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Assessment of Development of Indian Sundarbans: A Multivariate Approach

Karabi Das

Assistant Professor, Department of Geography, Dr. Kanailal Bhattacharyya College, WB, India

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Abstract

Finding the status of development of an area is an important way to assess the changes in society and development. For this, a multivariate approach was employed using parameters on education, health and transportation. Assimilating these variables after normalization the Maziotta - Pareto Index has been used to find the ranking of blocks of the Indian Sundarban with respect to these indicators of development for 2003 and 2013. Maziotta - Pareto Index is an adequate measure of development and starts from a linear aggregation and introduces penalties for the geographical areas with 'unbalanced' values of the indicators. Physiographically, the region is a deltaic plain, having an intricate network of creeks and is annually ravaged by the natural hazards, e.g., Bay Depressions. The inhabitants of Sundarban are primarily involved in agriculture (monocropping due to increased salinity), aquaculture and collection of non timber forest products and thus do not have adequate income to support their families. The current article employs this technique along with questionnaire surveys in selected sites of the study area to assess the changes in socio-economic development of the Indian Sundarban.

Introduction

Economic development is connoted as the process through which any nation improves the economic, political and social well being of its citizens. While economic growth deals with increase in the level of output, economic development is related to increase in output along with improvement in social and political welfare of people in a country. The process of social and economic development, also called socio economic development is measured with indicators ranging from GDP, life expectancy, literacy and levels of employment.

Objectives

The objectives of the study are as follows:

i) To identify the various hazards and hindrances in the way of development of the Indian Sundarban
2) To assess the present status of development of the community development blocks of Indian Sundarban
3) To study the attempts of various organizations in the way of development of Indian Sundarban

Methodology

The study was carried out based on secondary data. The data on various parameters were collected from the District Statistical Handbooks of both North and South 24 Parganas for the years 2003 and 2013. The indicators used were Mouzas electrified (%), mouzas with safe drinking water (%), total literacy rate (%), total number of primary health centres, total number of schools, total cases of immunization, total number of beds, total number of doctors, total number of cases treated, total number of family welfare centres, total number of workers, total number of banks, total number of co operative societies, population served by banks ('000), total length of surfaced roads (km), total number of ferries, total number of bus routes, and distance of nearest railway station from block headquarters (km).

The data were first tabulated and then the Maziotta - Pareto Index was computed as:

The development measure, $MPI_i = M_i - S_i cv_i$

Here, the mean of the standardized values is adjusted subtracting a quantity proportional to the standard deviation and direct function of the co efficient of variation. The higher the index the higher is the development of the region. The index assumes high value when the mean is high and standard deviation is low (Maziotta & Pareto, 2007). Based on the index, the community development blocks were ranked from 1 to 19 both for 2003 and 2013. A correlation of the development scores was also found out. Also, data from MNREGA were taken to depict the performance of this

MJMR

VARIATIONS IN COLONIZATION AND SUCCESSION PATTERN OF DIPTERAN FLIES OF FORENSIC IMPORTANCE ON INDIAN MOLE-RAT CARCASSES IN URBAN AND SUBURBAN LOCALITIES OF KOLKATA, WEST BENGAL: IMPLICATIONS IN CORPSE RELOCATION STUDIES.

Garima Hore[1,*], Panchanan Parui[1], Goutam Kumar Saha[2], Dhriti Banerjee[1]

[1]*Diptera Section, Zoological Survey of India, Government of India, Ministry of Environment, Forest and Climate Change, Kolkata, India*
[2]*Department of Zoology, University of Calcutta, Kolkata, India*

**Corresponding Author Email: garimahore@gmail.com*

ABSTRACT

Necrophagous diptera form the first wave of arthropod colonization of carrion, facilitating microbial decomposition and helping maintain the balance of the ecosystem, thus are of considerable importance both from ecological and forensic entomological perspective. The present study indicates the difference in dipteran species composition and its succession patterns observed in colonising Indian mole-rat (*Bandicota bengalensis*) carcasses in two different localities, an urban and a suburban region of Kolkata and its adjoining areas in West Bengal during the month of April. It was observed that from the urban locality, a total of eight dipteran species belonging to three different families were recorded from the rat carrion, whereas, six dipteran species from four families were recorded from the suburban region. Moreover, in the urban habitat, it was noticed that the muscids were the predominant colonizers both with respect to species richness, abundance and frequency of colonization. The suburban area showed overall uniformity in terms of species richness and abundance in all the families. The two carcasses were seen to differ in dipteran succession patterns as well, with muscids, *Synthesiomyia nudiseta* being the first and *Atherigona orientalis*, the last to colonize in the urban region, in contrast to the suburban region with *Chrysomya rufifacies* (Calliphoridae), the first and *Megaselia scalaris* (Phoridae), the last species to colonize the carcass. *Synthesiomyia nudiseta* and *Chrysomya rufifacies* were the most abundant species found in the urban and suburban areas respectively. The study, first of its kind in India, will aid in future studies on carrion ecology and forensic entomological research of this region.

Keywords: Diptera, Carcass, Forensic entomology, Succession.

INTRODUCTION

Necrophagy is the act of feeding on dead or decaying animal flesh. Decaying carrion provides a transient, rapidly changing resource which supports a large, dynamic fly community thus aiding in estimation of PMI and criminal forensic investigations. Necrophagous insects, often called carrion insects, are key players in the decomposition process which is associated with decaying human and animal remains and utilized by insects as their micro-niches, thus, forming diverse micro-communities (Allee *et al.* 1949; Kuusela and Hanski, 1982). Necrophagous dipterans are the initial wave of insects to colonize carcasses, commencing the process of decomposition. Though the adults feed on the fluids of the corpse, the larvae are the true decomposing organisms, secreting enzymes directly into the carrion and helping with the liquefaction of the corpse tissues while assisting the increase of microbial activity, thus playing a crucial role in nutrient cycling and maintaining

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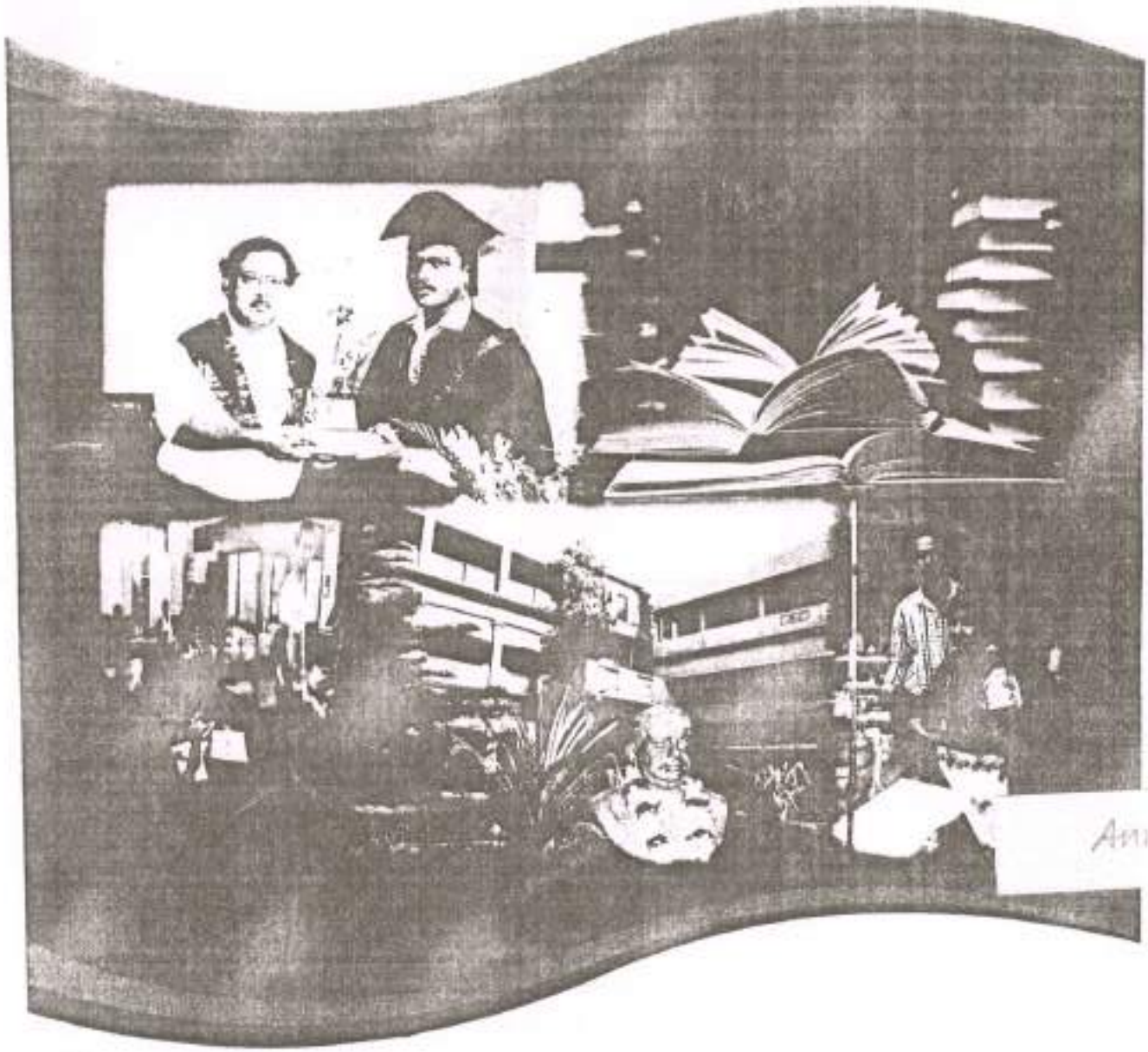

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Indian Women and Financial literacy– A Way Forward

Srabani Dey
Assistant Professor in Commerce
Dr. Kanailal Bhattacharyya College
Email: contactsrabanideymphil@yahoo.com

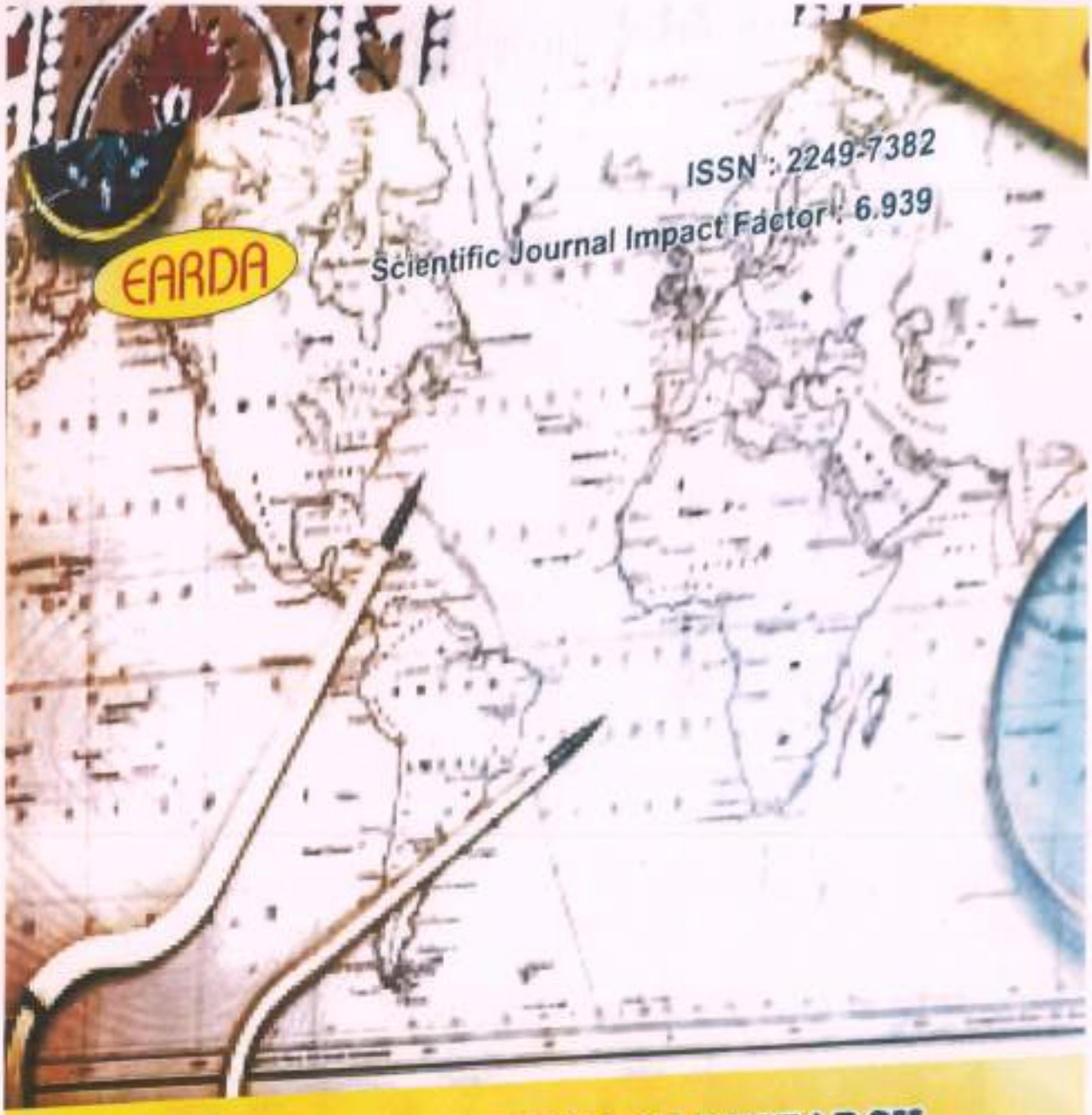
Abstract

With the beginning of various financial and economic reforms, the scope of whole market is getting extensive/broad. Several new financial products are being introduced in the market that is generating the need for individuals to plan and invest their finances tactfully. In other words, economic planning is becoming essential for financial well being of an individual. While on the one hand, the role of financial planning is largely acknowledged, on the other hand the significance of financial literacy is still lagging behind, especially for women. Furthermore, the level of financial literacy among the Indian women has not been mostly recorded. Hence, the need arises to understand in detail the issue of financial literacy among women in India. This paper is an attempt in this direction. It has been noticed that although it is necessary that women should be given equal power to take financial decisions as taken by men, yet many Indian women are facing various cultural, financial, psychological and physical barriers that are generating obstacles in becoming financially literate. The government is taking inventiveness for making the people more financially literate, yet there persists a lot of gap in the financial literacy level of men and women. Hence, more women specific financial literacy programs should be introduced and new universities should be established to make the women more literate. This would not only make the women more independent and empowered but would facilitate the growth of the whole nation.

Keywords: Financial Planning, financial literacy, financial inclusion, financial empowerment.

I. Introduction

India represents the fastest growing region in the global economy. More than half of the populations in our country are woman. The participation of women in the economy would therefore not only increase their own economic well being but would also give towards raising further the economic prospects of country. Women are already engaged in both the formal and non formal sectors and are increasingly emerging as a more important force in the economy. Financial literacy among woman becomes an important part of this process, regardless of the income constituency to which they belong. There needs to be a better



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A STUDY OF ANITA DESAI'S NARRATIVE TECHNIQUE IN *JOURNEY TO ITHACA*

Swati Mustaphi

Assistant Professor, Department of English

Dr. Kanailal Bhattacharya College, Howrah -711104

ABSTRACT

Anita Desai's narrative method, which is the primary focus of study here, employs the antithetical technique. In this technique, Desai skillfully compares and contrasts the two worlds – the inner world of her protagonists and the outer world of the rest of the characters.

The objects, scenes, characters, all exist in the novel as image figures to objectify and dramatize the protagonists' point of view. Desai's creation of meaningful images serves the purpose of making the abstract concrete. Her images and image scenes serve as formal analogues for a private world. The purpose of the present study is to analyses her technique – point of view, use of images, rhetoric and the special importance she lays on nature.

Since the early days of European colonial expansion India has continued to fascinate the Western mind, either as materially alluring, or as imaginatively enhancing with its exotic culture and natural beauty, or as spiritual succor for the soul satiated by excessive material accumulation. It may be interesting to note how the motif of journey appears to have dominated major literary works on the theme of India. A Passage to India and The Razor's Edge are some of the major examples. Journey motif as archetype appears to reflect a universal mental pattern that has been operating since the days of primitive society and is expected to continue as a recurring narrative design in the journey motif in her novel ***Journey to Ithaca*** **(1995).**

Making a departure from the Desai canon, ***Journey to Ithaca*** introduces a different style and a different subject than what has kept the author preoccupied so far. No questions of feminism, identity or racial problems seem to surface here or even the intricacies of personal relationships, which is her forte. What keeps the author preoccupied here is the idea of a persistent journey, something like the concept of 'ananta yatra' that is predominant in Indian Philosophy. In a way, ***Journey to Ithaca*** may be described as a story of multiple journeys undertaken by many people at

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THE THEME OF ALIENATION IN ANITA DESAI'S *BAUMGARTNER'S BOMBAY*

Swati Mustaphi

Assistant Professor, Department of English

Dr. Kanailal Bhattacharya College, Howrah-711104

ABSTRACT

Baumgartner's Bombay is a moving account of a homeless, nationless man. He has nowhere to go to, retain his lost identity. He is the same in his native soil and the alien one, an outsider, a nowhere man in every sense. Baumgartner or Hugo is literally an exile driven out of Germany due to racial discrimination, to start a new life in the friendless, unfamiliar India. Identity is a state of mind that is granted by our acceptance in the society. The problems consequent on alienation, immigration or expatriation is to be best understood in the light of the two related yet contradictory terms 'exile' and 'home'. "Home' is not merely the habitual abode; it is where one belongs to, that which gives one cultural and spiritual identity. It is one's native soil, mother country and security, which become part of one's self. 'Exile' is enforced or regretted absence from one's country or home. Literally, it means an uprooting where the mind and spirit suffers from the deprivation of sustenance it has drawn from the native soil. By focusing on Baumgartner, the dispossessed Jew, first in the twilight years of the Empire and then in postcolonial times, Desai has offered a damning indictment of not just Nazism and colonialism but also of postcolonial India, which practices its own marginalization of its economically disadvantaged sections and its ethnic, religious and regional minorities.

KEYWORDS: exile, home, alienation, marginalization.

The theme of exile, immigration and alienation is common in the twentieth century literary scene. Political, cultural, social, economical and geographical dislocations have made each man an exile. Cultural alienation has become a universal phenomenon. The *Book of Genesis* tells the story of alienation and exile. Adam and Eve were alienated from the grace of God and banished from their home, the Garden of Eden, to labour by the sweat of their brows. Ever since, exile, exodus and migration have been the fate of man. Whatever the reason for migration, the impact of cultural

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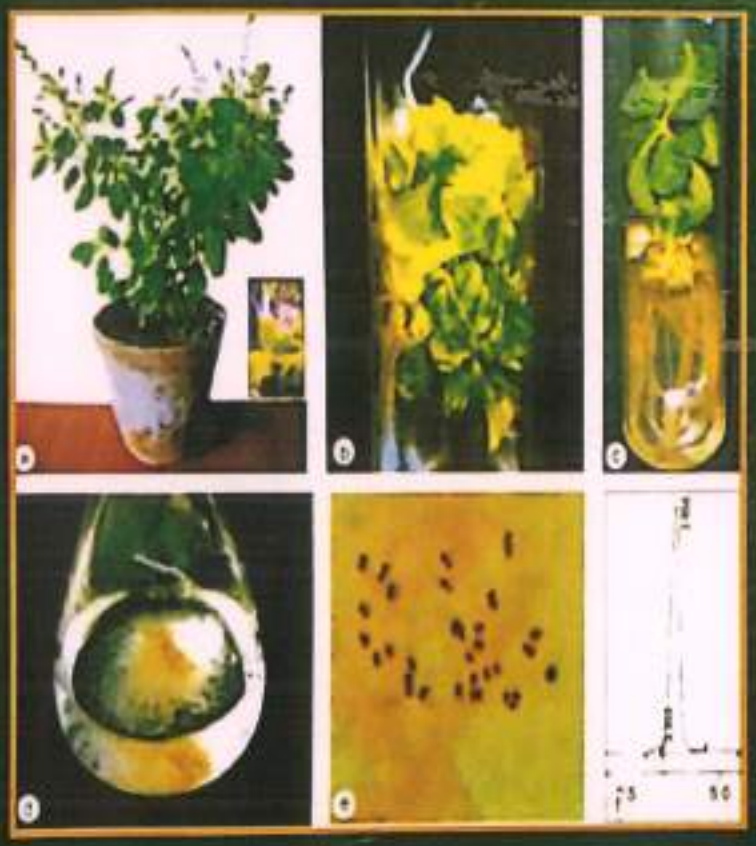

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Taraknath Palit Siksha Prangan,
35, Ballygunge Circular Road, Kolkata 700 019, India

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Morphological characterization and somatic chromosome number determination in five populations of *Sphagneticola calendulacea* (L.) Pruski.

Sagarika Lahiri, Kotisree Lahiri[1], Dipu Samanta and Sandip Mukhopadhyay*
Centre of Advanced Study, Department of Botany, University of Calcutta,
35, Ballygunge Circular Road, Kolkata-700019, India.
[1] Present Address: Department of Botany, Vidyasagar College, 39, Sankar Ghosh Lane, Kolkata 700006, India

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Sphagneticola calendulacea (L.) Pruski commonly known as 'mahavringaraj' of Asteraceae is an important medicinal plant distributed throughout the tropical and coastal countries. A detailed morphological analysis was carried out on five different populations of *Sphagneticola calendulacea*. In the present study, leaf area, internode length, floral characteristics, stomata frequency, pollen morphology and determination of somatic chromosome number in different population of *Sphagneticola calendulacea* (L.) Pruski have been investigated. Morphological characters differed among these populations to a certain extent. Leaf and floral morphology show variation among these populations to a great extent. Anomocytic and anisocytic types of stomata have been observed in all these populations. The average number of stomata in upper and lower surface of both mature and immature leaves has been higher in population I and IV respectively. Echinolophate type of pollens was observed in all these populations. Highest percentage of viable pollen has been observed in population IV. Cytological analysis reveals varied somatic chromosome number in these populations [2n=50 (population I to III), 2n=52 (population IV) and 2n=54 chromosomes (population V)]. The control of different morphological features might have been associated with genetic factors and can be utilized as parameters to identify the superior genotype for its propagation and conservation through culture.

Key words: Chromosome number, Morphology, Population, *Sphagneticola calendulacea*.

INTRODUCTION

Plant morphology has been a major characteristic parameter for classification of different taxa. The taxonomist mostly relies on the morphological characteristics as these are easily visible and can be used conventionally in classification of plants. The floral morphology has mostly been used as the major criterion for classification, though the different morphological characters like leaves, internodal length, seedling morphology and others are used along with the floral morphology (Singh, 1999; Paria and Chinya, 2002; Nomani *et al.*, 2013; Mukhopadhyay *et al.*, 2015). In the present day micromorphological characters like pollen, stomata and trichomes are utilized in classification of plants in different groups.

Sphagneticola calendulacea (L.) Pruski of Asteraceae is an important medicinal plant distributed throughout the tropical and coastal regions in India, Bangladesh, China, Japan, Malay Peninsula, Sri Lanka (Hajra *et al.*, 1995). In India this plant is commonly known as 'mahavringaraj'. The plant is a procumbent, perennial herb with solitary terminally or axillary heterogamous capitulum. The plant has a luxuriant growth with camphor like aroma.

This is an important medicinal plant used in traditional medicine as well as for other purposes. It contains alkaloids, flavonoids, sterols, glycosides, saponin, isoflavonoids and wedelolactone (Govindchari *et al.*,

*Corresponding author email: sandip135@yahoo.com

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Anita Desai's *Fasting, Feasting*: A Study in Contrasts

Swati Mustaphi

Assistant Professor, Department of English, Dr. Kanailal Bhattacharya College, Howrah, West Bengal, India

Abstract: *The present research critiques the use of contrasts in* ***Fasting, Feasting*** *by Anita Desai. A close analysis of the novel clearly reveals that Desai projects contrasts, a literary device to depict marginalizations of several types through the themes like gender discrimination, marriage failures, isolation and loneliness due to the adverse situation in the family, survival strategies, domestic violence to the newly married young girls overpowering patriarchal forces, East-West confrontation etc. Desai's role as an artist is not to provide solutions to social problems but to raise issues deep in their implications so that society can think of solutions in the long run.*

The suggestive title of the novel *Fasting,Feasting* (1999) is loaded with meaning, the comma splitting it into two halves. Apparently, it appears to deal with starvation versus gluttony, plenty versus scarcity, and though food together with its physical consumption does figure prominently in the second half of the book, the meaning goes much deeper. Once again, the comma, splitting the title gives an idea of the structure of the novel. The book is divided into two, though unequal parts. The first part portraying the life of a sufficiently well – off middle class family in the late fifties and early sixties:

Mama had been born to a merchant family in the city of Kanpur...Papa, in Patna, the son of a tax inspector ...This much the children learnt chiefly from old photographs, framed certificates, tarnished medals and the conversation of visiting relatives. Mama Papa themselves rarely spoke of a time when there were not one. The few anecdotes they related separately acquired great significance because of their rarity, their singularity. (Desai 5)

A family that has daily routine rigidly worked out and adhered to, and any sort of aberrations in it are unwelcome; where the word is law, where every dissenting voice is immediately squashed. The second part takes us directly to the USA in Massachusetts to the family of the Pattons where frankness is the word. The cultures of the east and west are cleverly juxtaposed, and when one reads the second part one cannot help casting a backward glance at the first.

A sketch that stands out sharply in the opening pages of the books is the merging of the identities of the two parents into one. To Uma the words Mama Papa and Papa Mama are inseparable: "It was hard to believe they had ever had separate existences, that they had been separate entities and not Mama Papa in one breath" (Desai 5). Mama is forever Papa's effortless accessory. Content with each other, they sit "joined together in their Siamese twin existence" On the creaking sofa-swing on the verandah, legs dangling, eyes hooded, occasionally talking to each other, or simply dozing off when thoughts and words ran out, but always "presenting the same undecipherable face to the world" (Desai 13).

Desai's art beautifully balances the opposites. Sometimes even a single sentence – and there are quite a few of them – is loaded with the juxtaposition of contraries. The loneliness of the slow – witted, "pumpkin head", almost half – forgotten Uma, is at the heart of the novel. In the opening sentence of a chapter, "Uma is alone. Mama Papa have gone to the club to play bridge"(Desai 98). It is the only time of leisure she has to herself, the rest of the day she is carrying out orders for others to keep things running in the household. Uma is mentally bracketed by her parents with ayah who does the "top work." One sentence underlines the meanness of the father, "Papa thinks these could be done by Uma at a saving"(Desai 36)

The contrast becomes more vivid in the question of education. From the time of Arun's birth it is decided that Uma no longer needs to go school. Classes are over for her but the abiding impression Uma has of her brother's childhood is just one word, 'education.' There is a "maniac determination" in Papa to see him doing well in studies. At the end of a grueling day, the child shuffles off to his room "with the gait of a broken old man" The way Papa drives Arun makes Uma wonder, "Was he fulfilling through Arun a dream he had there under the streetlights, or in the shabby districts courts?"(Desai121). So Arun is to be sent abroad for studies; yet, when the letter of acceptance from America came, "he held his hips tightly together... not the hint of a smile, laugh or anything; these had all been ground down till they had disappeared" (Desai 121). He blankly stared at the letter is he "faced another phase of his existence arranged for him by Papa. "Uma, highly sensitive can visualize "the deep well of greyness that was his actual existence" (Desai 121). She longs to stir up that viscous, to bring to life some evidence of colour, if not in her life, then in another's. Of course, Arun paid scant attention to her, but as he boards the train for Bombay, he looks back at her and "suddenly noticed

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MARRIAGE AND FAMILY RELATED ISSUES OF RURAL WOMEN : A STUDY IN HOWRAH DISTRICT, WEST BENGAL

Sutapa Pal* and Snehamanju Basu**

Abstract

Marriage is an institution which admits men and women to family life. It is a stable relationship in which a man and a woman are socially permitted to have children implying the right to sexual relations. Marriage in India is a holy performance of religious duties. Age of marriage greatly influences quality of life of a woman. Early marriage is a common problem in rural areas mainly caused by poverty, dowry and bride price. Selection of partners, system of dowry, husband-wife relations, preference for divorce are highlighted here as marriage related issues. Family is socially recognised unit of people related to each other by kinship and martial legal tie. Freedom of mobility, freedom of speech, son preference in the family, access and control over resources and decision making pattern of rural women in some selected villages in Haora district have been discussed in this paper by analysing some primary data with proper statistical tecniques.

Introduction

Marriage is a socially or ritually recognised union or legal contract between spouses that establishes rights and obligations between them and their children and between them and their in-laws as well as society in general. Marriage is a public confession and legal registration of an adventure in fellowship. Marriage consists of the rules and regulations which define rights and duties and privileges of husband and wife with respect to each other. Marriage can be defined as a socially sanctioned union of male and female or as a secondary institution devised by society to sanction the union and mating of male and female for purposes of establishing a household , entering into sex relations, procreating and proving care for the off-spring."A family comes into existence when a man and a woman establish mating relation between them. Family is a fundamental unit of human society. Family is the most universal group. The family is guarded by social custom and legal regulations. Family as an institution is permanent and universal while as an association it is temporary and transitional.Family is a group of persons united by the ties of marriage, blood or adoption, consisting of a single household, interacting and intercommunicating with each other in their respective social roles of husband and wife, mother and father, son and daughter and sister creating a common culture."In rural areas marriage and family related normative issues can largely influence the quality of life of women. Age of marriage, system of dowry, selection of life partners, decision making power, access and control over economic resources, husband wife relations, preference for divorce of the rural women are the main highlighting issues in this paper.

Objectives

1. To show husband-wife relationship affecting their quality of life.
2. To highlight the domestic violence of rural women related to dowry.
3. To discuss the age of marriage affecting the quality of life of rural women.

**Smt. Sutapa Pal, Assistant Professor,Dr.Kanailal Bhattacharyya College, Email: sutapa2010@live.co.uk*

***Dr. Snehamanju Basu, Associate Professor, Lady Brabourne College, Email:drsnehamanju@gmail.com*

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Liposomal Elongation Factor-1α Triggers Effector CD4 and CD8 T Cells for Induction of Long-Lasting Protective Immunity against Visceral Leishmaniasis

*Abdus Sabur[†], Sudipta Bhowmick[†,‡], Rudra Chhajer, Sarfaraz Ahmad Ejazi, Nicky Didwania, Mohammad Asad, Anirban Bhattacharyya, Utsa Sinha and Nahid Ali**

Infectious Diseases and Immunology Division, CSIR-Indian Institute of Chemical Biology, Kolkata, India

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***Correspondence:**
Nahid Ali
nali@iicb.res.in,
nahidacl28@yahoo.in

‡Present address:
Sudipta Bhowmick,
Dr. Kanailal Bhattacharyya College, Howrah, West Bengal, India

†These authors have contributed equally to this work.

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Despite advances, identification and formulation of safe and effective vaccine for long-lasting protection against leishmaniasis is still inadequate. In this study, we have identified a novel antigen, leishmanial elongation factor-1α (EF1-α), as an immunodominant component of solubilized leishmanial membrane antigens that reacts with visceral leishmaniasis (VL) sera and induces cellular proliferative and cytokine response in PBMCs of cured VL subjects. Leishmanial EF1-α is a 50 kDa antigen that plays a crucial role in pathogen survival by regulating oxidative burst in the host phagocytes. Previously, immunodominant truncated forms of EF1-α from different species of *Leishmania* have been reported. Formulation of the *L. donovani* 36 kDa truncated as well as the cloned recombinant EF1-α in cationic liposomes induce strong resistance to parasitic burden in liver and spleen of BALB/c mice through induction of DTH and a IL-10 and TGF-β suppressed mixed Th1/Th2 cytokine responses. Multiparametric analysis of splenocytes for generation of antigen-specific IFN-γ, IL2, and TNF-α producing lymphocytes indicate that cationic liposome facilitates expansion of both $CD4^+$ as well as $CD8^+$ memory and effector T cells. Liposomal EF1-α is a novel and potent vaccine formulation against VL that imparts long-term protective responses. Moreover, the flexibility of this formulation opens up the scope to combine additional adjuvants and epitope selected antigens for use in other disease forms also.

Keywords: visceral leishmaniasis, cationic liposome, vaccine, elongation factor-1α, Th1/Th2 response

INTRODUCTION

The most serious form of leishmaniasis is caused by visceralizing parasites belonging to *Leishmania donovani* complex. The disease is characterized by severe manifestations, such as hepatosplenomegaly, fever, pancytopenia, hypergammaglobulinemia, immune suppression, and death without appropriate treatment (1). Antileishmanial chemotherapies are long, expensive, and have adverse side effects. This compounded with the emergence of drug-resistant strains and increased HIV co-infection in developing countries underscore the need for an effective and safe vaccine (2).

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Protein and isozyme analysis in different species, varieties and populations of *Tabernaemontana*

*** Dipu Samanta, Sandip Mukhopadhyay**
Centre of Advanced Study, Department of Botany, University of Calcutta, Kolkata, West Bengal, India

Abstract
Tabernaemontana is a member of Apocynaceae. Approximately 100 species of this genus are widely distributed in tropical parts of the world. Phytochemical studies revealed that in *T. coronaria* 66 different alkaloids have been identified from different parts. 22 types of alkaloids have been isolated from root and bark of *T. dichotoma*. The present investigation includes total protein analysis and study of isozyme activities showing distinct variations. Total protein analysis, both quatitative and qualitative, showed significant variations. Two isozymes indicated variations at species and variety levels. Proteins and isozymes are significant and widely used to study genetic diversity at interspecific and intraspecific levels. The number and position of isozyme bands differed in two species of *Tabernaemontana* and three varieties of *T. coronaria*. The differential distribution of both esterase and peroxidase activities has revealed genomic diversity among the species and varieties of *Tabernaemontana*. The differences among the populations are very low indicating their vegetative propagation.

Keywords: dendogram, isozyme, protein, *Tabernaemontana*

Introduction

Tabernaemontana (synonym- *Ervatamia*) belongs to the family Apocynaceae, subfamily Plumeroidae and tribe Tabermontanae. An approximately 100 species of *Tabernaemontana* are widely distributed in tropical countries in wild condition including India as a garden plant. The plant is medicinally important with anti-ulcer, anti-bacterial and anti-inflammatory properties and is also used as antihelmintic, antihypertensive, diuretic, hair growth promoter, purgative and many other illnesses [1, 2]. This genus is important as a natural synthesizer of different alkaloids including many indole alkaloids. Phytochemical studies on various parts of this plant reveal that it contains at least 66 indole alkaloids, non- alkaloid constituents like enzymes, flavonoids, hydrocarbons, phenolic acids, phenyl propanoids, steroids and terpenoids. The bark and leaf of *T. dichotoma* are purgative. *T dichotoma* is used in healing of wounds caused by snake bites and bites of centipedes [3].

The species, varieties and populations of *Tabernaemontana* considered in the present investigation reflected their individuality by their morphological differences [4, 5] (Fig. 1). The somatic chromosome number was found to be 2n =2x = 22 chromosomes in *T. dichotoma* [6, 7, 8, 9] and other varieties and populations of *T. coronaria* except *T. coronaria* var. *florepleno* where it was 3n = 3x = 33 chromosomes [10]. Karyotypic details revealed cryptic structural alteration of chromosomes that led to the possession of distinct different karyopypes in each species and varieties.

The growth and development of plant cells involve changes in different biochemical contents bringing about diversification and specialized characteristics of different multicellular organs. With the progression of cellular differentiation there is continuous synthesis of and/ or degradation of specific structural proteins and enzymes which results in morphological and anatomical development and functional specialization of a particular tissue as well [11]. Both qualitative and qualitative changes in various proteins may occur during maturation of cells.

The species and populations of a particular plant can be characterized by their protein profile and specific isozyme activities at specific period of growth and development. In protein analysis polyacrylamide gel electrophoresis (PAGE) is an important and useful analytical tool for separation and quantification of specific polypeptides. It is a method of choice for locating any qualitative changes in protein metabolism at the cellular or tissue level [12, 13, 14]. The unique advantage of this process is that a mixture of polypeptides can be separated and visualized permitting estimation of different polypeptide contents. The PAGE technique has been successfully utilized for separation of both plant proteins and isozymes from both *in vivo* and *in vitro* conditions [15, 16, 17].

The isozymes played a significant role in plant biochemistry research when genetic polymorphisms for isozymes within the same populations were observed [18]. Isozymes have proven to be reliable marker for studying systematics, genetics, breeding and interrelationship of a group of plants. The activity of isozymes has also been utilized as a suitable marker during plant cell growth and development *in vitro* [19, 20]. There are different isozymes found in plant system of which esterase and peroxidase are used to identify different cultivars including somaclones developed against biotic and abiotic stress tolerance. Esterase belonging to the class hydrolase, involves esterification. Peroxidase, on the other hand, accelerates the reaction of hydrogen peroxide, a toxic metabolic product of cell, to form water and oxygen. In absence of peroxidase this reaction occurs spontaneously with slow rate.

The present biochemical investigation was undertaken to find

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Sensory organs of forensically important fly *Ophyra capensis* (Wiedemann, 1818) (Diptera: Muscidae): A scanning electron microscopic study

Garima Hore [a], [b], Goutam Kumar Saha [a], Dhriti Banerjee [a]

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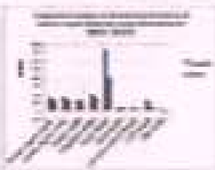
Abstract

Dipterans, especially the necrosaprophagous communities are of substantial importance from medical, veterinary and forensic entomological perspectives. Muscids are generally seen to colonize carcasses at advanced stages of decomposition when the initial dominance of calliphorids and sarcophagids subsides. *Ophyra capensis* (Wiedemann, 1818), a muscid fly with a relatively wide distribution range is considered of decent forensic relevance as it has been reported not only from cadavers placed outdoors but also from graves and exhumed corpses. The prime objective of the present study is to analyse and interpret the ultrastructural morphology of three sensory organs, namely, the ocellar region, compound eye and antenna of adult male and female *Ophyra capensis* with the help of scanning electron microscopy, so as to facilitate accurate morphological identification of the species in forensic entomological investigations. SEM analysis of the ocellar region revealed that it was larger in size in females and covered with microtrichia. Ultrastructural analysis of the compound eye indicated that the antero-dorsally located ommatidia were larger in size in comparison to the rest of the facets, along with notable sexual dimorphism regarding the size of the ommatidia. The ultrastructure of the antenna displayed the presence of five types of sensilla, two types of chaetic sensilla on the scape and pedicel; trichoid sensilla and two types of basiconic sensilla on the flagellum along with numerous microtrichia. Both types of basiconic sensilla displayed a multiporous surface indicating their characteristic olfactory function. The morphological characteristics of these sensilla along with their probable functions are discussed in greater details.

Graphical abstract

Ophyra capensis displayed sexual dimorphism in certain ultrastructural features of sensory organs, as the ocellar region, pedicel, flagellum, arista and chaetic sensilla of females were found to be larger than that of males.

Contributes to the presumption that these are the key players which assists the females in better vision, as well as, in olfaction to perceive chemical cues from corpse decomposition more easily, so as to help them in oviposition site detection.



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Introduction

In recent times, forensic entomology shows an escalating importance in medico-legal investigations and becomes a distinct branch of forensic science (Amendt et al., 2010; Anderson, 1999; Byrd and Castner, 2009; Catts and Goff, 1992; Haskell et al., 2008; Sukontason et al., 2007b). Though calliphorids and sarcophagids are the initial colonisers of carrion, the importance of muscids should not be underestimated, especially the genus *Ophyra* Robineau-Desvoidy, 1830 as it is of synanthropic and forensic importance. In the recent past, the genus has gained utmost importance and as a matter of fact the ultrastructural studies on antenna of *O. chalcogaster*, *O. aenescens* and *O. albuquerquei* have been conducted (Carrico et al., 2015; Sukontason et al., 2007a). *Ophyra capensis* has a wide distribution range, including the Indian Subregion, Palaearctic region, Argentina, Chile, New York, Algeria (Couri et al., 2009; van Emden, 1965; Grzywacz et al., 2017; Pape and Thompson, 2015; Patitucci et al., 2010; Bozkov et al., 2016; Talebi et al., 2016). Both adult and larval stages are reported to be associated with human cadavers

Habitat preference and resource utilization of avifauna in Kuldiha Wildlife Sanctuary, Odisha, India: Role of eco-ethological gradients

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Habitat preference and resource utilization of avifauna in Kuldiha Wildlife Sanctuary, Odisha, India: Role of eco-ethological gradients

Srinjana Ghosh[1], Santu Paria[2], Prakash Chandra Mardaraj[3] and Susanta Kumar Chakraborty[2,*]

[1]Post Graduate Department of Zoology, Bethune College, Govt. of West Bengal, 181, Bidhan Sarani, Kolkata, West Bengal, India

[2]Department of Zoology: Vidyasagar University, Midnapore-721102, West Bengal, India

[3]Wildlife Biologist, IUCN/SSC BSG, At-Palace, Nilgiri, Post- Rajnilgiri, Balasore, Odisha - 756040, India

*E-mail address: susantachakraborty@yahoo.com

ABSTRACT

The present study has attempted to highlight the avifaunal diversity in two contrasting seasons (pre and post monsoons) from a protected tropical mixed deciduous forest (Kuldiha Wildlife Sanctuary, KWS) in the state of Odisha, India. Through modified line transect method, a total of 107 species of birds belonging to 49 families under 15 orders have been reported. Among them, 12 are winter visitors, 3 are summer visitors, 1 is near threatened and 1 is vulnerable species. Insectivores and frugivores constitute major foraging guilds. Closed canopy forests, forest edges, woodland areas and wetlands provide suitable habitats to all those avifauna. Lower canopy level was found to act as the major microhabitat for several species for meeting major ecobiological attributes of avifauna. The pre-monsoon and monsoon periods have appeared to be the ideal nesting seasons for most of the avian members. Canopy foliage and tree holes were seen to offer the most suitable nesting sites. Significant differences in respect of species richness have been observed among different habitats in different seasons ($F_{5,91}$, $p \leq 0$ in premonsoon, $F_{6,53}$, $p \leq 0$ in post monsoon). The highest Shannon Weiner diversity index (H') was recorded from the forest edge (3.8) during premonsoon and that of lowest in orchard or plantation areas (2.96) during post monsoon. Species Dominance value (D) was observed to

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Original Article

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Anatomy Section

A Comparative Study of Gender Difference in Palatal Rugae Patterns among Bengali Subjects in Murshidabad

ASUTOSH PRAMANIK[1], MADHUMITA DEBNATH[2], MOULIK DEBNATH[3]

ABSTRACT

Introduction: Palatal rugae pattern is reasonably unique to an individual and remain stable throughout lifetime. It can serve to be an important tool in forensic identification, particularly when, other regular methods of identification become difficult.

Aim: To determine whether or not there exists any gender difference in palatal rugae pattern among Bengali subjects in Murshidabad district of West Bengal.

Materials and Methods: The study was conducted on a total of 68 subjects (n=68) belonging to Murshidabad District of West Bengal. The sample was randomly selected comprising 34 males and 34 females. Alginate impressions of the hard palate of subjects were taken and casted by dental stone. The data were assessed based on the Thomas and Kotze classification (1983). Association between rugae forms and gender were tested using student's t-test.

Results: Palatal rugae of right side showed higher prevalence in female (3.706±0.676) and the finding is statistically significant. The curved shaped rugae were significantly predominant in females (2.471±0.992) than in males. The backward directed rugae pattern was significantly predominant in females (3.353±1.704) than in males, but the perpendicular rugae pattern was significantly predominant in males (0.824±0.387) than in females.

Conclusion: The current study reveals significant gender difference in palatal rugae pattern. This unique rugae pattern and gender difference can be used as a reliable aid for identification of subjects in Murshidabad population.

Keywords: Alginate impressions, Forensic Odontology, Palatoscopy

INTRODUCTION

Palatal rugae have been considered relevant for human identification due to its stability and uniqueness for each individual and often being considered equivalent to the fingerprints [1]. Like dermatoglyphics, each individual has a unique palatal rugae configuration that remains unchanged from womb to tomb except in the dimension in proportion to the growth of an individual. Rugae are highly protected configurations because of their internal positions and largely remain insulated by tongue and buccal fat pads. Palatoscopy has gained importance because it can be applied where no finger-prints are available. It can be applied to decomposed bodies, burnt bodies and in cases of missing upper limbs [2,3]. The method is fast, simple, inexpensive and produces no trauma during recordings. Rugae patterns can be analysed very quickly using standardised procedure.

Palatal rugae pattern are unique in every human and often considered equivalent to finger prints. Authors of the current study did not found any comprehensive study on palatal rugae pattern of Bengali people. So, the present study was designed to evaluate the role of palatoscopy in personal identification and sex determination of human subjects in Murshidabad district of West Bengal. The study will aid to create a local database which can be used as important tool for forensic identification.

MATERIALS AND METHODS

The study was a population based cross sectional study conducted in Department of Anatomy, Murshidabad Medical College, Murshidabad, West Bengal, India. Hundred patients attending Dental OPD of Murshidabad medical college were randomly selected and after consideration of exclusion criteria, 68 patients were finally selected for this study. The total duration of study was one year, extending from February 2016 to January 2017. Palatal impression models were collected from all participants. Person without removable and fixed partial dentures and without braces were included in the study. Persons with palatal anomalies (cleft lip, cleft palate etc.,) or injured hard palates were excluded from the present study. Persons residing outside Murshidabad or those unwilling to give consent were also kept out of the present study. Informed consent was taken from all participants.

The oral cavity of subject was rinsed with chlorhexidine (0.12%) mouth wash. An alginate impression of the hard palate of subject was taken and casted by dental stone. The rugae patterns were marked with black permanent marker pen and then were analysed by using the easiest, most practical and standardised technique of Thomas and Kotze classification [4]. This classification is based on the parameters like total number of rugae, number of primary rugae, predominant shape of rugae, predominant direction of rugae and their unifications. Length of rugae was evaluated as primary (>5 mm), secondary (3-5 mm) and fragmentary (<3 mm). Rugae less than 2 mm were not included. Shape of rugae was recorded as curved, wavy, straight and circular [Table/Fig-1]. The direction of rugae was evaluated by measuring the angle formed by the line joining its origin and termination and the line perpendicular to the median raphe and

[Table/Fig-1]: Various types of rugae. A- Converging, B- Diverging, C-circular, D-wavy, E-straight & perpendicular, F-curved, G-forward, H-backward.

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Research Article

In vitro clonal propagation, organogenesis and somatic embryogenesis in *Bacopa monnieri* (L.) Wettst

Dipu Samanta[1], Bidisha Mallick[2] & Debleena Roy[2*]

[1]Department of Botany, Dr. Kanailal Bhattacharyya College, Ramrajatala, Howrah 711 104, India
[2]Department of Botany, Lady Brabourne College, P-1/2, Suhrawardy Avenue, Kolkata 700 017, India

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Correspondence
Debleena Roy
debleenaroy@rediffmail.com

Abstract

Bacopa monnieri (L.) Wettst is a well-known medicinal herb in the Ayurveda. It is also used as laxative and curative for ulcers, inflammation, anaemia, scabies, leucoderma, asthma and epilepsy, enlargement of spleen, leprosy and others. *In vitro* propagation and regeneration through somatic embryogenesis of *B. monnieri* has played an important role in the production of healthy, disease-free plants with desirable traits. In *B. monnieri*, there are few reports which indicate rapid regeneration and somatic embryogenesis. For *in vitro* clonal propagation, the highest shoot formation was obtained when BAP 2 mg/ l used. The best response for rooting was obtained in IAA 1.0 mg/ l. The recorded survival rate of the plants was 70%. Plants were without any detectable phenotypic variations. Cytological study indicated that the chromosome number remain same (2n= 64) in *in vitro* and *in vivo* roots. A rapid, simple and efficient protocol for plantlet regeneration was achieved through embryogenic callus from leaf explants of *B. monnieri*. Callus induction and embryogenesis were significantly affected by presence/absence and type and concentration of growth regulators. Best organogenic callus induction was obtained in MS medium supplemented with BAP 5mg/ l. For induction of somatic embryogenesis, auxin (2, 4-D 1 mg/ l) was used in the culture medium subsequently in basal media for embryo maturation. Kn 0.2 mg/ l was the best for production of plantlet from embryo. Thus, this can be an easiest protocol for stable clonal propagation and plant regeneration through somatic embryogenesis in *B. monnieri*. The protocol used here for propagation and regeneration is much easier, low cost and reliable.

Keywords: *Bacopa monnieri*; *in vitro*; Organogenesis; Rooting; Shoot Bud Multiplication; Somatic Embryogenesis

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Introduction

Bacopa monnieri (L.) Wettst. (Scrophulariaceae) is a well-known medicinal herb in the Ayurveda. The International Union for Conservation of Natural and National Resources has a long time ago listed *Bacopa monnieri* as a threatened species but at present *Bacopa monnieri* comes under Least Concern Category (1). The plant is commonly known as "Brahmi" and found as spreading herbs.

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A STUDY OF POLITICAL ACTIVISM AMONG WOMEN STREET VENDORS AND DOMESTIC WORKERS : A CASE STUDY OF SOUTH KOLKATA

ANASUA CHATTERJEE

Abstract

The main purpose of the present study is to understand the pattern of political activism of the working women. By political activism of the respondent we primarily mean her cognitive orientation (i.e. her knowledge about political parties, symbols, their stay in power and their judgements about political system), evaluative orientation on how political system works including her voting behaviour and partisan preference. Survey was carried by the researcher on 500 women street vendors and domestic workers of South Kolkata in the months from July2016-July 2017. Results: Women working in the unorganised sectors play dual role looking after their children, elders in the family, husbands and also contribute to the family expenditure but they are bound to act as per the whims of their husbands or other male members of her family in decision-making. They consult their husbands, elder members of the family or the community before casting their vote and are not guided by individual preference or choice. Women do not yet exist as an effective political collectivity.

"Political culture is the pattern of individual attitudes and orientation towards politics among the members of a political

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Did Old Private Sector Banks Outperform the New Private Sector Banks? Some Recent Empirical Evidence

Srabani Ghosh*, Gautam Mitra** & Ram Pratap Sinha*

The introduction of economic reforms in 1991 and the implementation of the recommendations of the committee on financial sector reforms and the committee on banking sector reforms resulted in the provision of a level playing field for the private sector banks. With the decline of specialized financial institutions and non banking financial institutions (NBFCs) the role of the banking sector in financing industrial and service sector growth has also increased many folds. In this context, the evaluation of performance of private sector banks demand increased attention from the researchers, academicians and market regulators.

In this context, the present study seeks to compare the performance of old and new private sector banks in terms of a bilateral comparison model. For this, we have constructed a performance frontier of the private commercial banks on the basis of data collected for the period from 2012-13 to 2017-18. In the second stage, we have applied Mann-Whitney Rank Sum test for drawing inference about the comparative performance of the old and new private sector banks. In the third stage, the log of efficiency scores are regressed on selected contextual variables.

Keywords : Bilateral comparison, Data Envelopment Analysis, Censored Regression, Non-Parametric Approach, Private Sector Banks.

Introduction

After following a path of a public sector bank driven policy of mass banking (coupled with increased attention towards priority sector lending) for more than two decades, the Government of India and the Reserve Bank of India (RBI) introduced major policy shift in the banking sector in tune with the policy of Liberalization, Privatization and Globalization. During the 80s and 90s of the previous millennium, banking sector asset quality was gradually worsening and the public sector bank was unable to cater to the needs of the economy. As an integral part of the policy change, an increase in the number of private sector banks were contemplated

* *Assistant Professor, Department of Commerce, Dr. Kanailal Bhattacharyya College, Howrah.*

** *Professor, Department of Business Administration, The University of Burdwan.*

*** *Associate Professor of Economics, Government College of Engineering & Leather Technology, Salt Lake, Kolkata-700106, India.*

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Augmentation of antioxidative potential of *in vitro* propagated *Mentha piperita* L.

Debleena Roy[1]*, Bidisha Mallick[1] & Dipu Samanta[2]

[1]Department of Botany, Lady Brabourne College, P 1/2 Suhrawardy Avenue, Kolkata-700 017, West Bengal, India
[2]Department of Botany, Dr. Kanailal Bhattacharyya College, Ramrajatala, Santragachi, Howrah-711 104, West Bengal, India

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Mentha piperita L., as an aromatic culinary herb and a source of variety of phytochemicals including effective antioxidants, is overexploited by food industry. It demands rapid conservation by means of *in vitro* propagation of improved clones. Here, we have made an attempt to evaluate and augment the antioxidative potential of *M. piperita* L. by additing a precursor to the tissue culture derived clones and compared it with the *in vivo* plants so that tissue culture derived plants can serve as an alternative source of drug. *M. piperita* L. were analyzed for total phenol, flavonoids, total antioxidant activity, free radical scavenging activity and lipid peroxidase activity. Total phenol content in *in vivo* plants was lesser than in *in vitro*. In case of total flavonoid content, it also varies through the season where tissue culture derived plants showed similar and continuous production of total flavonoids content. The percentage inhibition of the *in vitro* plant extract of precursor fed clone was higher than that of *in vivo* plant extract. Antioxidant capacity of ascorbic acid was used as a reference standard from which plant extracts with potential antioxidant activity were compared. After addition of precursor, the *in vitro* mint plant proved more efficient in inhibiting lipid peroxidation after one hour than the *in vivo* plant, which has high absorbance value indicating lipid peroxide formation.

Keywords: Antioxidant activity, Mint, Nutraceuticals, Peppermint, Phenylalanine

Mentha piperita L., (Fam. Lamiaceae), commonly called Peppermint, is the aromatic culinary herb widely used ancient time to flavour foods[1]. This herb is also a source of various phytochemicals, including polyphenols which are highly effective antioxidants and less toxic than the well-known synthetic antioxidants as BHA and BHT[2]. As all species of this genus contain high amounts of secondary metabolites, it is overexploited by the food and drug industries making the natural resource threatened. *In vitro* rapid propagation for production of improved clones is desirable for rapid conservation and commercial exploitation of this economically important plant[3]. Tissue culture techniques are used as alternative methods for propagation and conservation of germplasm of this medicinal plant in many countries. Micropropagation technique provides new possibilities for *in vitro* propagation and multiplication of plants and also recognized as an efficient tool for rapid clonal propagation[4]. In this context, application of plant tissue culture has gained major industrial importance in three main areas: (i) Inbreeding and genetics for conservation[5]; (ii) Model systems for plant biochemistry and pathology to produce disease free crops; and (iii) Production of secondary metabolites for exploitation by food, drug and pharmaceutical industries[6]. The growing demand for natural renewable products has brought researchers' attention to *in vitro* plant materials as potential factories for secondary phytochemical products, and has been driving research focus on secondary product expression *in vitro*. The deliberate stimulation of defined chemical products under highly controlled microenvironment regimes provides an excellent forum for in-depth investigation of biochemical and metabolic pathways[7].

In the present study, we have made an attempt to conserve the medicinally important culinary herb, *Mentha piperita* L. through *in vitro* propagation and also evaluated the augmented antioxidative potential of the tissue culture derived clones and compared the values with that of *in vivo* field grown plants.

Materials and Methods

Collection of plant material

Mentha piperita L. was collected from NBPGR, New Delhi bearing strain no IC:54537. *In vivo* plants were maintained in the medicinal garden of Lady Brabourne College. The antioxidant potential of the *in vivo* plants in four seasons, January (Juvenile stage), May (4 months of age), July (6 months of age), October (10 months of age) were taken into account and an average was calculated and the average annual productivity was compared with the *in vitro* regenerates of same age maintained in the laboratory.

Multiplication of shoot buds

Apical and axillary buds of 2-3 cm length from *in vivo* plants were taken as explants. Media used for

*Correspondence:
Phone: 9748881717 (mob.)
E-mail - debleenaroy@rediffmail.com

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Review Article

Insights into the phytochemical potential of *Lawsonia inermis* L. for future small molecule based therapeutic applications

Debapriya Das[1], Dipu Samanta[2], Rajat Banerjee[3], Suchita Sinha[1], Bidisha Mallick[1], Sayak Ganguli[4] & Debleena Roy[1]*

[1]Post Graduate Department of Botany, Lady Brabourne College, Kolkata 700017, India.

[2]Department of Botany, Dr. Kanailal Bhattacharyya College, Howrah, 711104, India.

[3]Dr. B. C. Guha Centre of Biotechnology and Genetic Engineering, University of Calcutta, 35, Ballygunge Circular Road, Kolkata 700019, India.

[4]Department of Biotechnology, St. Xavier's College (Autonomous), Kolkata 700016, India."

*Corresponding author's e-mail: debleenaroy@rediffmail.com

Abstract

Lawsonia inermis L., commonly known as Henna plant, have been reported to be useful both medicinally and commercially. The phytochemical extract of this plant leaves have been reported to be a rich source of phenols, glycosides, anthraquinones and many other active constituents. Therapeutically, this plant has been used to treat diabetes, arthritis, obesity, ulcers, wounds, microbial infections, inflammation and liver damage. The extracts have also been instrumental in lowering blood sugar and cholesterol levels in mice. But one of the most crucial aspects of this plant is, limiting the growth of malignant cells. Extracts have shown apoptosis promoting activity in human cancer cell lines like breast cancer cells. The pigment lawsone, is commercially used on a large scale, as a dying agent for fabrics and skin. This component has shown potential role in reducing oxidative burst in cell, hence, establishing its role as an antioxidant, which should help researchers to manipulate the property, for establishing new potential drugs against cancer. Apart from "Lawsone" the small molecule reservoir of *Lawsonia inermis* L. have not been commercially utilized effectively and in the future these bioactive compound set should be explored for formulating new chemical entities.

Keywords: Antioxidant; Therapeutic; Small molecule; Drugs.

INTRODUCTION

Red henna or *Lawsonia inermis* L. (Lythraceae), is a perennial shrub, widely cultivated in tropical regions of Egypt, America, India and Middle East (Singh, et al., 2012), commonly known as Mehndi. Commonly known as Cypress shrub, Samphire, Mendika, Timir, Rakigarbha, Goranta, Kormi, Maruthani and Mayilanchi, this plant develops white and rose-red flowers. The plant grows to a height of about six meters. Leaves are opposite, sub-sessile, acuminate, lanceolate, glabrous and contain lawsone, (naphthoquinone) which is used to dye fingers, fabrics and hair. Henna fruits usually ripen at the end of summer, each fruit bearing about 40-45 seeds. When young, the plant has low dye content and lacks spine. As the plant matures, the dye content increases and spine formation occurs. In India, commercial Henna production is found in states of Rajasthan (Jodhpur and Pilani), Thane, Kalyan and Badlapur (Phirke, et al., 2013). In the Rajasthan region, due to an arid atmosphere, low rainfall and poor soil fertility conditions, cultivation of Henna plant by the farmers, provide a good source of income. Also, uninterrupted growth of Henna plant in elevated temperatures and poor soil conditions indicate the potential role of this plant in fixing atmospheric carbon at a time of climate crisis due to rise in global warming.

Henna plant leaves have a wide plethora of medicinal uses. Extracts of mainly leaves can be used as anti-diabetic (Widyawati, et al., 2019), anti-arthritis (Ramya, et al., 2015; Kadhem, 2016), in treatment of bacterial infections (Hussain, et al., 2011; Habbal, et al., 2011; Raja, et al., 2013; Rahiman, et al, 2013; Akintunde, et al., 2017), fungal infections (Rizvi, et al., 2013), diarrhea, obesity, liver damage (Bhaskaran and Shruthi, 2016; Mohamed, et al., 2016), ulcers (Goswami, et

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KULTURA SPOŁECZEŃSTWO EDUKACJA

Anasua Chatterjee*
Howrah, West-Bengal, India
Affiliated to University of Calcutta

'Empowerment in Practice and Its Impact on Political Participation': A Study Among Working Women of South Kolkata[1]

KEYWORDS

women, empowerment, decision-making power, civil society, political participation, partisan preference

ABSTRACT

Anasua Chatterjee, *'Empowerment in Practice and Its Impact on Political Participation': A Study Among Working Women of South Kolkata*. Culture – Society – Education no. 2(18) 2020, Poznań 2020, pp. 187–206, Adam Mickiewicz University Press. ISSN 2300-0422. DOI 10.14746/kse.2020.18.7.

The main purpose of the present study is to understand 'empowerment' as observed in theory and in actual practice in the society where women are still regarded as second-class citizens inspite of achieving success in their chosen fields. Her freedom in choice of decision-making within the family and civil society plays an important part in influencing her participation in politics and her voting behaviour. By political activism of the respondent we primarily mean her cognitive orientation (i.e. her knowledge about political parties, symbols, their stay in power and their judgements about political system), evaluative orientation on how political system works including her voting behaviour and partisan preference. Survey was carried by the researcher on 1000 women working in both the organised and unorganised sectors of the economy mainly among street vendors and domestic workers and bank employees and teachers in Kolkata. Results: Women working in both the sectors play dual role looking after their children, elders in the family, husbands and also contribute to the family expenditure but lack effective power in decision-making. They consult their husbands, elder members of the family or the community before casting their vote and are not guided by individual preference or choice.

* ORCID: 0000-0002-5608-5694.

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ıvestigation of the antigenicity and protective efficacy of *Leishmania* ıromastigote membrane antigens in search of potential diagnostic and 'accine candidates against visceral leishmaniasis

• Sarfaraz Ahmad Ejazi,
• Smriti Ghosh,
• Anirban Bhattacharyya,
• Mohd Kamran,
• Sonali Das,
• Sudipta Bhowmick,
• Mehebubar Rahaman,
• Rama Prosad Goswami &
•
• Nahid Ali

Show authors

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Parasites & Vectors

RESEARCH Open Access

Investigation of the antigenicity and protective efficacy of *Leishmania* promastigote membrane antigens in search of potential diagnostic and vaccine candidates against visceral leishmaniasis

Sarfaraz Ahmad Ejazi[1†], Smriti Ghosh[1,2†], Anirban Bhattacharyya[1], Mohd Kamran[1], Sonali Das[1], Sudipta Bhowmick[1,3], Mehebubar Rahaman[4], Rama Prosad Goswami[4] and Nahid Ali[1*]

Abstract

Background: Visceral leishmaniasis (VL), is a parasitic disease that causes serious medical consequences if treatment is delayed. Despite a decline in the number of VL cases in the Indian subcontinent, the commencement of the disease in newer areas continues to be a major concern. Although serological diagnosis mainly by immunochromatographic tests has been found to be effective, a test of cure in different phases of treatment is still desired. Even though a good prophylactic response has been obtained in murine models by a number of vaccine candidates, few have been proposed for human use.

Methods: In this study, nine antigenic components (31, 34, 36, 45, 51, 63, 72, 91 and 97 kDa) of *Leishmania* promastigote membrane antigens (LAg), were electroeluted and evaluated through ELISA to diagnose and distinguish active VL from one month cured and six months post-treatment patients. Further, to investigate the immunogenicity of electroeluted proteins, human PBMCs of cured VL patients were stimulated with 31, 34, 51, 63, 72 and 91 kDa proteins.

Results: We found that 34 and 51 kDa proteins show 100% sensitivity and specificity with healthy controls and other diseases. After six months post-treatment, antibodies to 72 and 91 kDa antigens show a significant decline to almost normal levels. This suggests that 34 and 51 kDa proteins are efficient in diagnosis, whereas 72 and 91 kDa proteins may be used to monitor treatment outcome. In another assay, 51 and 63 kDa proteins demonstrated maximum ability to upregulate IFN-γ and IL-12 with minimum induction of IL-10 and TGF-β. The results indicating that 51 and 63 kDa proteins could be strong candidates for human immunization against VL. In contrast, 34 and 91 kDa proteins demonstrated a reverse profile and may not be a good vaccine candidate.

Conclusions: The preliminary data obtained in this study proposes the potential of some of the antigens in *Leishmania* diagnosis and for test of cure. Additionally, some antigens demonstrated good immunoprophylactic cytokine production through T cell-mediated immune response, suggesting future vaccine candidates for VL. However, further studies are necessary to explore these antigens in diagnosis and to access the long-term immune response.

*Correspondence: nali@icb.res.in
†Sarfaraz Ahmad Ejazi and Smriti Ghosh contributed equally to this work
[1] Infectious Diseases and Immunology Division, Indian Institute of Chemical Biology, Kolkata, West Bengal, India
Full list of author information is available at the end of the article

Phone : 2627-2490 (College Off.)
Principal : 9903389092
Whatsapp : 8697383305
Fax : 91-33-2627-3241
E-mail : klb.college@gmail.com
Website : www.drklbcollege.ac.in

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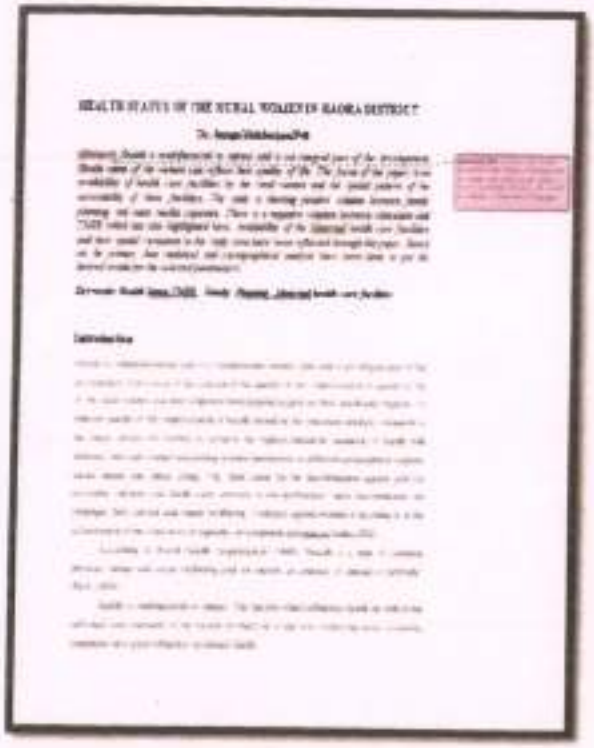

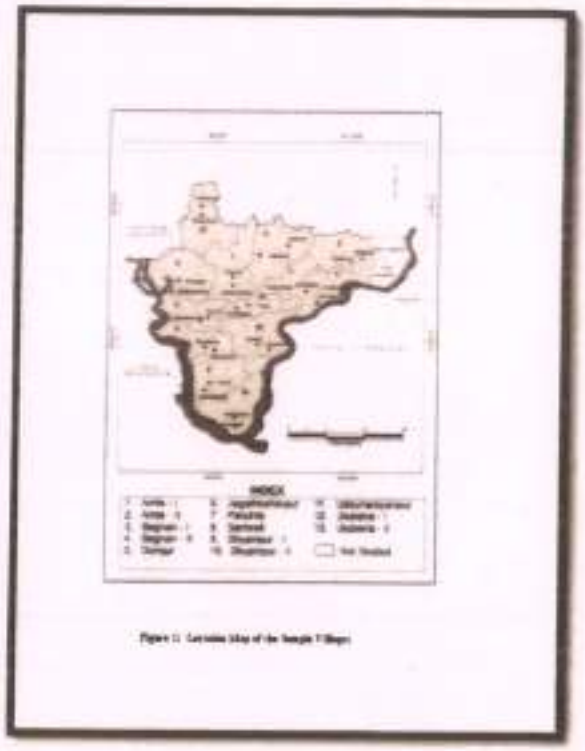

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University of Calcutta
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Hybrid larval lethality of Drosophila *is caused by parent-of-origin expression: an insight from imaginal discs morphogenesis of* Lhr *pausing rescue hybrids of* D. melanogaster *and* D. simulans

R. N. Chatterjee, S. Kuthe & Piyali Chatterje

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ORIGINAL ARTICLE

Hybrid larval lethality of *Drosophila* is caused by parent-of-origin expression: an insight from imaginal discs morphogenesis of *Lhr* pausing rescue hybrids of *D. melanogaster* and *D. simulans*

R. N. Chatterjee[1] · S. Kuthe[1,2] · Piyali Chatterje[1,3]

Received: 20 May 2020 / Accepted: 15 June 2020

Abstract

Hybrid males that inherit haploid set of chromosomes along with *Hybrid male rescue*, (*Hmr*$^+$) gene from *D. melanogaster* mother and an autosomal set with *Lethal hybrid rescue*, (*Lhr*$^+$) gene from *D. simulans* father, die at the larval/pupal transition phase due to insufficient growth of imaginal disc tissues. Comparable pattern reminiscent of hybrid F_1 female lethality was noted when *D. melanogaster* compound XX (XXY AA) females were crossed with *D. simulans* males. The lethality is suppressed when the hybrids inherit one mutant allele of hybrid incompatibility gene (either *Lhr*$^-$, or *Hmr*$^-$) from either of the parent. In order to better understand the cause of lethality of F_1 hybrids at larval stage, the imaginal discs development of lethal hybrids were examined and compared with those of 'rescued' hybrids with *Lhr*$^-$ and parental species. The study revealed the following major findings: (a) when hybrid male and female larvae carry only *D. melanogaster* X chromosome(s) in presence of both *Lhr*$^+$ and *Hmr*$^+$ genes, broad-ranging cell death reaction was induced in the disc tissues and eventually death of the hybrid larvae, (b) when hybrid females carry the X chromosome of both species in the background of maternal cytoplasm of *D. melanogaster*, the frequency of cell death in the discs was reduced significantly and discs were able to metamorphose, (c) when hybrid males and females inherit one set of autosome from *Lhr* null strain of *D. simulans*, the frequency of non-apoptotic cell death in the discs was suppressed significantly and discs development were restored, although the discs displayed fluctuating asymmetric of development. To understand the defects in the chromosomal organization associated with abnormal development of the 'rescued' hybrids, the functional organization of the polytene chromosomes of the 'rescued' hybrids were examined. It was noted that incomplete pairing of the autosomes of two species along with abnormal X chromosomal telomeric structure may have some bearing on developmental defects of the 'rescued' hybrids. From the results it is suggested that (1) cell death reaction in the imaginal discs of the larval lethal hybrids may be the result of divergent lineage of maternal and paternal sets of chromosomes in zygote in presences of two species specific mediator genes, *Lhr*$^+$, and *Hmr*$^+$, (2) suppression of larval lethality, in absence of *Lhr* function, indicated that the non-apoptotic type of cell death factor in the disc cells was controlled genetically by the two mediator genes in the disc cells, (3) re-specification of compartmental organization of paternal segment polarity genes in 'rescued' hybrid discs might cause non-random tissue damages and eventually the apoptotic type of cell death resulting into asymmetric development of the appendages in hybrids. In sum, our data revealed that cell death reaction in imaginal discs, associated with larval lethality in hybrids was a developmentally controlled program, through incompatible interactions between species specific mediator genes, *Lhr*$^+$, *Hmr*$^+$ and *D. melanogaster* X chromosome and the pattern of cell death reaction in the discs was different from apoptosis.

Keywords *Drosophila* · *D. simulans* · Lethal hybrid rescue genes · Imaginal disc

Introduction

Interspecific hybrids offer an unparalleled opportunity to study regulatory incompatibilities associated with speciation. These abnormalities reflect deleterious interaction as a consequence of independent, non-coordinated genetic changes accumulated between two gene pools in absence of

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CONTENTS

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Original Article

Influence of the Home Cooking Practices on the Bioactive Components of Two Important Edible Herbs- *Amaranthus viridis* and *Amaranthus tricolor*

Debleena Roy[1], Renia Mullick[1], Namrata Chakraborty[1], Jayeesha Ghosh[1], Debapriya Das[1], Bidisha Mallick[1], Dipu Samanta[2,*]
[1]Department of Botany, Lady Brabourne College, Suhrawardy Avenue, Kolkata, West Bengal, INDIA
[2]Department of Botany, Dr. Kanailal Bhattacharyya College, Ramrajatala, Howrah, West Bengal, INDIA

ABSTRACT

Background: Antioxidants are substances that delays or inhibits the oxidation of a substrate by countering highly unstable entities (ROS and free radicals) that can cause cellular damage. Some natural source of antioxidants is green leafy vegetables like *Amaranthus*. Results of vegetable composition are usually determined on raw material, however for nutritional purposes most of them are cooked in different ways before consumption. In India, vegetables we consume are cooked by boiling in water, fried in oil or microwaved. **Objectives:** This paper mainly focuses on the comparative study of raw, boiled and fried forms of *Amaranthus viridis* and *Amaranthus tricolor* to ensure which form of vegetable intake provides proper amount of antioxidants to our body in order to boost the antioxidant profile. **Methods:** Total phenol content, flavonoid content, free radical scavenging activity, estimation of total inhibitor capability and estimation of Quercetin, Kaempferol and Rutin by HPTLC analysis were carried on raw, boiled and fried forms of *Amaranthus viridis* and *Amaranthus tricolor*. **Results:** The cooking processes lead significant changes in physical characteristics and chemical composition influencing the concentration and bioavailability of bioactive compounds of vegetables. The fried material is heated only on the surface so that the phenolic antioxidant losses are insignificant. **Conclusion:** The raw forms of green and fried form of red are more suitable for uptake. Also, green species contains more antioxidants than the red one.

Key words: *Amaranthus*, Antioxidant, Flavonoids, Phenolics, HPTLC

Correspondence

Dr. Dipu Samanta

Department of Botany, Dr. Kanailal Bhattacharyya College, Ramrajatala, Howrah-711104, West Bengal, INDIA

Phone: +91 9804959021

Email: dipusamanta2010@gmail.com

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INTRODUCTION

A healthy diet and lifestyle measure cornerstones of good health and reduces risk for disease. A healthy lifestyle includes diet supported, selection and moderation coupled with regular physical activity commensurate with one's age, gender and body constitution. Micronutrient Deficiencies (MNDs) are major concerns of public health and of socioeconomic importance worldwide having an effect on low-income countries. However health issues in industrialized societies, also, impacts the population.[1] By overwhelming a healthy diet, several of the health issues are avoided. Among the various plant-based food sources, leafy vegetables provide antioxidants, minerals and vitamins. It has been established that increase in vegetable consumption reduces the chance of cancer, cardiovascular diseases and mortality as a result of the presence of antioxidants like water-soluble Vitamin, Vitamin E, carotenoids and polyphenols.

Amaranthus (family Amaranthaceae), commonly called amaranths, are herbaceous plant that is either annual or perennial. Some amaranth species square measure cultivated as leaf vegetables. Most of the *Amaranthus* species are summer annual weeds, commonly known as pigweeds. The genus *Amaranthus* varies in flower, leaf and stem colour with a variety of pigments from the spectrum of maroon to crimson and may grow lengthwise from 3–8 foot (0.9–2.4 m) tall with a cylindrical, succulent, fibrous stem. The genus, is native to North America.

Amaranth leaves are called super food as they are beneficial for our health. Amaranth leaves contain essential phytonutrients and antioxidants that facilitate to reduce inflammation within the body and supply an additional boost of nutrition to one's health.[2] The plant is a rich source of protein, low in calories, high in fiber and different minerals. The plant contains flavonoid, polyphenolic antioxidants like carotenoid, zeaxanthin and xanthophyll which offer a protecting layer against stress caused by free radicals.[3] Amongst all the inexperienced leafed vegetables, across the board, amaranth leaves have the very best amount of naphthoquinone, Vitamin B and different minerals. Having a protein-rich diet results in suppression of hunger as they scale back hypoglycemic agent levels within the blood and keep one feeling surfeited.

Amaranthus tricolor L. (laalshaak) has antitumor, anti-inflammatory properties as they contain minerals like iron and calcium, pigments like betalains and flavonoids. Inexperienced amaranth (*Amaranthus viridis* L.) (noteyshaak), on the other hand is historically accustomed cure of constipation, eczema, anemia, bronchitis, eye infections, infectious disease etc.[4] In India, *Amaranthus* leaves are used in different ways, either by cooking the Amaranth leaves with many spices, garlic and onion, called lalsaak or chaulaisaak. Sometimes, it's conjointly hard-baked with lentils and served with rice or roti. Another variation is finished wherever a form of curry is formed with Amaranth leaves and gram flour. In Kerala, a dish referred to as cheerathoranis created by finely chopping the amaranth leaves and cooking them with grated coconut, chilies, curry leaves and hound spices. In state, it's called keeraimasial and served with steamed rice. Fresh, tender leaves and shoots of Amaranth is devoured raw in salads or as juice.

Several studies to date have largely been conducted either in raw kind or blanched kinds of the plant sample. However, no reports to date

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ASSOCIATION OF AIR POLLUTION PARAMETERS AND NATURAL CALAMITY WITH COVID-19: A STUDY FROM METROPOLITAN KOLKATA, WEST BENGAL, INDIA

ANIRBAN MITRA[1], GARIMA HORE[2], SANJIMA PAL[3], SHYAMASREE GHOSH[4]

1=Department of Statistics, University of Pittsburgh. 1826 Wesley W. Posvar Hall, 230 S Bouquet Street, Pittsburgh, PA 15260, USA

2= State Aided College Teacher (S.A.C.T.), Department of Zoology, Dr.Kanailal Bhattacharyya College, Dharmatala, Ramrajatala, Santragachi, Howrah- 711104, West Bengal, India.

3= Department of Radiation Oncology, University of Michigan, 1500 E Medical Center Dr, Ann Arbor. MI 48109, USA

4= School of Biological Sciences, National Institute of Science Education and Research (NISER), Bhubaneswar, Odisha 752050, India; Homi Bhabha National Institute, Training School Complex, Anushakti Nagar, Mumbai 400094, India.

Corresponding author: Email: shyamasree_b@yahoo.com, sree.s@niser.ac.in

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Abstract: COVID-19, caused by the infection of a novel coronavirus, is a global health problem claiming millions of lives across the globe and affecting the lives, livelihood, economy, health systems. This outbreak has been classified as a global 'pandemic' by the World Health Organisation (WHO) in March 2020. Few studies have indicated air pollutants as a risk factor for the spread of this deadly infection. In the current study, we reported the relationship between ambient air pollutants including particulate matter (PM) e.g., PM2.5, PM10, sulfur dioxide (SO_2), Carbon monoxide (CO), nitrogen dioxide (NO_2), and ozone (O_3) and impact of the natural calamity, super Cyclonic Storm **Amphan** on the incidence of novel coronavirus infection from the state of West Bengal, India. From our study, we reported that Air Quality Index (AQI), NO_2, NH_3, CO, O_3 are the pollutants that bear a significant association with the increasing incidence of the viral infection in an overpopulated urban area, Kolkata. We also noticed that humidity, air temperature, and wind speed have a significant effect on virus incidence.

Keywords: Air pollution; COVID-19; Kolkata; Generalized additive model

INTRODUCTION

Zoonotic infection of the highly contagious disease of COVID-19 is caused by a novel, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). SARS-CoV-2 is an enveloped, nucleocapsid containing, positive-strand RNA virus belonging to the order *Nidovirales*, family *Coronaviridae*, subfamily *Orthocoronavirinae*, genera *Betacoronavirus* (β-CoV). It appears in pleomorphic forms (round or elliptic shapes) with a diameter ranging from 60–140 nm and reveals sensitivity to ultraviolet rays (UV rays) and heat (CASCELLA *et al*., 2020: CHAN *et al*., 2013; CHEN *et al*., 2020). CoVs, has a large size of the genome, 30 kb in length with a 5′-cap and 3′-poly-A tail. The spike glycoproteins of the novel coronavirus, SARS-CoV-2 are known to play a major role in the process of infection and viral entry in the host cell (BELOUZARD *et al*., 2012; ORTEGA *et al*., 2020).

WEBINAR ITS EFFECTIVENESS, MERITS AND DEMERITS UNDER COVID -19 CONDITION

Dr.Samir Kumar Naskar
Assistant Professor, Department of Education
Dr.Kanailal Bhattacharyya College, Howrah, West Bengal, India
E-mail:naskarsamirkumar07@gmail.com

Abstract

Covid-19, is a global pandemic situation which compels people to follow social distancing as a protective measure from Covid. It has made people mandatory to sit indoor and sitting idle indoor may lead to mental stress. Hence to keep people engaged and free from mental stress, online learning can play important role. Online learning is the best solution during this pandemic situation. The teachers can carry out classrooms to reach the learner from home. The online virtual instruction may be effective when proper support systems are used. Pandemic also compel the learners to stay at home for long period of time and obstruct offline teaching-learning process. This article emphasizes on how online learning is beneficial during such crises. Therefore, some techniques for online instruction which can ensure the continuity of learning have been highlighted in this paper. Merits and demerits of online learning platform have also been discussed. Perceptions of Learners, Teachers and the Educators about online learning system during lockdown have been indicated.

Key words: webinar, engagement, online students, education

The concept of Webinar

Webinar is described as 'a technique of using the internet to allow a seminar or training program to be delivered to a restricted audience, with the aim of exchanging information.' On-demand webinars allow viewers to watch anytime they want, whether it is live or after the occurrence of event. However, webinars utilize a progressive video feed instead of a download. The capability to publish and disseminate recorded webinars throughout a site or database is important to learners who want to take advantage of on-demand access. The whole point of training is that learners have immediate access to training material, and limitless replay is available. Webinars are successful when they include interactive aspects, such as giving, receiving, and discussing information. To participate in an interactive feature, such as discussion boards and online chat rooms, webinar attendees must be located on the same website as the webinar. In other instances of live discussion and panel programs, trainees may ask questions or make comments which can be conveyed to the panel. By enabling trainees to contribute material, the experience will become more engaging and result in a better learning experience.

IMPACT OF COVID19 ON PHYSICAL AND PSYCHOLOGICAL WELLBEING OF CHILDREN

Dr. Sampa Ray Bagchi

Assistant Professor,Dr. Kanailal Bhattacharyya College.

Ramrajatala,Howrah -4

mail id:raybagchisampa2005@gmail.com M 9836569066

ABSTRACT

We the people of the world are feeling helpless after the Covid 19 pandemic and lockdown. On 11th March 2020 WHO declared COVID 19 as a Pandemic. The worst affected are the children of varying age ranges especially of 5years to 13 years of age. The number of confirmed cases of Covid 19 as reported to WHO, in the last 24 hours as of July 1st, 2021 is 30,411,634, number of death cases being 399 ,459 and new cases being 48,786.This increase in Covid 19 cases, led to the imposed restrictions by the Government of different countries of the world for welfare of its people. Children, children with pre existing mental conditions, children being quarantined for Covid 19 in their family, or the fear of losing their near and dear ones, and also the thought of getting the infection themselves has brought about panic, among the children affecting their mental, physical, psychological wellbeing. Again their vulnerability, of being separated from school, school friends, relatives, not being able to play with friends, go to park, clubs, and places of entertainment, shopping and eating out, not being able to go for vacation puts them in a stressful situation. All these have taken them away from their zone of comfort. This new normal situation also brings with it restrictions as social distancing, being confined at home, wearing masks which also puts a pressure on their tender minds. Moreover, the tenacity to take the pressure of doing and coping with the online education is also giving them pressure. So, the mental and physical well being of the children needs to be addressed during this time for their well being, and also as a future torch bearer of the Nation.

This paper indicates the nature of physical and psychological impact of covid 19 on the children.

STUDENT UNDER COVID -19 CONDITIONS: A SOCIO-CULTURAL PERSPECTIVE

Dr. Samir Kumar Naskar
Assistant Professor, Department of Education
Dr. Kanailal Bhattacharyya College, Howrah, West Bengal, India
Mail id: naskarsamirkumar07@gmail.com
Debashis Kayal
M.Phil. Research Scholar, University of Calcutta
Mail id: debashis500.kayal@gmail.com

Abstract

The Covid-19 pandemic could have profound and potentially long-term impacts on psychological health, economic, social and cultural life. The present pandemic is clearly having a major social and cultural impact on the whole population especially Students, increasing unemployment, separating families and various other changes which are generally considered as major psychological and socio cultural risk factors for anxiety, depression and frustration.

The purpose of this analysis is twofold: (i) to explore the socio-cultural impact of Covid-19 on Student and also (ii) to find out the well-being strategies of the Students amidst new-normal stage under Covid-19. The methodology includes a systematic review of subject literature and secondary data collected from various reference books, eBooks and web resources. The present paper indicates the nature of socio-cultural impact of Covid-19 on the students. The analysis concludes that Government needs to design and implement the well-being policy for the Students under new-normal stage in Covid-19.

Key-words: Covid-19, lockdown, quarantine, unemployment, well-being, online counseling.

1. Introduction

The COVID-19 outbreak is a global public health crisis. COVID-19 justifies that scientific cooperation is the key component when dealing with a global public health issue. It tells us that systematic education should be ensured when so many Students are unable to go to school. It is a stark reminder about the importance of quality, reliable information, at a time when rumors are flourishing. It tells about the power of culture & knowledge to strengthen human fabric and

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Research Article

A review on the potential of bacosides as *therapeutic lead* molecules

Debleena Roy[1]*, Renia Mullick[1], Debapriya Das[1], Dipu Samanta[2] and Sayak Ganguli[3]

[1]Post Graduate Department of Botany, Lady Brabourne College, Kolkata 700017, India.

[2]Department of Botany, Dr. Kanailal Bhattacharyya College, Howrah, 711104, India.

[3]Department of Biotechnology, St. Xavier's College (Autonomous), Kolkata 700016, India

Correspondence email: debleenaroy@rediffmail.com

Abstract

The Ayurvedic medicinal system employs a holistic approach to health, utilizing the synergistic properties of organic resources. The Ayurvedic herb *Bacopa monnieri* (L.) Wettst. (Brahmi) contains several phytoconstituents mainly saponins (bacosides) and flavonoids. Among the saponins, bacosides are the main active phytoconstituent that can be extracted from Brahmi. The most potent small molecule component that has been utilized for Computer Aided Molecular Docking experiments is Bacoside –A. The aim of this current review is to critically summarize the successful investigations regarding the role of bacosides and their effects against several diseases, which can be further utilized in the drug industry.

Keywords: *Bacopa monnieri*, phytoconstituents, saponins, bacoside, drug.

INTRODUCTION

In the folklore of Indian medicine, several herbs have been used traditionally as health tonics. Phytochemicals are different non-nutritive substances that are derived from these plants that do have some health benefitting properties (Craig, 1997). The different plant products that are consumed as foods are rich in different types of terpenoids, phenolic compounds, pigments and natural antioxidants that have the capacity to protect the body from different diseases like heart ailments, diabetes, hypertension, hypercholesterolemia, osteoporosis, cancer and different other medical conditions (Craig, 1997; Murkies, et al, 1998).

Bacopa monnieri (L) Wettst, is a well-known plant having several common names which evidences its continuous use a nootropic; such as water hyssop, Brahmi, Bramabhi, and Nirabarhmi. Morphologically it is a creeping plant generally abundant in warm, marshy wetlands, often colonial in their distribution. Members have been reported from Indian subcontinent, East Asia, Australia, and the United States. *Bacopa* has white to light purple flowers and small leaves, and is a rich genera with over 100 species attributed to it (Lurie, 2015; Russo & Borrelli, 2005; Shinomol & Muralidhara, 2011; Williamson, 2002). Ayurvedic physicians and the practitioners of the traditional system of medicine of India have relied on *Bacopa* for more than thousand years, and we can find scriptures such as Charaka Samhita (2500 B.C.) and the Susrata Samhita (2300 B.C.) containing references of the use of this plant, where it has been reported to impart action on the central nervous system (CNS) (PV Sharma, 2011; Rai, et al, 2003). Over the years it has been described as a brain tonic and recommended for the management of anxiety, poor cognition, and lack of concentration (Russo and Borrelli, 2005). *Bacopa* has also been reported for its efficacy towards the treatment of numerous inflammatory conditions such as asthma, bronchitis, dropsy, and rheumatism (Channa et al., 2006).

According to the summary report that was submitted to the Department of Ayush, Ministry of Health and Family Welfare in August 2008, *Bacopa monnieri* is considered as one of the most popular medicinal plants due to its broad range of therapeutic properties and generally desired for export development (Saini et al., 2012). Animal research has shown that the *Bacopa monnieri* extracts modulate the expression of certain enzymes involved in generation and scavenging of reactive oxygen species in the brain (Gohil & Patel., 2009). It was suggested that the adaptogenic properties of the herb would be beneficial in the management of stress related conditions also. The pharmacological properties of Brahmi were studied thoroughly and its activities were mainly due to the presence of a special type of saponin

Effectiveness of Teaching Accountancy at the Higher Secondary Level through Group Interactive Model

Samir Kumar Naskar
Assistant Professor, Department of Education, Dr. Kanailal Bhattacharyya College
Ramrajatala, Howrah – 711104, West Bengal
E-mail: naskar_samirkumar@yahoo.com

ABSTRACT

In the present study an effort has been made to study the effectiveness of Group Interactive Model for teaching accountancy at the Higher Secondary Level. The sample consisted of 180 students of class XI for the three selected urban Higher Secondary Bengali Medium Schools in the Dist. of 24 Pgs. in West Bengal. Data were analyzed by using different techniques of statistics to draw the conclusions.

Introduction:

A large number of students opt commerce stream at the higher secondary level in West Bengal for education not only for higher secondary level but also to confirm their studies at higher levels. It is also a common expectation that most of the students will achieve a good marks and knowledge in commerce stream. But the researcher observed that a large number of students at the higher secondary level were unable to acquire adequate knowledge on the concepts of Accountancy. It was also found that the achievement of students in Accountancy was not satisfactory in their final examinations. The results of the examinations indicate clear learning gaps in learning the concepts of Accountancy. There may be many factors, which are responsible for poor achievement of students in Accountancy at the higher secondary level. Some of the factors can control and some can manipulate during the time of instruction. But the most important factors as indicated by the experts in this field were:

i) Lack of sequential presentation of contents in the curriculum, i.e. content gaps.
ii) Using inappropriate strategy of teaching for transaction of curriculum of Accountancy, i.e. strategy gaps.
iii) Lack of previous experience on contents that is learners' own learning gaps.

It is assumed that content gaps, strategy gaps and gaps in knowledge on previous concepts enhance the future learning gaps or conceptual gaps, as a result most of the students, either achieve very poor marks in the subject or they are ready to withdraw themselves from learning the subject. Hence, there are long term effects of gaps in the process of acquiring knowledge and scholastic achievement. How far this proposition was justified required an in-depth study. Keeping in view the problems of acquiring adequate knowledge in the subject the study was conducted to develop an effective strategy for minimizing the gaps through curricular transaction. After a detail analysis of some of the common strategies, both for individual and group instruction and in consultation with the experts, one strategy was selected. The selected strategy was Group Interactive Model. Conceptual analysis of the strategy has been stated hereunder.

Group Interactive Model (GIM):

The Group Interactive Model was designed by Prof. Tarak Nath Pan (2005) as a strategy of teaching through group interactions. The model was designed on the approach of peer interactions by regulating the formal classroom setup. In our classroom situation students are instructed by the teacher on the selected content for a limited time, say for 40 to 45 minutes. During instruction, some sort of interaction between the teachers and the

Parental Attachment Its Impact On The Mental Health Of Children

Dr. Sampa Ray Bagchi

Assistant Professor, Dr. Kanailal Bhattacharyya College.

Ramrajatala ,Howrah -4

mail id:raybagchisampa2005@gmail.com M 9836569066

ABSTRACT

Attachment Theories point out that children needs attachment to parents or parental figures which help them in the long term to adjust in life comfortably and safely, right from childhood. Parents should always remember that and make their children comfortable and happy.which lessens the pressure on childrens' tender minds. Children have many challenges in life like their ability to adjust in life, to acquire knowledge, to learn different skills, to choose their career and ultimately to settle in life. All these stages are not crossed smoothly as they have to overcome the hurdles like as of now to adjust to online system of learning, to perform and deliver good grades, to select leisure time activity, to get good grades in School and in Boards, choose their Future Career and so on. This constant pressure of doing and coping with all this have an impact on their mental health. If they have healthy upbringing, positive attitude in life, parental love and support ,belongingness, healthy habits they sail through life with positive outcome and is successful in their career and if not they some how sometimes loose in the rat race and suffer in life with negative outlook and fail to make a proper career of their own. In this study we aim to highlight some of the vital issues which might have a negative impact on childrens' mental health, and how to confront them so that positive mental health can be restored. For the analyses of the study some mental health journals,WHO Reports,Doctors Manual have been referred and some initiatives from health department with government, along with the parental support is addressed and some preventive measures have been suggested, to keep a child mentally healthy and happy. This will ensure in keeping a child mentally healthy and happy and contribute towards developing his/her positive outlook, attitudes in life which will in turn help him/her to becomea contributing,healthy happyand successful individual in the long run.

Keywords- Parental attachment, Child Mental health, Belongingness, Adjustment, Challenges, Healthy habits, Online Education,Performance,Career Building

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The current article aims to highlight the spatial pattern of the Quality of Life of the rural women in Haora district. Women are still vulnerable in the society, so their quality of life has become a key to the developmental issue and a challenging matter for framing the societal policy. Sixteen indicators have been considered in this paper for assessing their quality of life. Spatial variations of these indicators brought the spatial variations in the quality of life of rural women. Based on these variations, the status of the selected villages has been highlighted in this research paper also. The present study aims to find out the spatial variation in the quality of life of the rural women based on the variation in education, health, housing, employment, decision-making pattern, marriage and family-related issues.

Authenticated

(Dr. Kaustubh Lahiri)
Principal
Dr. Kanailal Bhattacharyya College

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Role of plants in mitigating pollution: A case study

Dipu Samanta[1*] and Samadrita Deb[2]

[1*]Department of Botany, Dr. Kanailal Bhattacharyya College, Howrah-711104 (India)
[2]Ex student, Department of Botany, University of Calcutta, Kolkata-700073 (India)
*For correspondence dipusamanta2010@gmail.com

Abstract

Now a day, pollution is the serious threat or issue for the environment. Human activities, deforestation, civilization, mining, industrial wastes, burning of fossil fuels, use of chemicals in agricultural purposes, arbitrary use of plastics are some main reasons for pollution. All these environmental pollutionsare divided into several categories such as air pollution, water pollution, soil pollution, noise pollution, radioactive and thermal pollution. It has detrimental effects on the environment, including the life of all living beings. Plants are the bio-mitigator of environmental pollution. Green plants are the lungs of the earth. They absorb carbon dioxide from the air and release oxygen for their own photosynthetic purposes which in turn paramount for the survival of living beings. Not only known as natural oxygen generating factories, plants can also absorb dust, radiation and purify the air. *Aloe vera*, English ivy, *Areca* palm, Spider plant and bamboo palm are good air purifier. *Eichhornia crassipes* has the bio absorption capacity to clean industrial wastewater. Many plant species have the potential to absorb heavy metals from soil and water. Scientists call sunflower plants as hyperaccumulators which can absorb radioactive waste through roots and store in stems and roots. Trees and shrubs are able to mitigate noise pollution. Tree belts of *Pinus brutia* have the largest capacity of reducing noise pollution. Plants improve soil fertility and water quality, reduce soil erosion, purify and clean air. Planting trees is the ultimate way to get rid of pollution naturally from the Earth. A small case study has been incorporated to establish the fact in general.

Plants play an important role in life on Earth. We get several things from the plants. They have immense importance to the environment. They act as producers of ecosystem services. Not only that, but they are the main controllers of all types of environmental pollution. Several pollutions such as air pollution, water pollution, noise pollution, soil pollution, thermal and radioactive pollution have harmful effects on our surrounding environment. Pollutions harm human and animal health also. Climate change is taking place due to pollution and temperature is increasing rapidly. Storms, cyclones, droughts,

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Self Rehabilitation in the face of Natural Hazards - a case study of Pakhiralaya, Gosaba Block, West Bengal

Karabi Das* and Dr. Kanailal Das[2]

[1]Assistant Professor, Department of Geography, Dr. Kanailal Bhattacharyya College, Howrah, West Bengal
[2]Faculty, Parameswar Mahavidyalaya, South 24 Parganas, West Bengal

* Corresponding Author

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Abstract

The Indian Sundarban (21° - 22°30'N, 88° - 88°29' E), comprising of 19 community development blocks (6 in North 24 Parganas and 13 in South 24 Parganas) is physiographically a deltaic plain, having an intricate network of creeks. The area is remote in comparison to Kolkata, a leading metropolitan city of India and houses about 4 million people engaged in monocropping and other minor occupation. Pakhiralaya, of Gosaba community development block works as a transit to the trips to Sajnekhali, Sudhanyakhali, Dobanki and Netidhopani and has many tourist lodges and resorts. Land prices have seen a hike after the advent of tourism in the area. The rural economy is thus changing owing to the advent of tourism. The construction of resorts has deforested the area leading to loss of various birds which used to stay at Pakhiralaya and thus gave its name. While the young people opine that tourism is good because some are getting jobs based on tourism, the aged opine that cultural and social changes have come up due to tourism and often tourism influences the society badly. Dreamed by the rivers, the earthen embankments of the area have succumbed to the dashing of river water robbing the settlements. Once a forested stretch, some areas of Pakhiralaya were reclaimed in the year 1969. Repeated embankment breaching has caused a settlement shift to interior locations. Ravaged by Aila, the agriculture of the site has been hit hard and people are burdened with a shift in their occupations. This paper addresses the change in employment and livelihood followed by that of settlement after cyclones like Aila and Amphan through oral history. Google Earth imagery has been considered for years 2003, 2016 and 2020 and it has been found that towards Bali, embankments have breached up to 51.8 meters and 94.4 meters while towards Dayapur this breaching is up to 81.8 meters. The concept of self rehabilitation of the people without the help of the government and NGO's has been brought out in this paper.

Introduction

The Indian Sundarban forms a part of the single largest halophytic system of the world. Extending from 21°N - 22°30' N and 88°E - 88°29'E, it comprises of 102 islands in total of which 54 are inhabited. The principal rivers from West to East are Hooghly, Saptamukhi, Thakuran, Matla, Bidya, Gosaba and Jhilla Raimongal. The tropical dry and wet climate of the region is influenced by seasonal monsoon winds and maritime actions of the Bay of Bengal. The coastal region experiences heavy rainfall and humid climate due to its proximity to the sea. The summer temperature ranges from 29°C to 38°C. A type of thunderstorm known as Norwester prevails then. Three major divisions of soil can be found in the Indian Sundarban. These are: fine silty clay in the northernmost part, silty loam in the middle portion, and swampy areas towards the coast with sandy clay and sand dunes

The livelihood of 4 million inhabitants of Indian Sundarban revolves around the extraction of resources from forests and creeks apart from agriculture. Earthen embankments were erected to protect the people and agricultural fields from the saline water of the tidal rivers. The embankments also hold back high tides experienced twice daily. "It is estimated by the forest officials of both countries that around 300 islanders in West Bengal and Bangladesh are killed each year by tigers and crocodiles alone." (Jalais, 2007). Monocropping is predominant in Sundarban as the saline river water is unsuitable for cultivation. Premature reclamation in the form of raised embankments has resulted in the reduction of spill areas of the rivers. The sediments are thus deposited on the riverbed itself and the floodplain remains devoid of sediments. Thus, in Sundarban, the settlements are at a lower level than the rivers and are liable to flooding (Das et al., 2016). The Indian Sundarban

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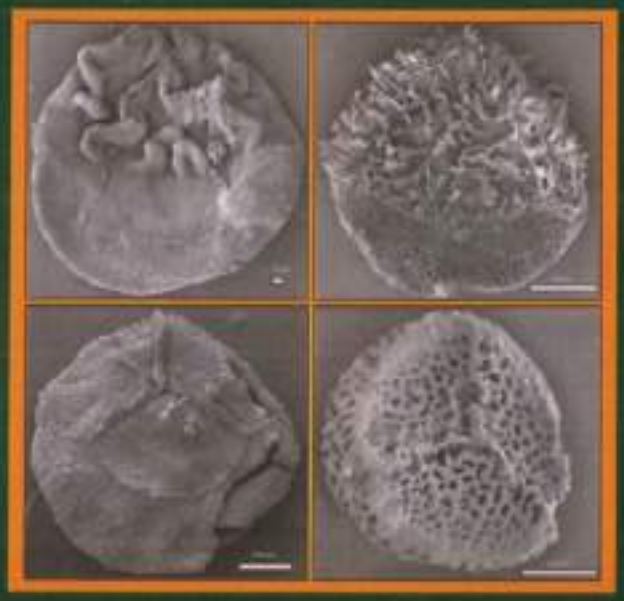

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Taraknath Palit Siksha Prangan,
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SHORT COMMUNICATION

Mangrove and molluscs association in Indian Sundarbans

Arundhati Ganguly[1,3]*, Dipu Samanta[2]*, Ananya Sarkar[1], Susanta Kumar Chakraborty[3]

[1]Department of Environmental Science, Asutosh College, Kolkata- 26

[2]Department of Botany, Dr. Kanailal Bhattacharyya College, Howrah- 4

[3]Department of Zoology, Vidyasagar University, Midnapore

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Mangrove is a tree, shrub, palm or ground fern, generally exceeding a one-half metre in height and normally grows above sea level in the intertidal zone of tropical and subtropical coastal environments and along estuarine margins (Duke, 1993). Mangroves are tolerant of salt and saturated soils making them unique. These plants are important worldwide providing essential habitat for diverse faunal life and the most productive ecosystem. The detritus-based food web supplies nutrients to the marine ecosystems and also protect shorelines from severe cyclonic storms, coastal flooding and erosion from large waves. They filter and clean coastal waterways and are known as "coastal kidneys" (Wigand *et al*., 2021). They supply timber, honey, tannin, medicines and are rich in a variety of finfish, shellfish resources to the human communities.

Sundarbans is the largest active river-delta region of the world consisting of 102 islands separated by seven major riverine estuaries- Muriganga, Saptamukhi, Thakuran, Matla, Gosaba, Bidyadhari and Raimangal –Harinbhanga with networks of narrow channels and tidal inlets. Mangroves of the Sundarbans have a certain magical and transcendent quality to cope up with different dynamic environmental forces.

Sundarbans ecosystem harbours 34 true mangrove species (Chaudhuri and Choudhury, 1994) and 40 mangroves associates species (Chakraborty, 2019) and some mesophytic invasive species (Bhakat *et al*., 2004) which are mainly observed in human-altered regions.

Complex geomorphological settings with sea-level rise, saltwater intrusion has shown potential impacts on *Heritieria fomes, Nypa fruticans* to decline from Indian Sundarbans and shifting to Bangladesh part of Sundarbans as they are low salinity indicator species. *Avicennia* and *Rhizophora* can grow in a high saline environment and are popular in toe-line afforestation programme in Indian Sundarbans. *A. marina* (Forssk.) Vierh (Jat bain) and *A. officinalis* (Piyara bain) commonly grow on the riverbank of the upstream, middle and downstream part of the tidal and subtidal belt whereas *A. alba* Blume (Kalo bain), mostly found in the downstream to middle stream part. *Rhizophora apiculata* Blume grows in the middle and upstream estuarine regions whereas *R. mucronata* Poir. grows in the middle and downstream parts of the macro tidal environment.

**Corresponding author* : arundhati.jee.2009@gmail.com
dipusamanta2010@gmail.com

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Plants for Soil pollution Control: A Review

Dipu Samanta[1*], Samadrita Deb[2] and Debabrata Das[3]

[1*]Department of Botany, Dr. Kanailal Bhattacharyya College, Howrah-711104 (India)
[2]Ex-postgraduate student, Department of Botany, University of Calcutta-700073 (India)
[3]Department of Botany, Lalgarh Government College, Jhargram-721516 (India)
*For correspondence
botany2020kbc@gmail.com

Abstract

Environmental pollution is the abnormal change and catastrophe of the environment and its components as a result of human activities. Soil pollution is a serious issueamong all types of environmental pollution as it is associated with health risks via the food chain. Several managements or methods have been taken for preventing soil pollution. The process of soil purification through trees is the most acceptable and eco-friendly and how the plants help to prevent soil pollution and its methods are discussed below.

Soil, the upper layer of the Earth, is the main and natural medium for plant growth. It is composed of minerals (45%), organic matter (4%), soil water (25%) and soil air (25%). It is the most important natural resource that helps us to survive. But several human activities such as industrialization, urbanization, wrong disposal methods of waste materials, including radioactive wastes, use of additional chemical fertilizers, the inappropriate use of plastic materials are speeding the process of soil contamination. Heavy metals, petroleum hydrocarbon, herbicides, pesticides, asbestos, plastics, chemical fertilizers, radioactive waste, waste materials are the main pollutants for soil contamination. Soil pollution is a major problem for us because polluted soil has adverseeffects on the environment and the health of living beings.It is very important to prevent soil pollutionto maintain the balance of the environment.Preventing soil contamination is essentialto protect the health of living beings. And in this case,the contribution of trees in preventing soil pollution is undeniable.

Soil pollution control methods using plants:

A. There are several ways to lowersoil pollution followed in the agricultural system.

i) ***Crop rotation:*** It helps to increase soil fertility, reduce soil erosion and improve soil structure. It also reduces soil-bornepathogens, nematodes and weeds[19]. Three successive corn crops (*Zea mays*)

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Geographical Report

Problems of Rural Housing and Quality of Life in Haora District: An Overview

Sutapa Mukherjee (Pal)
Dr. Kanailal Bhattacharyya College, Howrah, India
(Corresponding author: sutapamukherjee2020@gmail.com)

Abstract

Housing is one of the vital aspects of Quality of Life and it plays a significant role in the socio- psychological development of an individual. The focus of the paper is on some aspects of housing like overcrowding, lack of privacy of the currently married couples, lack of sanitation facilities, sources of drinking water, sources of fuel for cooking and lack of LPG usage by the rural women in the study area. Spatial pattern of overcrowding, sanitation facilities, and privacy of the currently married women have been reflected through the paper. Statistical and cartographical analysis are showing the spatial variation in housing that has brought the spatial variation in quality of life also

Keywords: Housing, Quality of Life, Habitation Density, privacy of couples, sanitation, Sources of drinking water, fuel types

Introduction

World Health Organization has defined Quality of Life as "the condition of life resulting from the combination of the effects of the factors such as health, happiness (including comfort), education, social and intellectual attainments, freedom of action, justice and freedom of expression" (Park, 2009, 16).

Seven general criteria of 'Social Well–being' like income, wealth and employment, the living environment (housing, physical environment, neighborhood), health, education, social order and social belongings, recreation and leisure are most important measures of quality of life which was highlighted by Smith (Smith, 1977, 74–75). Housing is one of the vital aspects of the quality of health of a human being. It includes not only the 'physical structure' providing shelter but also the immediate surroundings and the related community services and facilities. It has become part of human settlement in which a group of people reside and pursue goals of their life (Park, 2009, 656).

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A STUDY OF CHOICE OF DECISION-MAKING AND ITS IMPACT ON POLITICAL PARTICIPATION AMONG WORKING WOMEN IN SELECT FORMAL AND INFORMAL SECTORS: A CASE STUDY OF SOUTH KOLKATA.

ANASUA CHATTERJEE.
Associate Professor.
Department of Political Science.
Dr. Kanailal Bhattacharyya College, Howrah. West-Bengal. India.

ABSTRACT

Women's role in the development process cannot be ruled out. However, in this society, women are commonly constrained by the norms, beliefs, customs and values of the society creating separate codes of conduct for women and men. The main purpose of the present study is to understand the pattern of decision-making choice of the working women. aims to study her cognitive orientation (i.e. her knowledge about political parties, symbols, their stay in power and their judgements about political system), evaluative orientation on how political system works including her voting behaviour and partisan preference. Women working in both the organised and the unorganised sectors play dual role looking after their children, elders in the family, husbands and also contribute to the family expenditure but have no control over their own income or expenditure. They consult their husbands, elder members of the family or the community before casting their vote and are not guided by individual preference or choice. Women do not yet exist as an effective political collectivity.

INTRODUCTION

Political participation is a complex phenomenon liable to be influenced by different variables. It denotes a series of activities which have a bearing on the political process. To be more specific, these activities mainly are (1) voting at the polls, (2) supporting possible pressure groups by being a member of them, (3) personally communicating directly with legislators, (4) participating in political party activity and thus acquiring a claim on legislators, (5) engaging in habitual dissemination of political opinion through face-to-face communication with other citizens. However, it is to be noted that more people discuss politics than vote, and many more vote than join parties or work in campaigns (Woodward, 1972, 133). Some other empirical studies also show that most people are just not especially politically oriented and political participation is not a "natural" concomitant of citizenship. As Eakin's (1972, 97) study, based on survey research, shows that only small percentages, probably fewer than 10 per cent in all democratic countries, belong to a political class. Milbrath (1965,25-60) suggests that "the various forms of political involvement fall into a hierarchy or continuum according to the cost in time and effort that each

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The Sundarban region is a highly dynamic ecosystem, which has been formed and modified by continuous sediment input from rivers Ganga and Brahmaputra, intense tidal hydro-dynamics, climatic disturbances and anthropogenic activities. Sundarban region has been modified by strong tides, longshore currents, waves through sediment reworking, erosion and deposition. Indian Sundarban has been facing a series of dynamic situations which have shaped its vulnerabilities over the years. Indian Sundarban is physiographically a deltaic plain, intricately surrounded by creeks and rivers. Aila to Yaas, Sundarban has faced a legacy of destruction in a decade and every time the embankments have faced massive destruction, resulting in subsequent saltwater inundation. This paper addresses the various vulnerabilities of Sundarban in the light of cyclones Aila to Yaas and the mitigation strategies are undertaken by local inhabitants, various governmental and non-governmental organizations.

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Aila to Yaas: Legacies of Destruction, Case Studies from Selected Sites of Indian Sundarban

Karabi Das*, and Dr. Kanailal Das†

*Assistant Professor, Department of Geography, Dr. Kanailal Bhattacharyya College, Howrah, West Bengal, India
†Faculty, Paramanpur Mahavidyalaya, Namkhana, South 24 Parganas, West Bengal, India

*Corresponding Author

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Abstract

The Sundarban region is a highly dynamic ecosystem, which has been formed and modified by continuous sediment input from rivers Ganga and Brahmaputra, intense tidal hydro-dynamics, climatic disturbances and anthropogenic activities. Sundarban region has been modified by strong tides, longshore currents, waves through sediment reworking, erosion and deposition. Indian Sundarban has been facing a series of dynamic situations which have adapted to vulnerabilities over the years. Indian Sundarban is physiographically a deltaic plain, intricately surrounded by creeks and rivers. Aila to Yaas, Sundarban has faced a legacy of destruction on a decade and every time the embankments have faced massive destruction, resulting in subsequent saltwater inundation. This paper addresses the various vulnerabilities of Sundarban in the light of cyclones Aila to Yaas and the mitigation strategies are undertaken by local inhabitants, various governmental and non-governmental organizations.

Introduction

The Sundarban region is a highly dynamic ecosystem, which has been formed and modified by continuous sediment input from rivers Ganga and Brahmaputra, intense tidal hydro-dynamics, climatic disturbances and anthropogenic activities. Sundarban region has been modified by strong tides, longshore currents, waves through sediment reworking, erosion and deposition (Chakrabarti, 1995; Bandyopadhyay et al, 2004; Raju et al, 2010; Jana et al, 2012; Chakraborty, 2013; Das et al, 2013; Addo, 2015). Sundarban is characterized by a flat, sandy beach, tidal marsh, mudflats and intricate network of creeks (Paul, 2002; Das, 2006). The shift of river Ganga towards the east has rendered the western part of the delta, devoid of sediment supply.

The western part of the Ganga Brahmaputra delta is retrograding in nature and the sediments brought get bypassed into the Swatch of No Ground submarine canyon. Loosely attached sediments were auto compacted; also land subsidence was another important geomorphic event (Chakrabarti, 1995; Islam et al, 1999; Stanley and Hait, 2000; Goodbred et al, 2003; Alam et al, 2003). By comparing the topographical maps and satellite images, it is found that the reclaimed portions record notable and persistant coastal erosion while the non-reclaimed portions are either accreting or ephemeral in nature.

The Bay of Bengal basin records the highest number of tropical cyclones globally. The frequency of cyclones has increased from 20 (1991-2000) to 39 (2001-2009). About 8 storms with a sustained wind speed of more than 63 km/hr form in the Bay of Bengal each year. Of these, on an average, two become tropical cyclones. Mangroves act as a biological shield against such storm surges (Sen, 2021).The Indian Sundarban forms the single largest halophytic system and isannually ravaged by tropical cyclones, embankment breaching and salrwater inundation.

Objectives

The main objectives of the paper are

1) To study the extent of loss and destruction caused by cyclones Aila, Bulbul, Amphan and Yaas over the Indian Sundarban.
2) To suggest probable mitigation strategies to cope up with the destruction caused by these phenomena.

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Impact of Education on Quality of Life of the Rural Women in Haora District : Some Observations

Sutapa Mukherjee

Assistant Professor, Dr. Kanailal Bhattacharyya College

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ABSTRACT

Education of women is the most important influencing factor of quality of life. In the study area rural women are less educated than the male members in the family. The study shows that most of the rural people do not believe in higher education of the girls, marriage is considered the ultimate goal of the women. Less education and lack of political awareness among the rural women is a great limitation in the study area. Lower literacy rate and higher fertility rate have brought poor quality of life. Early marriage, occurrence of domestic violence, lack of freedom of mobility, freedom of expression and lack of decision making power of the women have affected their quality of life adversely. The present paper is highlighting the correlation between education and these parameters of QOL with the help of suitable maps and diagrams.

Introduction:

World Health Organization has defined "Quality of life" as "the condition of life resulting from the combination of the effects of the factors such as health, happiness (including comfort), education, social and intellectual attainments, freedom of action, justice and freedom of expression" (Park, 2009, 16).

The 1948, the Declaration of Human Rights stated that everyone has a right to education. In economic and social development education is a crucial element (Park, 2009, 416).

In the Indian society women's' roles are restricted to the domestic arena. Education is considered to be of marginal importance. This is based on the perception of roles which are prescribed for women. Marriage is the main purpose of their lives so education is geared towards making them good mothers, wives and daughters–in–law (Sengupta, 2000, 113–114).

Political representation is one of the most important conditions in liberal democracy. The Women's Reservation Bill must empower women to raise their situation politically. Implementation of reserved quotas for women in legislatures and parliament is needed to restrict the under-representation of women. Ensuring equal participation of men and women in decision making process such effective implementation is also needed (Heredia, 2012, 51).

Higher educational attainment have better health and lifespan compared to their less educated peers. Education can influence in reducing child mortality rate and can increase life expectancy. Education can reduce inequalities and can improve health. At the grass root level education create self awareness on personal health and making health care more accessible (Raghupathi, 2020).

Domestic abuse is a social issue of concern to individuals and policymakers. Abusive relationship are characterized by a "cycle of violence" where tension builds up until violence occurs, the abusive husbands repents so his wife stays in the marriage and the process repeats itself with increasing violence.

Correspondence to Sutapa Mukherjee
Assistant Professor, Dr. Kanailal Bhattacharyya College
E-mail address: sutapamukherjee2020@gmail.com