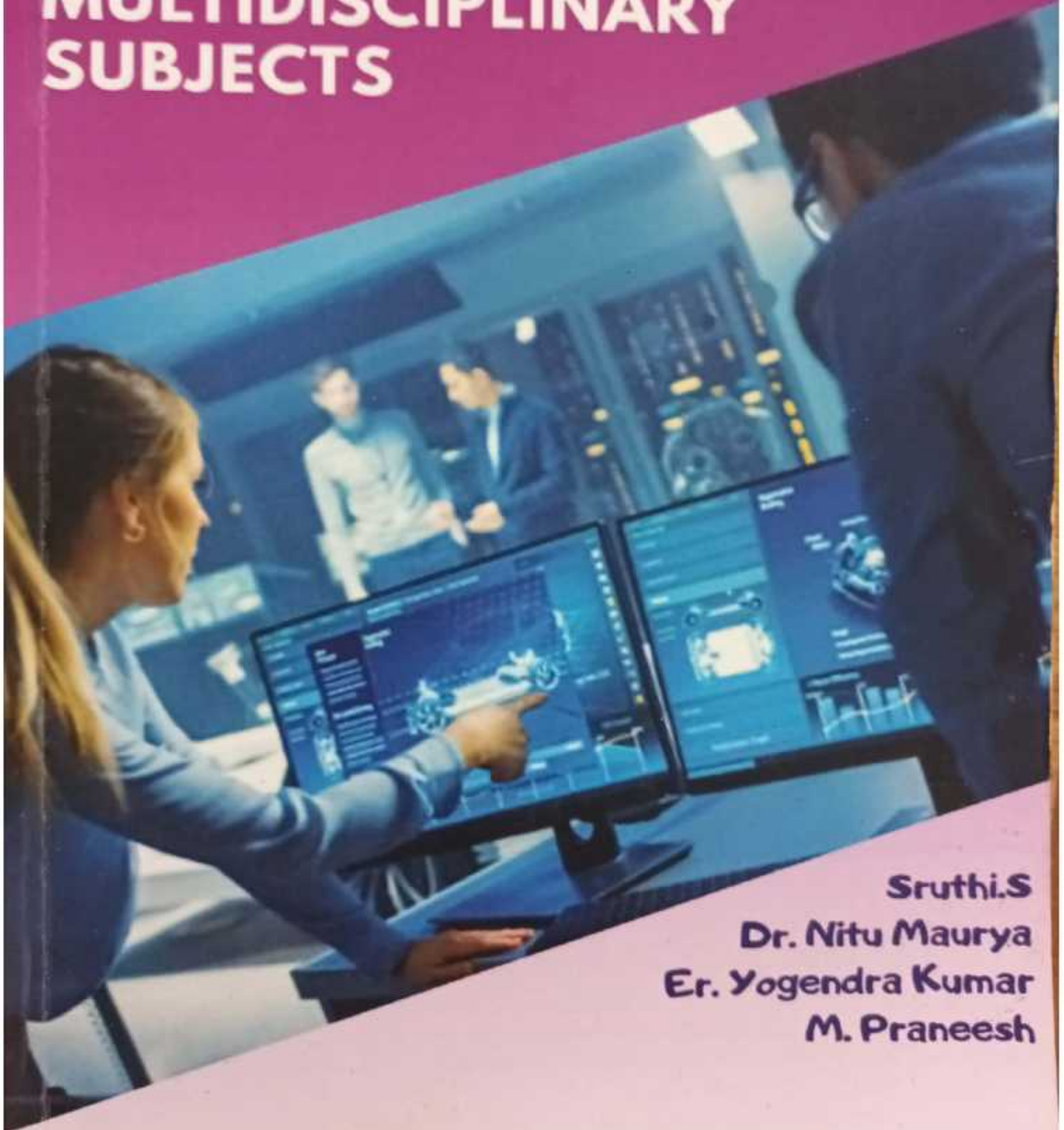
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A THRONG OF GULLIBLE CHARACTERS IN *MIGUEL STREET* OF V.S. NAIPAUL: A STUDY

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ABSTRACT

V.S. Naipaul, as a historian, short story and fiction writer, is a very distinguished writer among the postcolonial writers. His place as a writer is unforgettable that influenced the Caribbean readers and the readers all over the world with his splendid themes of social relevance and new way of narration. His transformation from a son of an unsuccessful Trinidadian to the heights of winning the Nobel Prize for literature is a virtual pilgrimage of post-colonial success. V.S. Naipaul, in his writings, quests his own position in the world. *Miguel Street* is considered to be the contribution of a young Naipaul to the Trinidad where he is brought up left behind in 1950. The tone of the *Miguel Street* is apparently nostalgic. As a precocious and enthusiastic observer of his colonial Trinidad, he narrates seventeen stories in *Miguel Street* with a naked innocence accepting the values and vulnerability of the street. All the stories in *Miguel Street* explore and expose gullibility of the West Indian society and its inhabitants who escape from reality to fantasy and who are carried out by eccentricity, ambition, and romanticism. Naipaul asserts that *Miguel Street* is the first serious writing in which he tries to discover 'the trick of writing'. The inhabitants of the Miguel Street form the 'rubbish heap' of the West Indian society. Naipaul with his sarcastic tone in all the stories seems to have denounced the culture, habits, and values of West Indian Society. There are no laws of the land, no moral and ethical conventions to order the disordered lives of the inhabitants. Miguel Street is fully replete with mere anarchy. There is no particular culture to bind them and they have no ambitions to achieve. These inhabitants are outcasts, prostitutes, and knaves. This research paper aims to study the gullible characters portrayed by V.S. Naipaul in *Miguel Street*.

Keywords: Gullible, Vulnerable, Imitation, Inhabitants, Rubbish-heap, Picaro.

INTRODUCTION

Vidiadhar Surajprasad Naipaul, popularly recognized as V.S. Naipaul, was born in 1932 in Trinidad in Hindu family. His fiction and non-fiction have brought him honours and accolade including Nobel Prize for Literature in 2001, in addition to many literary honours in his life as a distinguished writer. V.S. Naipaul, as a historian, short story and fiction writer, is a very distinguished writer among the postcolonial writers. His place as a writer is unforgettable that influenced the Caribbean readers and the readers all over the world with his splendid themes of social relevance and new way of narration. His transformation from a son of an unsuccessful Trinidadian to the heights of winning the Nobel Prize for literature is a virtual pilgrimage of post-colonial success. V.S. Naipaul, in his writings, quests his own position in the world. The unique circumstances relate him to three societies - Caribbean, the India, and the English - and left him with a sense of homelessness. V.S. Naipaul writes with an autobiographical element in his works. As Bruce King opines, "While the novels and short stories have seldom been about himself, they have reflected the various stages of his disillusionment with Trinidad, his despair with India and his concern with being a homeless ex-colonial" (p. 108).

Therefore, it can be estimated that his shorter fiction also contributes to his ordering of experience and his status of being a "perplexed exile". The Shorter Fiction is also an evidence for V.S. Naipaul's chronicling of personal experience. In his shorter fiction, he attempts to give expression to the themes of identity crisis and restlessness. In his Shorter Fiction, the narrative technique is rich with irony and satire. He has taken the Western traditional form of shorter fiction, but blends it with his own cultural experience of the East Indian community in Trinidad. His early fiction portrays the cultural confusion, homelessness, and characters fighting to retain their dignity. In this paper I have made an attempt to expose the worthless struggle of the characters in *Miguel Street* caught in the web of uncertainty with reference to socio-cultural and ethnic forces of heterogeneous Caribbean society, for the survival.

ANALYSIS OF MIGUEL STREET

Miguel Street is considered to be the contribution of a young Naipaul to the Trinidad where he is brought up left behind in 1950. The tone of the *Miguel Street* is apparently nostalgic. As a precocious and enthusiastic observer of his colonial Trinidad, he narrates seventeen stories in *Miguel Street* with a naked innocence accepting the values and vulnerability of the street. All the stories in *Miguel Street* explore and expose gullibility of the West Indian society and its inhabitants who escape from reality to fantasy and who are carried out by eccentricity, ambition, and romanticism. Naipaul asserts that *Miguel Street* is the first serious writing in which he tries to discover 'the trick of writing'. He says in an interview with David Bates,

"I remember, late one afternoon, putting in a bit of paper, setting it at single space and without pausing writing the first story of *Miguel Street*".

In *Miguel Street*, V. S. Naipaul tries to say something different from what his father said in his stories. He has not only attempted to portray the reality of life but also the pattern that controls them. *Miguel Street* is a conglomeration of varied kinds of people who are chosen by the place of living rather people choosing it themselves. It portrays the uncertainties of the West Indian Society in which the inhabitants try to get away. The uncertainty and instability is the result of very stability of varied subcultures that constitute the strange soup-mix recipe of this society. The physical layout of the *Miguel Street* confirms it as the perfect ecological metaphor of the human situation. The seventeen stories of the *Miguel Street* are titled after the individuals of the street. Every character is interconnected to the other characters. As Francis Wyndham says:

"The street is in Port of Spain, and Mr. Naipaul takes us from house to house connection on a character here, a situation there, before moving on the next: a major figure in one episode may fill a subsidiary role in another" (78-79).

Miguel Street is replete with lethargic, hopeless, and traditionless individuals in which imitation happens to be the order of the society. The book portrays a society devoid of any glorious past or noteworthy future. The inhabitants of the *Miguel Street* are neither model nor ideal, they are aware of their own inability and hopelessness in the society. The narrator of the *Miguel Street* feels: "I used to wonder whether they knew how much worry they caused, and how uncertain their own position was." (*Miguel Street*. 129).

They have no rich social or moral background. They do not have rich inheritance to dream about nor notable history to boast of. As Walsh says, "This is the life without natural graces, heroes, saints, without a national identity of social purpose, inherited by the people of *Miguel Street*". (30).

All the characters in *Miguel Street* are neither clever nor foolish. Disorder has become the order pertaining to the characters of Miguel Street. Every character faces an uncertainty and pretends to be doing something, but never achieves anything in pretending and doing so. It is very ironical and great surprise to the narrator that no one starves though they are jobless and they earn no money. Miguel Street appears to be a slum for strangers, but to the individuals of the street it is a world by itself. There are copious and varied kinds of character though each character is different from the other. "Man-man was mad; George was stupid; Big Foot was a bully; Hat was an adventurer; Popo was a philosopher; and Morgan was our comedian" (*Miguel Street*, 61)

The character of Bogart is the first one that has been introduced by Naipaul. Bogart's living has been surrounded by mystery. He pretends to be making a living by tailoring, but he does not have the skill of stitching. He is akin to Popo, the inhabitant of Miguel Street, who lives next door. Bogart established his false identity for himself and he never reveals own story. These characters are neither idle nor ideal.

Popo, the carpenter, acts to be working on a thing without name, but never succeeds in making a stick of furniture: "And yet Popo was never idle. He was always busy hammering and sawing and planning". (*Miguel Street*, 8). The Street looks down Popo, and his wife also ignores Popo's poetic sensibility, as poetic sensibility has no room in Miguel Street. The typical quality of the street is that Popo beats his wife's lover after drinking alcohol and goes to the Court of law for trial. A prison sentence for robbery grants him the necessary recognition. Then only the inhabitants of the street accepted him as inhabitant of street. Notoriety is the peculiar quality that brings popularity to the inhabitants of the street.

Man-man competes in each and every election and get only three votes every time, one of the votes being that of his own. "He never worked, but he was never idle. He was hypnotized by the word; particularly the written word and he would spend a whole day writing a single word". (*Miguel Street*, 34). He claims himself that he is the new Messiah, which throws him into problems. Madness is accepted by the street, but not the fanaticism. He accepts to be crucified on the cross and kindles the inhabitants to stone him. He prays, "Father, forgive them. They don't know what they doing". Then he yells out 'stone me brethren!' (*Miguel Street*, 39).

George is a drunkard and frequently creates nuisance in the street with his rude behaviour. He maltreats his children and wife. He kills his own wife to remarry again and moves with stray women. His son Elias and daughter Dolly do not perform funeral to him after his death, but inhabitants of the street donate money to bury his dead body.

B. Wordsworth falsely claims himself as a popular poet, but he never completes a poem. Once the narrator of the story asked him to recite, but B. Wordsworth fails to recite a poem and escapes from the scene. Big Foot is considered to be a terror in the street, but fears to a small barking dog. He worked as driver, postman, carpenter, and mason, but in all the jobs he proves to be good for nothing. He proclaims himself as a great boxer, later he becomes a jester in the street when R.A.F. man defeats him. Finally, he settles as a labourer.

Morgan is a pyrotechnicist, but he proves himself good for nothing. He is like a jester and comedian in the street. He has frequent quarrels with Mr. and Mrs. Bhakcu and he has no cordial relationship with his children. He proves his silly nature by beating his children very badly.

Mr. Bhakcu, another strange character, claims himself a mechanical expert but he never skilfully repairs even his own vehicle. He purchases a Bedford lorry, and two taxis, but he is unable to earn money. Finally we see him as Pundit.

The character of Laura, who resides next door to the precocious narrator, is a sensation in the *Miguel Street*. Bogart is a boring person in the street, but Laura is very vivacious. She is not beautiful, but she has seven husbands. This sort of typical raising and flattening for months regularly. The narrators observes that her belly cycle around her house whistling for Laura.

Eddoes hails from aristocratic family, who works only in the morning and he is keen on women and begets a child "Pleasure". He also involves in amorous and illicit relation which signifies that aristocratic people also have extra-marital relations with the common people in the street. Bolo, Missing Ball, is a tall man with a face of sad caricature. He acts as pedlar and barber. Finding the missing ball is his passion. He gets irritated and gets angry for not finding the missing ball to earn money in an easy way.

Hat is a notable inhabitant in the Miguel Street. The residents give much respect and importance to him. Each and every character is linked with character of Hat. He is always involved in troubles with police. He has a kind heart which enables him to collect money to bury the dead body of George. He brings home George's daughter Dolly, and his wife. Later, he kills her for which he put in jail for four years.

Bogart is an unsuccessful tailor, and Popo is an unsuccessful carpenter. Big Foot is treated as a terrifying man, but he proves himself as a coward, who is afraid of a small dog. Mr. Morgan is fails in his fireworks. To the surprise, Laura gives birth to eight children by seven husbands. Laura's daughter Lora also follows the footprints of her mother and gives a birth to a child without getting married. Edward assassinates his wife and spends in prison. The marital relation between Tony and Mrs. Hereina is not peaceful. Finally, Hereina rejects Tony as her husband.

In the last story, "How I Left Miguel Street", reveals the narrator as a failure. Therefore, he escapes from the Miguel Street to London by securing a scholarship donated by Mr. Ganesh Ramsumair. The narrator also accepts that he has habit of drinking rum, smoking cigarettes, and involved in amorous deeds. "For sustaining ironic qualification, in which, the narrator of the story is himself a participant in it but, although he may be neither foolish nor demented, nevertheless manifests a failure of insight, viewing and appraising his own motives and actions of other characters through the distorting perspective of his prejudices and private interests".

The inhabitants of the Miguel Street form the 'rubbish heap' of the West Indian society. Naipaul with his sarcastic tone in all the stories seems to have denounced the culture, habits, and values of West Indian Society. There are no laws of the land, no moral and ethical conventions to order the disordered lives of the inhabitants. Miguel Street is fully replete with mere anarchy. There is no particular culture to bind them and they have no ambitions to achieve. These inhabitants are outcastes, prostitutes, and knaves. "These Trinidad people does only lie, lie. Lie is all they know". (*Miguel Street* 143). Every character begins and ends up as an utter failure. Only the narrator runs away from a life which was nightmarish. As Keith Garebian observes, "Life on the street is a microcosm of dispiriting failure, so he leaves it all in a mood of exultant relief". (p. 25).

The characters of the street are very different in their own way, but, by the sense of place, they are interconnected and unified. They appear and disappear. They appear only to disappear. They are wanderers, and Picaros. As Walsh opines, "They appear and disappear like fish or bird". (66).

The lay-out of the Miguel Street appears to be slums for the strangers, but it is the world in itself to the inhabitants of the street. "The inhabitants of the street have neither respect nor grace for decent living". (*Miguel Street*, 66). Amorous and extra-marital affairs are very common in the street. Bogart is proved to be a smuggler and leads an illegitimate life. In his absence, his house is full of stray women and licentious people. Bogart runs a brothel house in George Town. Popo's wife elopes with a gardener. Popo, like Morgan, fights with his wife doubting the paternity of his children. Edward's wife elopes with an American soldier. Hat's wife also elopes with another man. Treachery is the primordial quality of the inhabitants of the street. The narrator of the story is not exceptional. At the tender age of 18, he maintains relation with stray women. The narrator asserts himself in the final story, "How I Left Miguel Street", "We made wild parties and took rum and women to Maracas Bay for all-night sessions" (*Miguel Street*, 174). Wives beating husbands and husbands beating wives is a common quality in the street. As William Wash observes, "If it is, even brutality, even the beating of wives and children, is tolerable". (11). George punishes his children and wife. Morgan beats his children very cruelly. All the inhabitants of the street laugh at Mr. Morgan when Mrs. Morgan holds his by his waist. It is noticed that Nathaniel often beats his wife, Laura. Later it is noticed that Nathaniel is beaten by Laura. The narrator says, "All the time he had the story, he hated his wife, and he beats her regularly with the cricket bat. But she was beating his too, with her tongue". (*Miguel Street*, 128).

In *Miguel Street*, K.I. Madhusudhana Rao comments that "Even God seems to have been comfortably domesticated". (p. 29) Man-man claims that he sees God and there is no need to get surprised because seeing God is common quality as Ganesh, the mystic, has set a trend.

CONCLUSION

V.S. Naipaul has portrayed the ironical view of life. The street is conglomeration of varied religions, sects, and races, which is the fundamental basis of West Indian life. Mystery prevails in each and every character in the street. All the characters are gullible and vulnerable. They are neither good nor try to mend their follies by growing out of their innocence. They allow themselves to face the sufferings out of their ignorance. *Miguel Street* is the first work of V.S. Naipaul from which he acquired the trick of writing with care objectivity.

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Chapter - 13

The Emancipated Protagonist in *The Binding Vine* of Shashi Deshpande: A Study

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Abstract

Deshpande is a well-known and prolific writer who explores the pains and pangs and predicaments of women and loss of their identity in the male dominated society. She has portrayed women questing for their identity and selfhood. Whereas her couple of earlier novels portrayed women protagonists with a cloistered self, who are unable to overcome, break and resist the so called socio patriarchal shackles of domination. But in her next couple of fictional works, *The Binding Vine* (1993) and *A Matter of Time* (1996), female protagonists are portrayed with a new rejuvenated spirit who resist and break the mute suffering. This paper aims at liberation of Deshpande's women characters from silence suffering to resistance. However, the protagonists in this novel, akin to her previous novels, are bold women who speak out boldly against the false attitude of the patriarchal society. The major character in *The Binding Vine* is completely different from Shashi Deshpande's earlier protagonists. Being educated women, she realizes the constraints imposed by the tradition, the meaninglessness life of modern women in the male chauvinistic society. Urmila, the protagonist of the novel, liberates herself from the shackles of tradition and gives her voice to the voiceless.

Keywords: Identity, patriarchal society, cloistered self, traditional women, suffering.

Shashi Deshpande is a renowned and widely read Indian woman writer. Deshpande in her various works portrayed the lives of modern middleclass women. The great novelist questioned the male chauvinistic domination in Indian society. She discussed the plight of women in the oppressed, frustrated and shackled identity in the male dominated society.

The novelist attempted to present the transformation of men and women characters from the submissive nature to the self-recognition. In her novels like *That Long Silence* and *The Dark Holds No Terror*, she depicted the female characters as submissive but her next couple of novels, *The Binding Vine*, and *A Matter of Time* portray women as progressive, protective and lovers of egalitarian society.

This paper attempts to analyze Shashi Deshpande's novel *The Binding Vine*. Unlike the early novels of Shashi Deshpande, the novels published in the second phase could not attract the attention of readers and critics. *The Binding Vine* also deals with feminine issues and the novelist not only has portrayed the traditional women characters but also how the educated middleclass women have raised their voice at times. The writer successfully represented the modern women's quest for identity, self-respect and independence. Major characters of Shashi Deshpande constantly search for definition of self and society and importance of their role as a woman in the society. The fictional world of Deshpande reflects the vision of contemporary progressive women and how they are liberated breaking the shackles of the tradition in order to prove their ability and to achieve their empowerment. In *The Binding Vine*, the novelist clearly presented the positive and progressive attitude of educated middle class women and depicted their fight against the male chauvinistic society.

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quo". Having borne the loss of her one-year daughter-Aru, she is able to understand and relate to the silent sufferings of other women like Vaana, Mira, Shakutai, Akka and Sulu who act in complexity with the status quo. The novel depicts a society where women are emotionally powerful, professionally skillful to handle the circumstances that challenge their lives. *The Binding Vine* is the story of women those who conquered their surroundings, defeated the pain and who excelled in the art of living. The protagonist of the novel Urmila observes that the live is only the force that can bring all the suffering hearts together and that teaches the art of living thereby transforms the earth into heaven. She invites all men and women to march forward jointly since "a new road, a new way a new age". Realizing the law of compensation that determines one's life expands human intellect and leads to success in one's life.

The love is a major theme in the novel *The Binding Vine*, the protagonist Urmila goes for a love marriage. The protagonist has great respect for love and faith in its power, but she believes that such a love is absent in her married life. For Kishore, sex is the solution to her problems, but for Urmila emotional bonding is more important. Urmila's experiences taught her that she cannot unveil Kishore's disposition of indifference. "Kishore cannot remove his armour; there is something in him I will never reach" (141). Deshpande focuses on the colonial brought up of a girl child in the male dominated society where she is subjected to subjugation and oppression right from the beginning of her childhood. In order to make the girl child ready for marriage, the mother prepares her for household job. Parvati Bhatnagar in her article *Go Home like a Good Girl: An Interpretation of That Long Silence* observes, "The tale of girls belonging to middle class is different. They are sent to school and college and required to help senior ladies of the family in the kitchen and other household work in their free time more as a part of their training" (136).

In the novel, Vaana is an educated working woman but never dares to question her husband's supremacy. This outdated and obsolete distribution of responsibilities between male and female is no more acceptable to modern women. But woman's entry into new areas of commercial market has multiplied her problems. She doesn't get any help from her male counterpart in the novel, Harish does not care of his household duties and moreover he seems to be unsympathetic towards his wife. Akka is another victim of patriarchal system. She was afraid of marrying of Kishore's father because she has crossed the marriageable age. Sulu is always feared that her husband might expel her out of the house as she failed to give him a child. She finds it

a grave shortcoming on her part and a continuous complex of perplex in her life: "After marriage she changed. She was frightened, always frightened. What if he doesn't like this, what if he wants that, what if he is angry with me, what if he throws me out? (195). Here Deshpande highlighted the loopholes of Indian institution of marriage and she exposed how it demoralized the vivacious girl and turned her into a fearful and nervous human being.

Shakutai, unlike her sister Sulu, hesitates to continue the meaningless marital relation and to be a better half of good-for-nothing husband. Meanwhile, she knows the fact that it is not a cakewalk for a woman to get out of marital relation. Thus, Shashi Deshpande clearly exposes how the institution of marriage suppressed women, how it imposes implacable pain upon married woman and makes life miserable. However, irrespective of their professions or domestic lives every woman considers marriage as a trap from which they cannot escape from their life time. But the Shashi Deshpande's protagonists' greatness is that they never attempt to break their marital relationship.

The strained relationship and lack of mutual understanding between wife and husband obviously affects the mother daughter relationship. It is evident that Shashi Deshpande's heroines seem to have hostility towards mothers. *The Binding Vine* mirrors the mother-daughter strained relationship through the examples of Urmila's mother – Mira, Shakutai – Kalpana, Akka – Vaana and Vaana – Mandira. No pair mentioned here enjoyed the harmonious relation that gratifies their mental and emotional needs. Deshpande beautifully depicted the bitter reality of male dominated society where woman ratifies to the traditional values for their survival. The traditional and conservative women believe it is necessary to oblige the social norms to make their life meaningful and successful. The woman became preservers of these social norms which they consider as ideals, and these mothers inject the values in their daughters. As Simon de Beauvoir points out: with

Most women simultaneously demand and detest their feminine condition; they live it through in a state of resentment-vexed at having produced a woman. She hopes to compensate for her inferiority by making a superior creature out of one whom she regards her double... Sometimes, she tries to impose on the child exactly her own fate: what was good enough for me is good enough for you, I was brought up this way, you shall share malot. (533-34).

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The separation between Urmi's and her mother result in Urmi's anger on her mother. Though the dominating nature of Urmi's father caused the separation between mother-daughter but it was the mother of Urmi who had to experience the rage and wrath of her daughter. Vaana and Mandira couldn't enjoy harmonious relation due to their dual role in their lives. "I don't want Hirabai, I want my mother" (72). But the most precious and pious bond between mother and daughter, cupped with tensions and complications is the one between Kalpana and Shakutai. Shakutai's estrangement with Kalpana starts even before her birth. As she accepts before Urmi, "I didn't want the child. I didn't want Kalpana. In wanted her to die". So, the forced motherhood brings out more burden than the emotional fulfilment. Kalpana's carefree outlook filled her with a kind of fear when she says, "If you pant and flaunt yourself, do you think they will leave you alone?" (146). Kalpana holds her mother responsible for her desertion (Shakutai) by her father. She said, "You're always angry, always quarrelling, that's why he's gone" (93).

This determined attitude of Kalpana towards mother and also she hesitated to share anything with her mother. Shakutai fails to read the heart of her daughter who wants to lead an independent and carefree life which her mother and aunt never experienced. The mother in the novel symbolizes tradition and the male domination determined their attitude. This male domination and social norms caused the strained relations between mothers and daughters in the novel. Rousseau's statement that "Man is in chains everywhere" is apt in the context of woman as well. No traditional value protects women from sexual violation or any physical abuse. The purity and chastity of her body is damaged through unavoidable physical relation. Frank Hosken opines that cruelty against female is perpetrated "with an astonishing consensus among the men in the world "Every married man strongly believes that he has every right on the soul and body of his wife and thinks that the body of his wife is his property. Committing sexual abuse on one's wife is also a criminal act but, in our society, no one considers it as crime. Deshpande is brave enough to deal with such subject in her novel. In her earlier novel *The Dark Holds No Terrors*, she talked about the issue of 'marital rape' and in this novel she confirms that rape is not only mere a social sin but a 'psychological perversion stemming from desire to overpower the self and identity of woman'.

In India, an overall continuum of silence seems to pervade this issue, which if at all is discussed in Indian milieu, is done in whispers and subdued tones. But one should always remember that if words have consequences then silence too. Silence speaks a lot; it means a lot but no one knows about

this except the person who is silent. Similarly, in this novel Urmi is voicing not only her own despairs and frustrations but those of each and every woman who is a victim of this male-driven world and is not allowed to think herself as an entity. Imtiaz Dharker in her poem, "Sacrifice" emphasizes that society and tradition weigh to heavily on a woman's consciousness that fear along can sum up her situation. Traditionally, women are seen as 'belonging to men like their property'. In this context Bhattacharya Benarjee opines:

Herself a piece of commodity she could not give gifts but could be given in sacrifice, always lost and won in chess, bought or sold as goods. She had no right to property; none over her own body-she was a man's absolute possession" (32).

So, the binaries of male/female, man/woman, powerful/powerless are central to the issue of rape. Moreover, the fear of rape curtails a woman's freedom, confining her to mere a scapegoat of 'seemingly happy homes' in India, since "Rape is dishonour, a shameful thing for a woman. It is a crime where the victim faces "dejection (of both society and her family) (Premilatha 23).

The suffering of Mira, for Urmi, is similar to an innocent goat waiting to be killed by her tender age of 18, though she desires to educate herself further and improve her poetic skill. But the manipulative behaviour of her husband succeeds in getting her as his wife. He is interested in her body and unable to establish close relation with her. Because of this hopeless marriage, she develops "an intense dislike of the sexual act with her husband, a physical repulsion from the man she married" (63). In one of her poems she presents her far of sexual act. "But tell me, friend, did Lakshmi too twist brocade tassels around her fingers and tremble, fearing the coming of the dark-coloured, engulfing night?" (66)

A husband's right over his wife body is socially acclaimed and it becomes a wife's duty to satiate the material pleasure of her life partner. Shashi Deshpande in her fiction makes a scathing attack on such meaningless traditional dogmas that permit a male to have right to quench his biological needs without giving any priority to wife's consent, thus, sanctioning crimes like marital rape. As Indrani Jaisingh opines,

"It is assumed that by marrying a man, a woman has given her consent to sexual intercourse with her husband at any time. Thus, even if he forces himself on her, he is not committing an offence (of rape) as her consent is assumed" (17).

Through the character of Kalpana, Deshpande sketches the plight of a raped girl, who is cursed by her own mother for her vegetal (rape) state in

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the hospital little does Shakutai (the mother) realize that Kalpana's boldness, her waywardness are not those of one of her sexual violators; rather it is her own maternal uncle, who lets the beast out of him and tries to silence her by raping her. Ignorantly, she blames her own daughter, for bringing such shame and dishonour to their family. The virtues of 'Virginity and chastity' are firmly rooted in our society since ages, making rape the most serious, disgusting and horrible of all the crimes. As Adrienne Rich also observes, "it is not rape of the body alone but rape of the mind as well". Although, our society believes that the term 'Marital Rape' can't be applied to the Indian context but a rape is regardless of where and in what context it occurs. A marriage should not be held as a license to rape anyone. Societies such as India that condemn adulterous relationships often force men into marital relationships only for free access to physical consummation, which puts women under immense sexual threat.

This unsympathetic and biased mindset of society, media, judiciary, and police adds misery to the innocent victims of sexual assaults. In the novel, a case is registered by police officer on Kalpana as an accident and not as a Rape-Victim. As he says, "She's going to die anyway, so what difference does it make whether on paper, she dies the victim of an accident or a rape" (88). So, this inhuman treatment towards women is shown in these forms of rejection, isolation, loneliness, and negation from society and living partner of their own families is portrayed through the lives of Vaana, Mira, Shakutai, Urmi, and Kalpana.

The decision of Urmi to publish the poems of Mira: a step towards her resurrection, to make her dynamic again. Urmi risks the friendship of Vaana because it involves the exposure of her father's behaviour. The novel *The Binding Vine* is different from Deshpande's first three novels. Protest against societal roles and attitudes come easily from the protagonists. In the earlier novel of Deshpande, no other character is rebellious as Urmila presented in the novel. Her protagonists of previous novels know of the disparities in the society but they never tried to set them right. But Urmila revolts against the inequality, knowing fully of the unequal treatment given to women. "The hope for Indian women lies in the happy fact, that though, here are Mira's and Kalpana's and Shakutai's, we also have our Urmila's. (Nityanandham. 66).

Though Urmi has no relation with Kalpana and Shakutai but, she shares a bond of 'sympathy and emotional attachment. Her regular visits to hospital and their house show her concern towards these women. She becomes successful in making Shakutai understand that it's not Kalpana's

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fault but the real culprit who did this is the man, Prabhakar. The novel is quite different from the earlier ones in the sense that it introduces a concept of female relation i.e. the desire to help less fortunate female being by one woman. Indu, Saru, and Jaya battled their own battle. Urmi strives hard for other women with the help of her friend Malcom, she becomes successful in bringing the issue into limelight and government orders a fresh investigation. Her efforts become fruitful when Shakutai realizes who the real culprit was after suicide of Salu.

Though Urmila is educated who shows rebellious side of her nature but this nature never shows male heartedness. She does not seem to believe. Simmon De Beauvoiu's is in opinion that marriage diminishes man but almost annihilates woman. She believes in the institution of marriage and its importance in the lives of women like Sulu and Shakutai for who it guarantees a 'social, economic and physical security'. She finds herself in a better position as she is known of herself, educated, economically independent to cope up with any adverse circumstance. She realizes that a relationship becomes strained when one refuses to flow with the main stream'. And this realization with her husband Kishore, that one day he will remove his armour of withdrawal' and she will try 'to reach his soul'. She realizes her pain of losing Anu, but she still has Kartik. She understands that however oppressive these are, however doleful and hopeless our experiences are, one should never give up: "We struggle to find something with which we can anchor ourselves to this strange world we find ourselves in only when we love? Do we love to find this anchor?" (137).

She understands the power of love that binds people and save them from being an alienated one. It is only through love that Urmi become successful in bringing a change in Shakutai. She surpasses all her fellow women characters and her earlier counterparts in the sense that she tries to ameliorate the conditions of less fortunate one. Truly, she emerges as the voice of the voiceless by societal norms. In spite of understanding of the value of love and relationships, she receives the greatest knowledge from Shakutai.

This is how life is for most of us, most of the times: We are absorbed in the daily routine of living. The main urge is always to survive (203).

And they become successful in this urge to survive which becomes clear from their busy routine given on the last pages of story. She consents to Mira, who says, "Just as the utter fertility of living overwhelms me, I am terrified by the thought of dying, of ceasing to be" (203).

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Thus, the need of the survival makes the novel, *The Binding Vine*, a good novel from the earlier one and the feeling of female solidarity which Urmi shows, puts her on upper pedestal than Indu, Saru, and Jaya. She believes that a change is a slow but sure process. Things are gradually improving; hence Urmi is not a revolt against the existing doleful system. She just tries to encourage her fellow women to redefine themselves. The society she lives in demands total surrender, total silence on part of women. But she rejects to surrender to this hypocrisy and strove against this conspiracy of 'silence'. She attempts to locate a road beyond this silence where the inexplicable pain and forgotten tales could find a place to itself heard.

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International Book of Multidisciplinary Studies

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Chapter - 13

The Emancipated Protagonist in *The Binding Vine* of Shashi Deshpande: A Study

Dr. R. Prabhakar,
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Abstract

Deshpande is a well-known and prolific writer who explores the pains and pangs and predicaments of women and loss of their identity in the male dominated society. She has portrayed women questing for their identity and selfhood. Whereas her couple of earlier novels portrayed women protagonists with a cloistered self, who are unable to overcome, break and resist the so called socio patriarchal shackles of domination. But in her next couple of fictional works, *The Binding Vine* (1993) and *A Matter of Time* (1996), female protagonists are portrayed with a new rejuvenated spirit who resist and break the mute suffering. This paper aims at liberation of Deshpande's women characters from silence suffering to resistance. However, the protagonists in this novel, akin to her previous novels, are bold women who speak out boldly against the false attitude of the patriarchal society. The major character in *The Binding Vine* is completely different from Shashi Deshpande's earlier protagonists. Being educated women, she realizes the constraints imposed by the tradition, the meaninglessness life of modern women in the male chauvinistic society. Urmila, the protagonist of the novel, liberates herself from the shackles of tradition and gives her voice to the voiceless.

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a grave shortcoming on her part and a continuous complex of perplex in her life: "After marriage she changed. She was frightened, always frightened. What if he doesn't like this, what if he wants that, what if he is angry with me, what if he throws me out? (195). Here Deshpande highlighted the loopholes of Indian institution of marriage and she exposed how it demoralized the vivacious girl and turned her into a fearful and nervous human being.

Shakutai, unlike her sister Sulu, hesitates to continue the meaningless marital relation and to be a better half of good-for-nothing husband. Meanwhile, she knows the fact that it is not a cakewalk for a woman to get out of marital relation. Thus, Shashi Deshpande clearly exposes how the institution of marriage suppressed women, how it imposes implacable pain upon married woman and makes life miserable. However, irrespective of their professions or domestic lives every woman considers marriage as a trap from which they cannot escape from their life time. But the Shashi Deshpande's protagonists' greatness is that they never attempt to break their marital relationship.

The strained relationship and lack of mutual understanding between wife and husband obviously affects the mother daughter relationship. It is evident that Shashi Deshpande's heroines seem to have hostility towards mothers. *The Binding Vine* mirrors the mother-daughter strained relationship through the examples of Urmila's mother – Mira, Shakutai – Kalpana, Akka – Vaana and Vaana – Mandira. No pair mentioned here enjoyed the harmonious relation that gratifies their mental and emotional needs. Deshpande beautifully depicted the bitter reality of male dominated society where woman ratifies to the traditional values for their survival. The traditional and conservative women believe it is necessary to oblige the social norms to make their life meaningful and successful. The woman became preservers of these social norms which they consider as ideals, and these mothers inject the values in their daughters. As Simon de Beauvoir points out: with

Most women simultaneously demand and detest their feminine condition; they live it through in a state of resentment-vexed at having produced a woman. She hopes to compensate for her inferiority by making a superior creature out of one whom she regards her double... Sometimes, she tries to impose on the child exactly her own fate: what was good enough for me is good enough for you, I was brought up this way, you shall share malot. (533-34).

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The separation between Urmi's and her mother result in Urmi's anger on her mother. Though the dominating nature of Urmi's father caused the separation between mother-daughter but it was the mother of Urmi who had to experience the rage and wrath of her daughter. Vaana and Mandira couldn't enjoy harmonious relation due to their dual role in their lives. "I don't want Hirabai, I want my mother" (72). But the most precious and pious bond between mother and daughter, cupped with tensions and complications is the one between Kalpana and Shakutai. Shakutai's estrangement with Kalpana starts even before her birth. As she accepts before Urmi, "I didn't want the child. I didn't want Kalpana. In wanted her to die". So, the forced motherhood brings out more burden than the emotional fulfilment. Kalpana's carefree outlook filled her with a kind of fear when she says, "If you pant and flaunt yourself, do you think they will leave you alone?" (146). Kalpana holds her mother responsible for her desertion (Shakutai) by her father. She said, "You're always angry, always quarrelling, that's why he's gone" (93).

This determined attitude of Kalpana towards mother and also she hesitated to share anything with her mother. Shakutai fails to read the heart of her daughter who wants to lead an independent and carefree life which her mother and aunt never experienced. The mother in the novel symbolizes tradition and the male domination determined their attitude. This male domination and social norms caused the strained relations between mothers and daughters in the novel. Rousseau's statement that "Man is in chains everywhere" is apt in the context of woman as well. No traditional value protects women from sexual violation or any physical abuse. The purity and chastity of her body is damaged through unavoidable physical relation. Frank Hosken opines that cruelty against female is perpetrated "with an astonishing consensus among the men in the world "Every married man strongly believes that he has every right on the soul and body of his wife and thinks that the body of his wife is his property. Committing sexual abuse on one's wife is also a criminal act but, in our society, no one considers it as crime. Deshpande is brave enough to deal with such subject in her novel. In her earlier novel *The Dark Holds No Terrors*, she talked about the issue of 'marital rape' and in this novel she confirms that rape is not only mere a social sin but a 'psychological perversion stemming from desire to overpower the self and identity of woman'.

In India, an overall continuum of silence seems to pervade this issue, which if at all is discussed in Indian milieu, is done in whispers and subdued tones. But one should always remember that if words have consequences then silence too. Silence speaks a lot; it means a lot but no one knows about

this except the person who is silent. Similarly, in this novel Urmi is voicing not only her own despairs and frustrations but those of each and every woman who is a victim of this male-driven world and is not allowed to think herself as an entity. Imtiaz Dharker in her poem, "Sacrifice" emphasizes that society and tradition weigh to heavily on a woman's consciousness that fear along can sum up her situation. Traditionally, women are seen as 'belonging to men like their property'. In this context Bhattacharya Benarjee opines:

Herself a piece of commodity she could not give gifts but could be given in sacrifice, always lost and won in chess, bought or sold as goods. She had no right to property; none over her own body-she was a man's absolute possession" (32).

So, the binaries of male/female, man/woman, powerful/powerless are central to the issue of rape. Moreover, the fear of rape curtails a woman's freedom, confining her to mere a scapegoat of 'seemingly happy homes' in India, since "Rape is dishonour, a shameful thing for a woman. It is a crime where the victim faces "dejection (of both society and her family) (Premilatha 23).

The suffering of Mira, for Urmi, is similar to an innocent goat waiting to be killed by her tender age of 18, though she desires to educate herself further and improve her poetic skill. But the manipulative behaviour of her husband succeeds in getting her as his wife. He is interested in her body and unable to establish close relation with her. Because of this hopeless marriage, she develops "an intense dislike of the sexual act with her husband, a physical repulsion from the man she married" (63). In one of her poems she presents her far of sexual act. "But tell me, friend, did Lakshmi too twist brocade tassels around her fingers and tremble, fearing the coming of the dark-coloured, engulfing night?" (66)

A husband's right over his wife body is socially acclaimed and it becomes a wife's duty to satiate the material pleasure of her life partner. Shashi Deshpande in her fiction makes a scathing attack on such meaningless traditional dogmas that permit a male to have right to quench his biological needs without giving any priority to wife's consent, thus, sanctioning crimes like marital rape. As Indrani Jaisingh opines,

"It is assumed that by marrying a man, a woman has given her consent to sexual intercourse with her husband at any time. Thus, even if he forces himself on her, he is not committing an offence (of rape) as her consent is assumed" (17).

Through the character of Kalpana, Deshpande sketches the plight of a raped girl, who is cursed by her own mother for her vegetal (rape) state in

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the hospital little does Shakutai (the mother) realize that Kalpana's boldness, her waywardness are not those of one of her sexual violators; rather it is her own maternal uncle, who lets the beast out of him and tries to silence her by raping her. Ignorantly, she blames her own daughter, for bringing such shame and dishonour to their family. The virtues of 'Virginity and chastity' are firmly rooted in our society since ages, making rape the most serious, disgusting and horrible of all the crimes. As Adrienne Rich also observes, "it is not rape of the body alone but rape of the mind as well". Although, our society believes that the term 'Marital Rape' can't be applied to the Indian context but a rape is regardless of where and in what context it occurs. A marriage should not be held as a license to rape anyone. Societies such as India that condemn adulterous relationships often force men into marital relationships only for free access to physical consummation, which puts women under immense sexual threat.

This unsympathetic and biased mindset of society, media, judiciary, and police adds misery to the innocent victims of sexual assaults. In the novel, a case is registered by police officer on Kalpana as an accident and not as a Rape-Victim. As he says, "She's going to die anyway, so what difference does it make whether on paper, she dies the victim of an accident or a rape" (88). So, this inhuman treatment towards women is shown in these forms of rejection, isolation, loneliness, and negation from society and living partner of their own families is portrayed through the lives of Vaana, Mira, Shakutai, Urmi, and Kalpana.

The decision of Urmi to publish the poems of Mira: a step towards her resurrection, to make her dynamic again. Urmi risks the friendship of Vaana because it involves the exposure of her father's behaviour. The novel *The Binding Vine* is different from Deshpande's first three novels. Protest against societal roles and attitudes come easily from the protagonists. In the earlier novel of Deshpande, no other character is rebellious as Urmila presented in the novel. Her protagonists of previous novels know of the disparities in the society but they never tried to set them right. But Urmila revolts against the inequality, knowing fully of the unequal treatment given to women. "The hope for Indian women lies in the happy fact, that though, here are Mira's and Kalpana's and Shakutai's, we also have our Urmila's. (Nityanandham. 66).

Though Urmi has no relation with Kalpana and Shakutai but, she shares a bond of 'sympathy and emotional attachment. Her regular visits to hospital and their house show her concern towards these women. She becomes successful in making Shakutai understand that it's not Kalpana's

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fault but the real culprit who did this is the man, Prabhakar. The novel is quite different from the earlier ones in the sense that it introduces a concept of female relation i.e. the desire to help less fortunate female being by one woman. Indu, Saru, and Jaya battled their own battle. Urmi strives hard for other women with the help of her friend Malcom, she becomes successful in bringing the issue into limelight and government orders a fresh investigation. Her efforts become fruitful when Shakutai realizes who the real culprit was after suicide of Salu.

Though Urmila is educated who shows rebellious side of her nature but this nature never shows male heartedness. She does not seem to believe. Simmon De Beauvoiu's is in opinion that marriage diminishes man but almost annihilates woman. She believes in the institution of marriage and its importance in the lives of women like Sulu and Shakutai for who it guarantees a 'social, economic and physical security'. She finds herself in a better position as she is known of herself, educated, economically independent to cope up with any adverse circumstance. She realizes that a relationship becomes strained when one refuses to flow with the main stream'. And this realization with her husband Kishore, that one day he will remove his armour of withdrawal' and she will try 'to reach his soul'. She realizes her pain of losing Anu, but she still has Kartik. She understands that however oppressive these are, however doleful and hopeless our experiences are, one should never give up: "We struggle to find something with which we can anchor ourselves to this strange world we find ourselves in only when we love? Do we love to find this anchor?" (137).

She understands the power of love that binds people and save them from being an alienated one. It is only through love that Urmi become successful in bringing a change in Shakutai. She surpasses all her fellow women characters and her earlier counterparts in the sense that she tries to ameliorate the conditions of less fortunate one. Truly, she emerges as the voice of the voiceless by societal norms. In spite of understanding of the value of love and relationships, she receives the greatest knowledge from Shakutai.

This is how life is for most of us, most of the times: We are absorbed in the daily routine of living. The main urge is always to survive (203).

And they become successful in this urge to survive which becomes clear from their busy routine given on the last pages of story. She consents to Mira, who says, "Just as the utter fertility of living overwhelms me, I am terrified by the thought of dying, of ceasing to be" (203).

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Thus, the need of the survival makes the novel, *The Binding Vine*, a good novel from the earlier one and the feeling of female solidarity which Urmi shows, puts her on upper pedestal than Indu, Saru, and Jaya. She believes that a change is a slow but sure process. Things are gradually improving; hence Urmi is not a revolt against the existing doleful system. She just tries to encourage her fellow women to redefine themselves. The society she lives in demands total surrender, total silence on part of women. But she rejects to surrender to this hypocrisy and strove against this conspiracy of 'silence'. She attempts to locate a road beyond this silence where the inexplicable pain and forgotten tales could find a place to itself heard.

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BIODIVERSITY AND ECOTOURISM



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BIODIVERSITY OF EARTHWORMS AND VERMI-CULTURE

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Abstract

The old traditional agriculture practice, in the tropical region was based on some kind of rotational system and was entirely dependent on soil organic matter and manure, particularly farmyard manure. But the modern agriculture practice, intensive and continuous due to increased human population and pressure on land, is based on development of improved varieties of crops, chemical fertilizers and pesticides. But the tropics where the human populations are more and poor do not have the adequate infrastructure, particularly economy, necessary for sustained intensive agriculture. In such a context it is essential that agriculture practices give priority to agro-forestry or herbaceous legumes based cropping system based on local conditions and regulate soil fertility by biological processes. This could be done by increased efficiency of the use of natural resources, which is otherwise known as organic farming. Vermi-composting is one of the practices of organic farming.

Introduction

The soil is a living entity and an ecosystem containing varieties of flora and fauna, a growing medium for crops, a place where plant can anchor their roots and absorb their nutrients. Living organisms, water, air, organic matter and minerals are the components of soil ecosystem. Soil like other ecosystem depends on the ultimate source of energy, sunlight, for its functioning and cycling of nutrients. Soil has been very generous to us - feeding and supporting but we in turn have been cruel -gradually denuded the forests, excavated mines, dumped pesticides and weedicides, applied chemical fertilizers, reduced the floral and faunal bio-diversity, all ultimately leading to erosion of soil and gradual loss of fertility.

Materials and Methods:

The objective of the paper is to examine the growth of earthworms and their life cycle. Press mud is used as primary material as substrate for the growth of the earth

worms. Ordinary soil and cow dung were used as controls. Samples are left in the room temperature under shady conditions and water is sprinkled daily in the morning. Samples are taken for the assessment such as weight, length etc., on weekly basis for 12 weeks.

Results and discussion:

External characteristics of earthworms:

Earthworms have to be closely examined of the following characters to be identified: body shape, segmentation, prostomium, dorsal pores, clitellum, setae, genital pores, genital markings, the disposition of gastric, vascular, excretory and reproductive organs (Stephenson, 1923). Size and color are of little importance in the identification of earthworms. Measurements have to be taken in contracted worms and the diameter is to be measured in front of the clitellum. The following four age of earthworms are to be carefully examined for proper identification. Juveniles are young earthworms lacking genital markings, luminescence and clitellum, a clitellate worms are adolescent worms with genital markings, but without clitellum, clitellate or adult worms are with genital markings and prominent clitellum and post sexual or senescent worms are dull coloured without clitellum and with hardened seminal vesicle.

Internal characteristics of earthworms:

According to Julka (1988), an authority on Indian earthworms, besides these external characteristics the disposition of digestive, excretory, vascular and reproductive organs are also of taxonomical use. The number and position of gizzard is taken into consideration in distinguishing the earthworm genera. Calciferous glands, associated with esophagus vary in size, shape, number and arrangement. To some extent it helps in taxonomy. The beginning of the intestine, constant within a species, the intestinal caeca (shape, position and number) and the typhlosole are of great systematic help. A few characteristics of the simple, vascular system are also of taxonomic importance: 1. the dorsal blood vessel may be single or double, 2. the supra-esophageal blood vessel's presence or absence and if present single or double, 3. the presence and absence of extra-esophageal and latero-parietal vessels and 4. the number and position of the "lateral hearts".

Reproduction:

Reproduction is by cross-fertilization in majority of the species of earthworms but parthenogenesis also occurs in few. During copulation two worms come together in

opposite directions, with the ventral surface attached to each other in such a way that the spermathecal openings touch each other. The seminal grooves carry the seminal fluid from the male pores to the clitellar region and enter the spermathecae of the partner worms. In general, like *Eisenia*, *Lumbricus*, *Dendrobaena*, *Dendrodrilus*, *Aporrectodea* and *Octalasion* sperms are transferred through spermatophore. After copulation the clitellum produces cocoon. The cocoon contains ova, albuminous fluid and spermatozoa. The cocoon morphology varies among the different species of earthworms; it is spherical, lemon shaped or oblong with pointed tips. They may be white, yellow or brown, the color changes from yellow to brown during the incubation time. Immediately after laying they are white or yellow and gradually turn into brown as development proceeds. The rate of hatching varies between species. Stephenson (1930) found 1 to 20 fertile ova in each cocoon. *E. fetida* was reported to release an average of 3.3 hatchling/coco (Edwards, 1988) and in laboratory conditions more than one hatchling was found emerge and survive in *E. eugeniae* (Ramalingam, 1997) and *E. fetida* when they were cultured in press-mud (Ramamoorthy, 2004).

Growth: There are two different opinions with regard to the mechanism of growth in earthworms, some favoring the idea that new segments are added during growth and some are of the opinion that growth is only by enlargement of segments. Many workers have found that the pattern of growth in many species of earthworm follow a sigmoid curve (Neuhauser et al., 1988). In general the period of growth before reproduction was rapid but after sexual maturity there was a decline in the growth rate. Ramalingam (1997) and Vinotha (1999) have studied the influence of nutrition, temperature and moisture and found that *E. eugeniae* when grown in dung and press-mud exhibit rapid growth till the worm developed a swollen clitellum and started oviposition and later the rate of growth had declined *E. eugeniae* has a high growth rate and fecundity than *E. fetida* (Viljoen and Reinecke, 1992).

Life cycle: Earthworms breed continuously or semi-continuously. In tropics during summer there is a break in breeding activity due to high temperature and reduced soil moisture. More cocoons are laid during pre-monsoon, monsoon and post-monsoon periods (Dash and Senapati, 1982). Worms undergoing summer diapause, *Eisenia*, *Allolobophora*, *Octalasion* and *Lampitodo* not produce cocoons during this period. Besides moisture and temperature, it has been shown that if *Eudriluseugeniae* and

Lampitoma mauritii were fed with cattle dung or press-mud (waste from cane sugar mills) they laid more cocoons than control worms kept in farm yard manure (Ramalingam, 1997; Ranganathan and Parthasarathi, 1999). It has also been shown that the size of the cocoon is correlated with the size of the worm (Lavelle, 1981). The incubation time taken by the cocoons to hatch varies with species, ranging from 16 days for *E. eugeniae* (Ramalingam, 1997) to 5 month for *Eisenia rosea* (Wilcke, 1952).

Table
1. Pattern of growth in *E. eugeniae* and *L. mauritii*

| Age(days) | <i>E. eugeniae</i> | | <i>L. mauritii</i> | |
|-----------|--------------------|-------------|--------------------|-------------|
| | Body length(cm) | Biomass(mg) | Body length(cm) | Biomass(mg) |
| 01 | 0.5 | 5 | 0.7 | 5 |
| 10 | 5.0 | 110 | 4.0 | 50 |
| 20 | 10.8 | 870 | 5.5 | 135 |
| 30 | 16.0 | 1480 | 8.0 | 245 |
| 40 | 17.5 | 2430 | 9.0 | 350 |
| 50 | 25.0 | 3200 | 9.6 | 510 |
| 60 | 28.3 | 3480 | 12.5 | 740 |
| 70 | 29.2 | 3840 | 12.6 | 725 |
| 80 | 29.4 | 3850 | 12.6 | 730 |
| 90 | 33.8 | 4835 | 13.6 | 930 |
| 100 | 40.0 | 5750 | 14.4 | 1050 |
| 120 | 38.0 | 5200 | 18.0 | 1200 |
| 150 | 36.0 | 5120 | 19.6 | 1500 |
| 180 | 42.7 | 5250 | 21.5 | 1650 |
| 210 | 43.7 | 5000 | 27.8 | 1780 |
| 240 | 44.5 | 4820 | 27.6 | 1680 |
| 270 | 40.0 | 4000 | 22.5 | 1630 |
| 300 | 42.0 | 4300 | 24.6 | 1510 |
| 330 | 43.6 | 4000 | 21.9 | 1350 |

Conclusion: The natural process of decomposition of organic residues by earthworms has been taking place even before the advent of man on this earth and has been recently recognized and practiced under controlled conditions for his benefit. Due to his

knowledge of the biology of the worms, the chemistry of composting and understanding of the role of microorganisms in decomposition he began to manipulate factors essential for composting so as to derive the best advantage. On this natural logic, vermicomposting is therefore a basic process, varying from climatic zone to climatic zone and due to raw materials and species of earthworm used. The species of earthworms available in Europe or America, the climate, microorganisms in the soil and the chemical composition of agro-industrial or industrial or wastes generated by human activity is different from the tropical Indian conditions. Therefore, the technology adopted in the cold, temperate countries cannot be blindly adopted in our country.

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**BIODIVERSITY OF INVERTEBRATES IN THE MANGROOVES AT
CHIPPALERU ESTUARY, LAKSHMIPURAM VILLAGE, THUMMALA
PENTA, KAVALI, SPSR NELLORE DT.A.P**

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Abstract

Mangroves, admittedly, are not only important but crucial for the coastal areas. Since estuarine areas are highly populated areas, the slightest ecological imbalance will take a heavy toll. They play a vital role in stabilizing these areas. No engineering and technological solutions can be sought for stabilizing these areas. Even if we negate all benefits of mangroves as forests, their value as "protector of shore-line" is enough to convince us for conserving them. Mangroves are buffers between the land and the sea. Coastlines throughout the world are facing serious problems of coastal erosion and threat of rising sea levels due to global warming has increased the threats by several folds. To control such assault of the sea on land the nature has provided what is called as Mangroves, a tropical littoral ecosystem which is more dynamic than the sea itself. Mangroves not only help in preventing soil erosion but also act as a catalyst in reclaiming land from seas. This is a very unique phenomenon, since there is a general tendency of water to engulf land. Mangrove forests and estuaries are the breeding and nursery grounds for a number of marine organisms. The conservation of mangroves as well as the rich fauna habituating them is an immediate necessity of the hour. Hence this paper may provide a platform for enlightening the society about the biodiversity of Mangrooves located near Chippaleru Estuary.

Keywords: Conservation, Mangrovefauna, Invertebrates, Marine Environment
Biodiversity

Introduction

Numerous attempts have been carried out worldwide on the extent and diversity of mangroves. Some of the most important ones on a global, national and regional context are summarized below. The greatest extent of mangrove species is found in the Indo-Malaysian region (Chapman, 1975) and thus, it can be considered as the cradle of evolution of mangrove vegetation. There are about 60-100 species of mangroves totally present in the world coming under 30 genera and more than 20 different families (Singh

et al., 1987). Studies on their status and distribution in Asia reports that they are distributed mainly in Bangladesh, Indonesia, Pakistan, Srilanka, Philippines and India (Naskar and Mandal, 1999). Earlier reports reveal that globally mangroves cover an area of 12 to 20 million hectares, of which, about one-third is found in Asia (42%), followed by Africa (21%), North and Central America (15%), Oceania (12%) and South America (10%). It has also been reported that 15 countries behold one third of the total global mangroves (FAO, 2007). Later, the total area of mangroves in the year 2000 was estimated to be 1, 37,760 km² in 118 countries in the tropical and subtropical regions of the world (Giri et al., 2011). Spalding et al. (2010) revealed the World Atlas of Mangroves, covering 123 countries, constituting a total area of 1, 52,000 km². The lists included both true mangroves and mangrove associates. Distribution status by Hamilton and Casey (2016) showed that mangroves are found in 105 nations globally; of which 10 nations possess approximately 52%. Higher percentage of global mangrove cover was noted in (26-29%). The Sundarbans National Park in India and the Sundarbans Mangrove Forests in Bangladesh have been known to possess the world's largest continuous stretch of mangrove forest (UNESCO, 2016). India has been reported for holding the fourth largest mangrove cover in the world. 60 species of mangroves belonging to 41 genera and 29 families have been reported (Blasco, 1975). Blasco (1977) reported 58 mangrove species in the Indian territories, while Rao (1986) listed 60 species from 41 genera and 29 families. Studies have reported that the country occupies an area of about 7% of the world mangroves (Krishnamurthy, 1987) and 8% of the Indian coastline (Untawale, 1987). Status report on mangroves of India in 1987 and report of the Inter alia Forest Survey of India stated that, within the 7,500 km coastal line, India supports 4, 87,100 ha of mangrove wetlands, in that nearly 56.7% is spread along the east coast, 23.5% along the west coast and the remaining 19.8% in Andaman and Nicobar islands (MoEF, 1987). The report has also stated that Sundarbans of West Bengal and Andaman and Nicobar Islands together occupy 80% of the total Indian mangroves. Rest of the mangrove flora have been distributed along some of the coastal states such as Maharashtra, Gujarat, Orissa, Goa, Andhra Pradesh, Tamil Nadu, Karnataka and Kerala (MoEF, 1987). Banerjee et al. (1989) reported 59 species including true mangroves and associates belonging to 41 genera and 29 families. Comprehensive studies reported the existence of 32 true mangrove species in India (Singh et al., 2012; Singh and Garge,

1993). Dagar et al. (1993) and Jagtap et al. (1993) reported 36 and 50 species of true mangroves from India. Later in 1999 it has reported that including the island territories, India has a total of 7,516.6 km coastline. Of these, 6,749 km² areas were occupied by mangrove forest (Naskar and Mandal, 1999). Studies with respect to species distribution revealed varied statistics as some of them included true mangroves whereas others included both true mangroves and mangrove associates. Naskar (2004) has reported 85 species of mangroves/ mangrove associates that were common to the Indian coasts. Studies have also reported that, there are 55 species of true mangroves in India and majority are coming under the families Acanthaceae, Avicenniaceae, Meliaceae and Rhizophoraceae (Vidyasagan and Gopikumar, 2006). Detailed account on the diversity of Indian mangroves has been given by Mandal and Naskar (2008). The total extent of mangroves has been classified in to 3 groups as 'Major mangroves,' Mangrove associates,' and 'Back mangal'. From a total of 12 habitats, 82 species of mangroves belonging to 52 genera and 36 families have been reported. Using the total number of families, genera and species, relative mangrove diversity has also been calculated. Among different habitats studied, maximum value for relative mangrove diversity has been reported from Sundarbans and minimum from Lakshadweep Atoll (Mandal and Naskar, 2008).

The present study signifies the importance of mangroves in the conservation of Biodiversity of Invertebrate fauna as the conservation and protection of Mangroves are very much needed.

Material and Methods

As part of my study on mangroves of Nellore district, I happened to visit Lakshmipuram of Annagaripalem in Kavali mandal. Coordinates: 0 1 11 0 1 11 14 49 25.94 N, 80 04 37.34 E. The swamps of the above location are about 1 km to the east of Lakshmipuram, a fishermen hamlet in Annagaripalem panchayat of Kavali mandal. In order to reach these swamps one has to cross the Buckingham canal. The entire area to the east of Buckingham canal is heavily invaded with *Prosopis chilensis*, which has extended farther into the salt marshes. There salt marshes are adjacent to Chippalera, a brackish water creek which flows from west to east and merges with Bay of Bengal after branching off into a few smaller creeks. As part of my study on mangroves of Nellore district, I happened to visit Lakshmipuram of Annagaripalem in Kavali mandal and

collected several Invertebrates. For the identification of Invertebrates we have followed the standard book "A field Guide to the Common Invertebrates of the East Coast of India (Fernando and Fernando, 2002)".

Results

We have visited the study area several times and collected several invertebrate with the help of animal collecting nets. We have arranged a person to collect the fauna located at the study area

List of fauna

| Sl.No | Vernacular Name | Scientific name | Classification |
|--------------------------------|-----------------------|--------------------------|---------------------------|
| Phylum: Porifera | | | |
| 1 | | Comb jellies | Ctenophora |
| 2 | | Heteractis magnifica | Family: Stichodactylidae |
| Phylum: Cnidarians | | | |
| 1 | Sea pen | Pennatularubra | Family: Pennatulidae |
| 2 | Portuguese man of war | Physaliaphysalis | Family: Physaliidae |
| 4 | | Aurelia aurata | Family: Ulmaridae |
| 5 | | Crambionellastuhlmanni | Family: Catostylidae |
| 6 | | Gorgonellaumbraculum | Family: |
| 7 | Plumose anemone | Metridium | Family: Metridiidae |
| 8 | | Echinomuricea indicia, , | Family: Plexauridae |
| 9 | | Echinogorgia complex | Family: Plexauridae |
| Phylum: Platy helminths | | | |
| 1 | Flat worms | Meixneriafurva | Family: Callioplanidae |
| 2 | | Limnostylochussps., | Family Stylochidae |
| Phylum: Nematoda | | | |
| 1 | Peanut worm | Phascolosomaarcuatum | Family: Phascolosomatidae |

| | | | |
|---------------------------|-----------------------|-------------------------------------|-----------------------|
| 2 | | <i>Neochromadorapoecilosomoides</i> | Family: Chromadoridae |
| Phylum: Annelida | | | |
| 1 | Gregarious Tube worms | <i>Capitellaspis</i> | Family: Capitellidae |
| 2 | Solitary tube worm | <i>Diopatraneapolitana</i> | Family: Eunicidae |
| 3 | Keel worm | <i>Pomatoleiosp.</i> | Family: Serpulidae |
| 4 | Clam worm | <i>Nereissuccinea</i> | Family: Nereididae |
| Phylum: Arthropoda | | | |
| 1 | Marine king crab | <i>Tachypleusgigas</i> | Family: Limulidae |
| 2 | | <i>Carcnoscorpiusrotundicauda</i> | Family: Limulidae |
| 3 | Caridean shrimp | <i>Pandalus borealis</i> | Family: Pandalidae |
| 4 | Tiger prawn | <i>Penaeus monodon</i> | Family: Penaeidae |
| 5 | Indian prawn | <i>Penaeusindicus</i> | Family: Penaeidae |
| 6 | Fiddler crab | <i>Ucacrassipes</i> | Family: Ocypodidae |
| Phylum: Mollusca | | | |
| 1 | Lamp Shells | <i>Lingula unguis</i> | Family: Linguidae |
| 2 | Gastropods | <i>Assimineanitida</i> | Family: Assimnidae |
| 3 | | <i>Cerithidea cingulate</i> | Family: Potamididae |
| 4 | | <i>Cerithedia obtuse</i> | Family: Potamididae |
| 5 | | <i>Telescopium Telescopium</i> | Family: Potamididae |
| 6 | | <i>Littorariamelanostoma</i> | Family: Littorinidae |
| 7 | | <i>Littorariacarnifera</i> | Family: Littorinidae |
| 8 | | <i>Littorariaangulifera</i> | Family: Littorinidae |
| 9 | | <i>Littorariapallescens</i> | Family: Littorinidae |
| 10 | | <i>Littorariaconica</i> | Family: Littorinidae |
| 11 | | <i>Clithonoualaniensis</i> | Family: Neritidae |
| 12 | | <i>Neritinaviolacea</i> | Family: Neritidae |
| 13 | | <i>Neritahistrio</i> | Family: Neritidae |
| 14 | | <i>Haminoeasp.</i> | Family: Haminoeidae |
| 15 | | <i>Cassidulanucleus</i> | Family: Ellobium |
| 16 | | <i>Onchidiumsp.</i> | Family: Onchidiidae |

| | | | |
|------------------------------|-----------------------|------------------------|------------------------|
| 17 | Bivalves | Anadaragranosa | Family: Arcidae |
| 18 | | Meretrixmeretrix | Family: Veneridae |
| 19 | | Pernaviridis(Linnaeus, | Family: Mytilidae |
| 20 | | Crassostreamadrasensis | Family: Ostreidae |
| Phylum: Echinodermata | | | |
| 1 | Mangrove brittle star | Ophiactissps. | Family: Ophiactidae |
| 2 | | Amphiura | Family: Amphiuridae |
| 3 | | Pisasterochraceus | Family: Asteroiidae |
| 4 | | Stichasterstriatus | Family: Stichasteridae |



Fig1: Comb Jellies



Fig2: Heteractis magnifica



Fig3: Physalia physalis



Fig4: Aurelia aurata



Fig5: Cribrodon stuhlmanni



Fig6: Gorgonia



Fig7: Metridium



Fig8: Echinomuricia



Fig9: Echinogorgia



Fig10: Meixneria furva



Fig11: Limnostylochus



Fig12: Peanut worm



Fig:13, *Neochromadorasps.*



Fig:14 *Capitellasp.,*



Fig:15 *Diopatraneapolitana*



Fig16: *Pomatoleios*



Fig17: *Nereissuccinea*



Fig18: *Tachypleusgigas*



Fig19: *Carcnoscorpiusrot*



Fig20: *Pandalus borealis*



Fig21: *Peneus monodon*

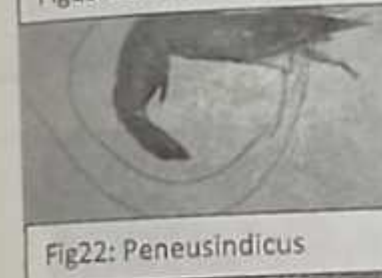


Fig22: *Peneusindicus*



Fig23: fiddler crab- *Ucasps.*

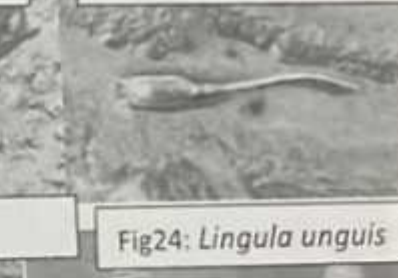


Fig24: *Lingula unguis*



Fig25: *Cerithidea cingulate*



Fig26: *Cerithideaobstusa*



Fig27: *Telescopium telescopium*



Fig28: *Littoriamelanostoma*



Fig29: *Littoriacarnifera*



Fig30: *Littoriaangulifera*



Fig31: *Littoriapallescens*



Fig32: *Littoriaconica*



Fig33: *Clithroualaniensis*



Fig34: *Neritina violacea*



Fig35: *Neritahistro*



Fig36: *Hominoeasps.*



Fig37: *Cassidulanucleus*



Fig38: *Onchidiumsp.*



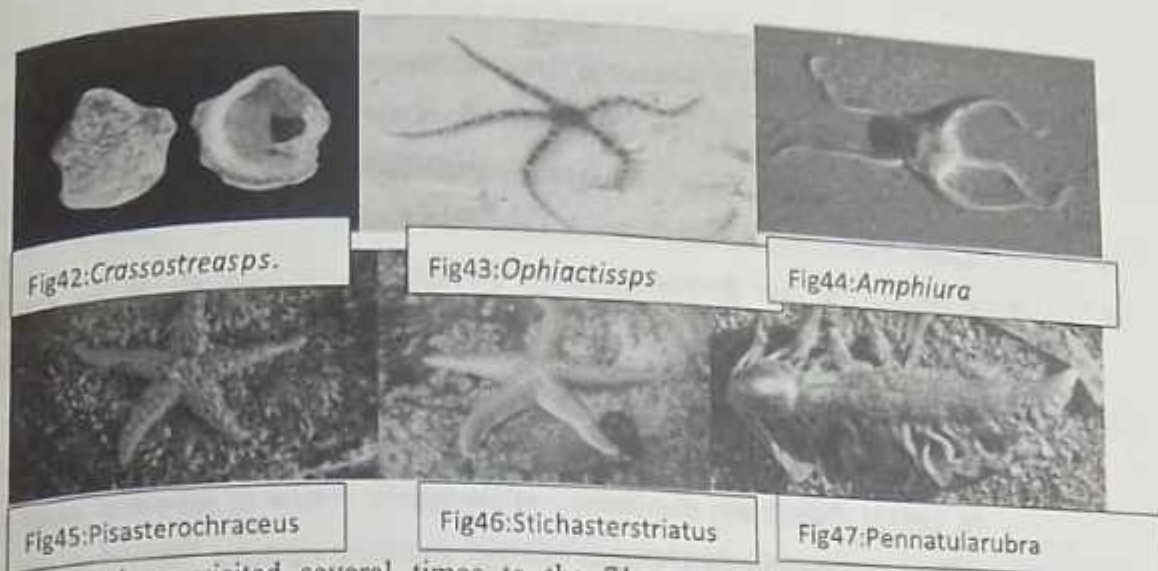
Fig39: *Anadaragranosa*



Fig40: *Meritrixmeritrix*



Fig41: *Pernavidis*



I have visited several times to the 71 mangroves near Chippaleru estuary and identified different species of invertebrate and vertebrate macro fauna. Among the total fauna almost 50 species of invertebrates were found. More number of cnidarians (9 families) and molluscs (21 families) were found when compared with other invertebrates. More number of Molluscs were found when compared with others. Varieties of crabs were more in the study area. Still much work is to be done.

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A REVIEW ON THE BIODIVERSITY OF EDIBLE BIVALVES IN INDIA

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Abstract

Coastal fisheries are an important source of food, employment and foreign exchange. In India, the marine fish production increased by about six times in the last 50 years reaching about 4.8 million tons in 2015. It provides employment to about one million fishermen and earns foreign exchange of nearly Rs. 1, 00,000 million. Most of the marine fish landings are from fishing operations in coastal shelf area especially from the shallower region ranging from 5 to 100 m depth. The molluscan fisheries resources are constituted by the edible and non-edible species. Production of various bivalves through simple indigenous culture techniques opened up avenues for development of these resources through training, transfer of technology and commercialization of the methods. Monitoring-of the harvesting of molluscan resources assumes greater importance with reference to rational exploitation and conservation. The enforcement of the existing laws and conservative measures would contribute to rational exploitation of the molluscan resources of the country. The present study is aimed to focus on the biodiversity of bivalves in India.

Key words: Biodiversity, Bivalves, edible species, Ecological study, conservation.

Introduction

The molluscan fisheries resources of India constituted by a wide variety of edible and non-edible Species occur in a wide range of habitats, typical of any tropical region. James Horneil the British biologist has exhaustively dealt with the Indian molluscan resources in his various publications and reports spanning over the period 1905 to 1951. The symposium on Mollusca conducted at Cochin in January 1968 by the Marine Biological Association of India created interest for further research on Molluscan resources. Aspects of biology and fishery of oysters, mussels, clams and gastropods have been studied earlier (Rai 1928, 1932 and 1933; Setnal 1933; Rao 1939; Jones 1950; Rao 1958 and 1969; Rao et al 1962, Anon 1966; Gokhale 1963; Nayar and Mahadevan 1967;

Narasimham 1969; Alagarwami and Narasimham 1973; Jones and Alagarwami 1973; Mahadevan and Nayar 1973; Rasalam and Sebastian 1976; Narasimham et al 1984; Rao and Rao 1985).

A comprehensive account of various molluscan resources have been given under the title 'Commercial Molluscs of India' (CMFRI 1974). Molluscs are exploited from time immemorial, but of late, the exploitation rate has been found to be on the increase, especially in certain localized areas causing concern for planned development. Although the meat of molluscs consider as highly nutritious, it has limited market in the country at present. At best, mainly angler's community and few others to a limited extent consume them in coastal areas. With increasing demand for protein rich foods from the sea, the demand for molluscan meat in the country has also been rising gradually and has even led to export markets in recent times.

| S.No. | Category | Resource | Common name | Local name |
|-------|-------------------|----------------------|-------------|---------------------------------------|
| 1 | Clams and Cockles | Villoritacyprinoides | Black clam | Karuttakakka,(Ma), Kala Khube (Ka) |
| 2 | | Paphiamalabarica, | Short neck | Poovan kakka (Ma), |

| | | | | |
|----|------------------|----------------------------------|------------------------|--|
| | | Paphiaspp | clam, Textile clam | Chippi kallu, Kesha maruvai (Ka), Tisre (Ko) |
| 3 | | Meretrix casta, M. meretrix | Yellow clam | Manja kakka (Ma) Matti (Ta) Maruvai Dadda/ Khude (Ka) |
| 4 | | Marcia opima Baby clam | Baby clam | Njavalakakka (Ma), Vazhukkumatti (Ta), Moli (Ka) |
| 5 | | Mesodesmaglabaratum | | Kakkamatti (Ta) |
| 6 | | Sunetta scripta | Marine clam | Kadal kakka (Ma) |
| 7 | | Donax spp. | Wedge clam | Mural, Vazhimatti (Ta) |
| 8 | | Geloina bengalensis | Big black clam | Kandan kakka (Ma) |
| 9 | | Anadaragranosa | Cockle | Aarippankakka (Ma) |
| 10 | | Placenta placenta | Windowpane oyster | |
| 11 | | Tridacna sp, Hippopushippopus | Giant clam | Kakka (Ma) |
| 12 | Mussel | Perna viridis | Green mussel | Kallumakkai, Kadukka (Ma), Pachali (Ka), Alichippalu (Te), Kakkai (Mr) |
| 13 | | Perna indica | Brown mussel | Kallumakkai, Kadukka (Ma) |
| 14 | Pearl oysters | Pinctada fucata | Indian pearl oyster | Muthu chippi, (Ma, Ta) |

| | | | | |
|----|----------------|--------------------------------|-------------------------|---|
| 15 | | <i>P. margaritifera</i> | Blacklip pearl oyster | Muthu chippi (Ma, Ta) |
| 16 | Edible oysters | <i>Crassostrea madrasensis</i> | Indian backwater oyster | Kadal muringa (Ma); Ali, Kalungu (Te) Patti (Ta), Muri (Ka) |
| 17 | | <i>Saccostrea cucullata</i> | Rock oyster | Kadal muringa (Ma); Ali, Kalungu, Patti (Ta) |

In India, studies on species diversity are very few (Gravelly, 1942; Satya murti, 1956; Appukuttan, 1972, 1980, 1989, 1996, 2008; Fred Pinn, 1990; Sakthivel and Fernando, 2002). The biodiversity can also be considered at other levels that of taxonomical organization at the level of the community or ecosystem (Zhang, 2011). The most frequently used quantitative measure of biodiversity is for a given area or a given community. Large scale biodiversity studies are rarely accomplished in marine tropical areas. Sustainable use of marine and coastal living resources cannot be properly established without an adequate knowledge of biodiversity. Ultimately, monitoring the biodiversity of a large ecosystem will allow a proper evaluation of the effects of natural and anthropogenic factors on species numbers, kinds and distribution.

The decline of oyster fisheries follows a common sequence of events in many places globally (MacKenzie et al. 1997a, 1997b, NRC 2004). Typically, the extensive harvest of wild oyster populations results in the loss of reef structure. Most declines start with the loss of vertical relief and complexity, often as a result of dredging and trawling, which exacerbates the impact of additional stresses from anoxia, sedimentation, disease, and nonnative species (Lenihan and Peterson 1998, 2004, Lenihan 1999, Lenihan et al. 1999). In many cases, years of declining harvest are followed by introductions of nonnative oysters that are released directly into the wild or that escape from nearby aquaculture (Ruesink et al. 2005). Overharvest and disease often lead to a population crash. Although oyster diseases occur in native populations, in many places the incidence of disease is associated with transfers of nonnative oysters for aquaculture and from ballast waters (NRC 2004). Other anthropogenic factors such as alterations of shorelines; changes in

| | | | | |
|----|----------------|--------------------------------|-------------------------|---|
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freshwater inflows; and increased loadings of sediments, nutrients, and toxins also contribute to declines (NRC 2004). There are few if any bays where only one stressor has affected oyster reefs.

Distribution and main culture areas of commercially important oyster species in India

| SPECIES | STATE | LOCALITY | NOTES |
|--------------------------------|----------------|--|---|
| <i>Crassostrea madrasensis</i> | West Bengal | | Little information available. |
| | Orissa | Bahuda estuary | Approximate area of 5 ha. Three distinct beds observed. |
| | Andhra Pradesh | Sarada estuary Bhimunipatnam | Oyster beds reported. Oyster beds subjected to annual depredation due to fresh water influx. |
| | | Upputeru canal | Approximate area of 2.25 ha of rich oyster beds. |
| | | Godavari and Krishna estuaries Gokulapalli | Low density beds. Rich oyster beds regularly exploited. |
| | Tamil Nadu | Pulicat Lake | Rich and extensive oyster beds regularly exploited. |
| | | Courtallayar and Adyar estuaries | Approximate area of 50 ha in each locality. Regular fishing occurs. |
| | | Mudasodai and Chinnavaykal Muthupet swamp Vaigai estuary | Small areas. Limited exploitation. Patchy settlements. Approximate area of 2 ha. No exploitation has been reported. |
| | | Tuticorin | Approximate area of 20 ha. |

| | | | |
|-------------------------------|-------------|---|--|
| | | | Exploitation occurs. |
| | | Tamparaparni estuary | Approximate area of 2.5 ha. No exploitation has been reported. |
| | Kerala | Ashtamudi Lake | Approximate area of 5 ha. Oysters are sparsely distributed & exploited. |
| | | Anchiengo backwaters | Highly populated oyster beds. |
| | Karnataka | Nethravathi, Kali & Sharavathi estuaries | Oyster beds of limited extent. |
| | | Venkatpur, Bhatkal, Mulky, Uppunda and Coondapoor estuaries | Oyster beds of same extent. Regular exploitation occurs. |
| <u>Crassostrea gryphoides</u> | Maharashtra | Dahanu creek, Mahim creek, Purnagab, Malwan, Alibag, Palghar, Satpuri, Boiser, Malad, Worli, Ratnagiri, Jaytapur, Versova, Gobbunder, Cuff Parade, Marve, Madh and Bandra | Oyster beds of same extent. Regular exploitation occurs. |
| | | Utsali, Navapur and Kelwa | Oyster beds of same extent. Bottom culture is practiced. |
| | Goa | Ribanden, Siolim and Curca | Oyster settlements reported. |
| <u>Crassostrea rivularis</u> | Gujarat | Aramra, Poshetra, Port Okha, Porbander, Sikka, Gagwa creek, Singach creek, Beet | Oyster beds of same extent. Regular exploitation occurs. |

| | | | |
|----------------------------|-------------|--|--|
| | | Kada, Khanara creek, Laku Point, Gomati creek, Navibandar, Harsad, Balapur and Azad island | |
| | Maharashtra | Mahim, Ratnagiri and Jaytapur areas | This species is found along with <i>C. gryphoides</i> . |
| <u>Saccostreacucullata</u> | Maharashtra | All along the coast | Oyster beds of same extent. Regular exploitation occurs. |
| | Gujarat | All along the coast | Oyster beds of same extent. Regular exploitation occurs. |

The major threats to the biodiversity of oysters are:

1. Extension of agriculture in the vicinity of lakes and over-utilization of water for irrigating the fields, causing decrease in the water levels, thus causing problems to the biotic components.
2. Filling up of many lakes and encroachment of lake area for urban extensions have resulted in habitat destruction, wiped out the biotic members.
3. Agro-chemical run-off, sometimes having toxic chemicals from surrounding fields causing danger to life of aquatic organisms.
4. Unscientific activities in the catchment's area, causing excessive siltation, habitat destruction, thus posing threat to the life contained in it.
5. Flow of untreated sewage containing domestic wastes and discharge of polluted water has been another cause for reduction and elimination of population of sensitive species.
6. Uncontrolled commercial exploitation of species has endangered the species diversity, many becoming vulnerable and rare.
7. Introduction of non-native (exotic) species, especially for fish culture, has caused a decline of many endemic fish species, thus threatening the species richness.

Conclusion:

People should develop and adopt new, more ecologically sustainable and socially useful approaches that sustain 'inter-generational equity'. The present and the future generation must strive to use resources and achieve comforts from the aquatic ecosystem systems, that is equitably distributed and within the limits of the natural systems. To achieve any form of economic development with minimum damage to the aquatic ecosystem structure, one needs to plan and implement those steps and procedures that are environmentally friendly, avoid any actions that happens to degrade it, and at the same time sustain its development. The quality of future life, especially of the future generation depends to a great extent on the present sustainable use and development of the oyster resources from such aquatic systems.

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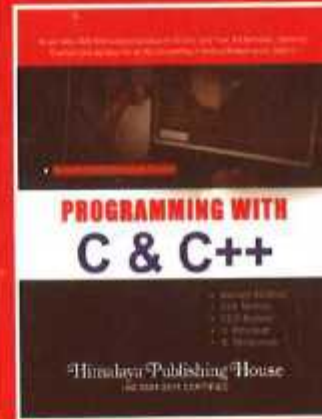
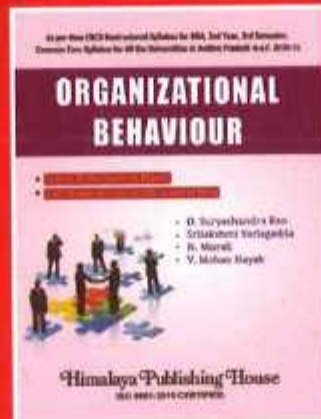
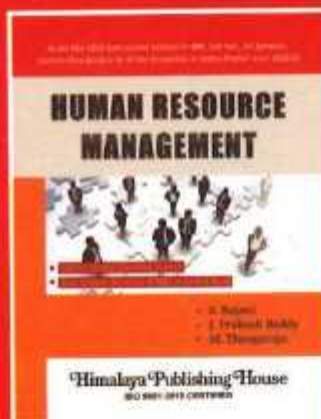
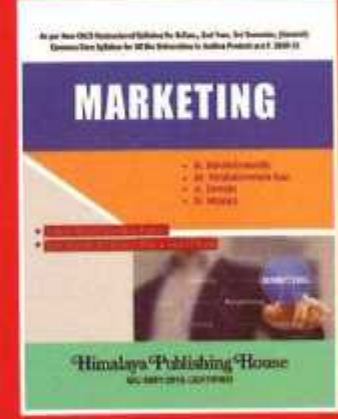
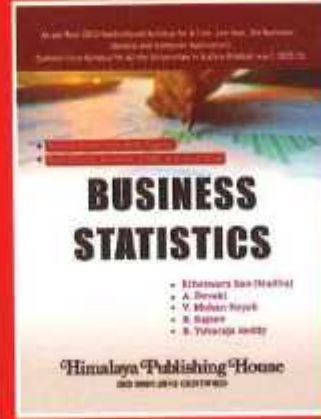
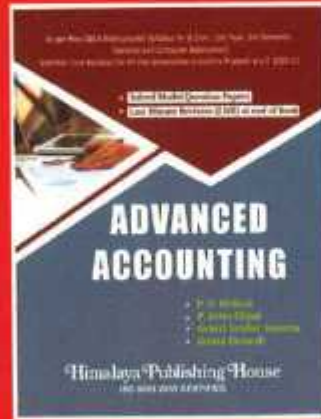
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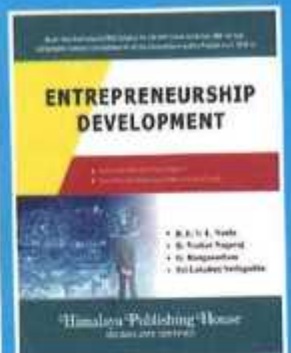
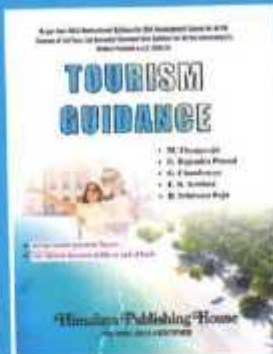
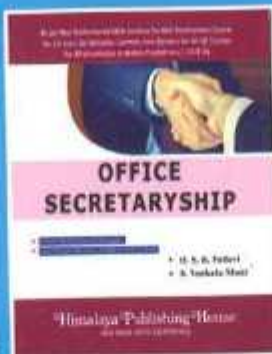
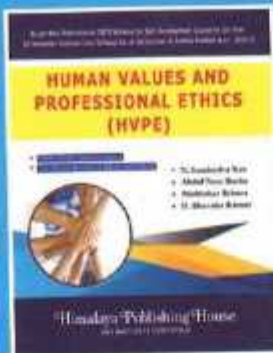
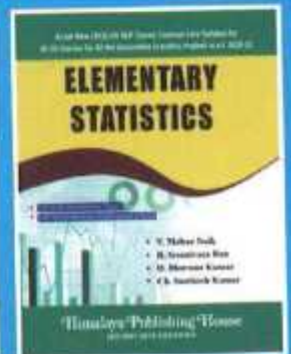
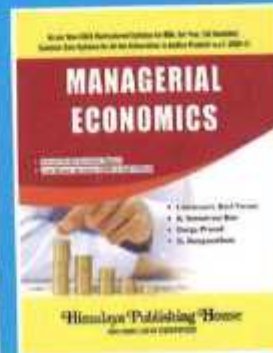
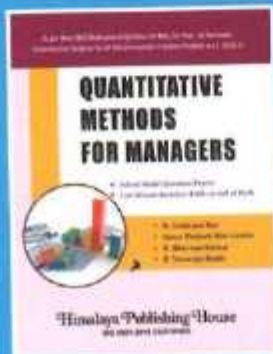
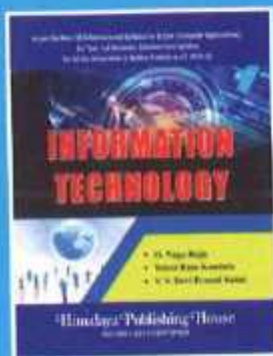
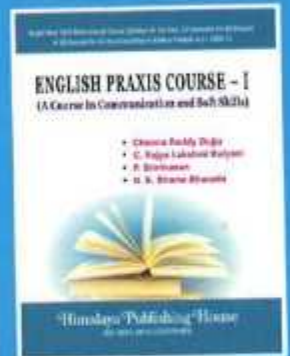
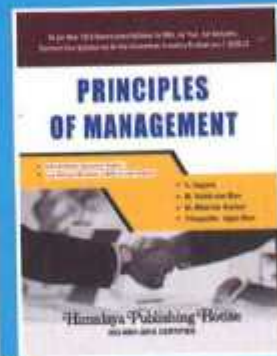
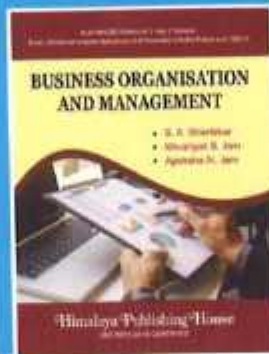
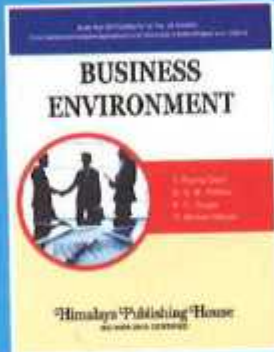
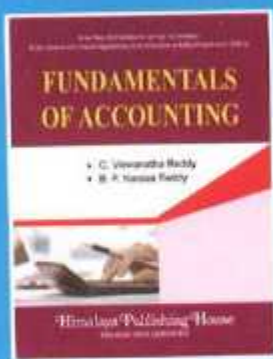
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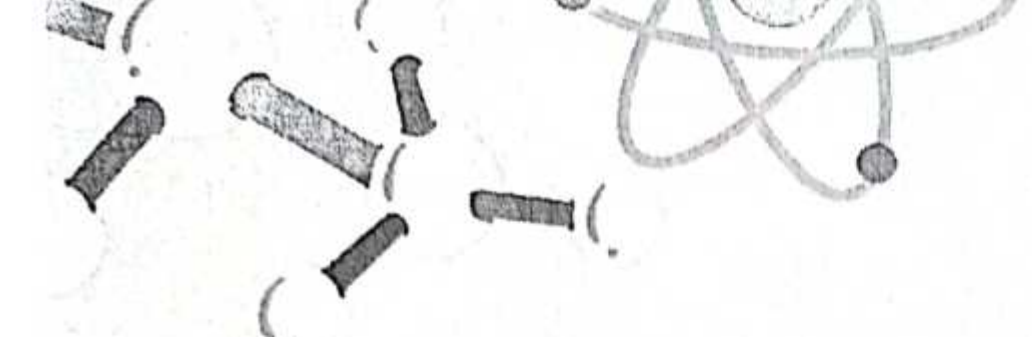
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Phytochemical analysis of bioactive compounds from plant extracts of *Caralluma procumbens* using FTIR, GC/MS, HPLC techniques

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Abstract

The use of plants in the traditional medicine has been inherited from earlier generations and has become an integral element of the preventive and prognostic health care system. A great deal of research is under progress to understand, identify, isolate and modify potential biological and therapeutic compounds from natural resources such as plants. *Caralluma procumbens* belongs to Apocyanaceae family. The present study was carried out to characterize the bioactive components present in *Caralluma procumbens* using preliminary phytochemical screening, such as GC/MS, FTIR and HPLC. The results of the GC/MS analysis of methanolic plant extract reveal different peaks determining the presence of 7 phytochemical compounds with various therapeutic properties. The major phytoconstituents identified were Urs-12-en-24-oic acid, 3-oxo-, methyl ester(53.93%), α -Amyrin(14.06%), ζ -Sitosterol (9.77%), Stigmasterol (7.40%), Campesterol (7.40%), Squalene(5.20), Bufa-20,22-dienolide, 3,14-dihydroxy-, (3 \acute{a} ,5 \acute{a})-(2.24%). The results demonstrate that important bioactive compounds are present in plant extract and these constituents could be responsible for various endogenous pharmacological activities. The Fourier transform infra-red (FTIR) spectrum of *C.procumbens* plant extract confirmed the presence of alcohols, aldehyde, phenols, alkanes, alkenes, carbonyl, aromatic amines, carboxylic acids and aromatic compounds in extract. HPLC profiles of *Caralluma procumbens* was found to possess four phenolic compounds, namely Tannic acid (2.40 min), Resorcinol (2.86 min), Catechol (3.55 min), and Ellagic acid (4.36 min). The results of GC/MS, FTIR, HPLC analysis provide the herbal medicines as an alternative choice to the conventional strategies that are being used. Hence, the current study lays foundation that could lead to development of novel drug molecules using *Caralluma procumbens* and may have broad range targets such as antimicrobial and anticancer agent.

Key words: GC/MS, HPLC, FTIR, *Caralluma procumbens*.