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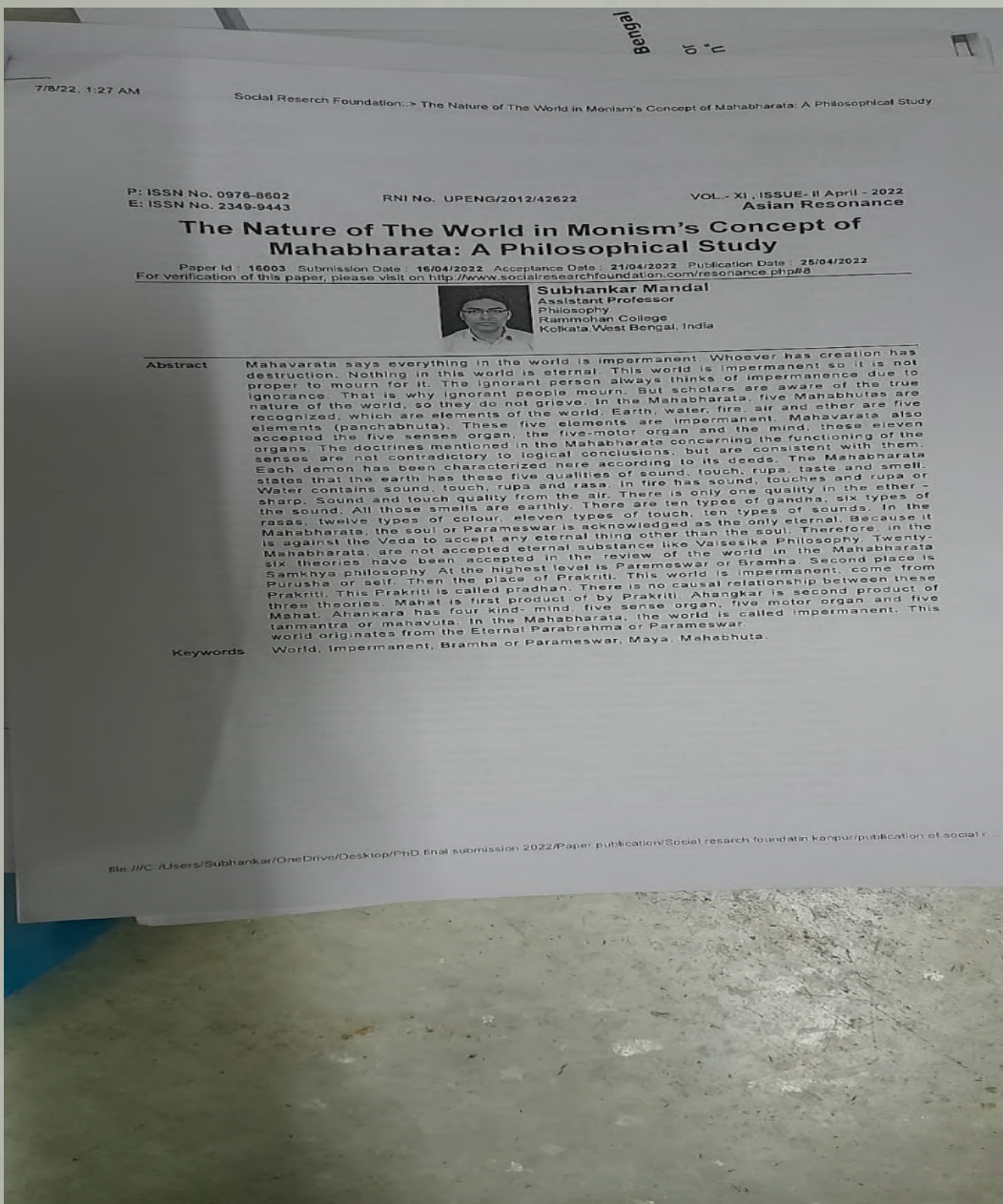
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Year 2022

Date 20

Name of the teacher: Dr. Subhankar Mandal

Title of paper: The Nature of The World in Monism's concept of Mahabharata: A Philosophical Study



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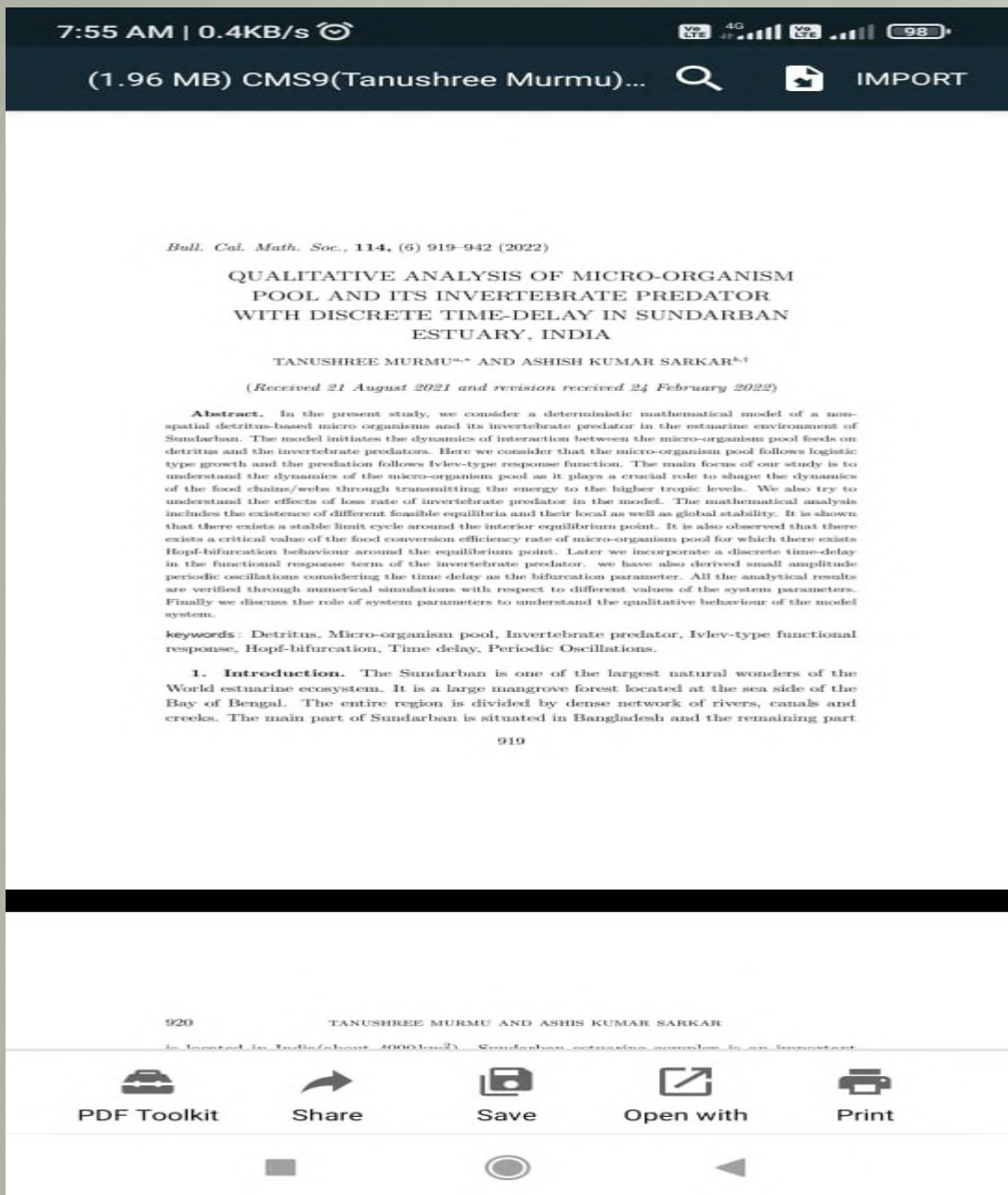
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Year 2022

Date 20

Name of the teacher: Tanushree Murmu

Title of paper: QUALITATIVE ANALYSIS OF MICRO-ORGANISM
POOL AND ITS INVERTEBRATE PREDATOR WITH DISCRETE
TIME-DELAY IN SUNDARBAN ESTUARY, INDIA



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Year 2023

Date 20

Name of the teacher: Dr. Samik acharjee

Title of paper: In-vivo Thermal Stress Induces Melatonin Receptors and Heat Shock Proteins Expression in the Spleen of Mice in a Time and Temperature Dependent Manner.

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ISSN 1997-0838

ORIGINAL ARTICLE



***In-vivo* Thermal Stress Induces Melatonin Receptors and Heat Shock Proteins Expression in the Spleen of Mice in a Time and Temperature Dependent Manner.**

Samik Acharjee¹, Shiv Shankar Singh^{2*}

¹ Department of Zoology, Rammohan College, Kolkata-700009; West Bengal, India.

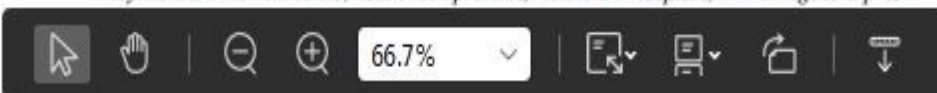
² Molecular Endocrinology Research Laboratory, Department of Zoology, Tripura University, Suryamaninagar – 799022, Tripura (W), India

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Received March 30, 2023

Heat shock proteins (Hsps) responses against stress conditions. Melatonin completes its stress relieving activities via its MT1 and MT2 receptors. The present study delineates the expression pattern of Hsp70/Hsc70 and MT1/MT2 receptor proteins along with the AANAT gene expression in the splenic tissue of mice subjected to hyperthermic stress in a temperature dependent and time dependent manner. *In vivo* thermal stress resulted increase in expression of Hsp70, Hsc70 and MT2 receptors proteins in both temperature dependent and time dependent manner. Optimum heat exposure at 43°C and maximized Hsps expression was observed after 5 hours of heat exposure. Heat stress caused increase in AA-NAT gene expression of the splenic tissue resulted in the synthesis of melatonin which might act as signal molecule for upregulating the activity and rise of the stress responsive genes and proteins like: Hsp70/Hsc70, whereas simultaneous increase of MT2 expression shows its possible involvement in such mechanism.

Key words: Thermal stress, heat shock proteins, melatonin receptors, AA-NAT gene expres-



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Year 2023

Date 20

Name of the teacher: Dr. Samik Acharjee

Title of paper: Ethnomedicinal Knowledge of Bishnupriya Manipuri Community of Unakoti District of Tripura, North East India



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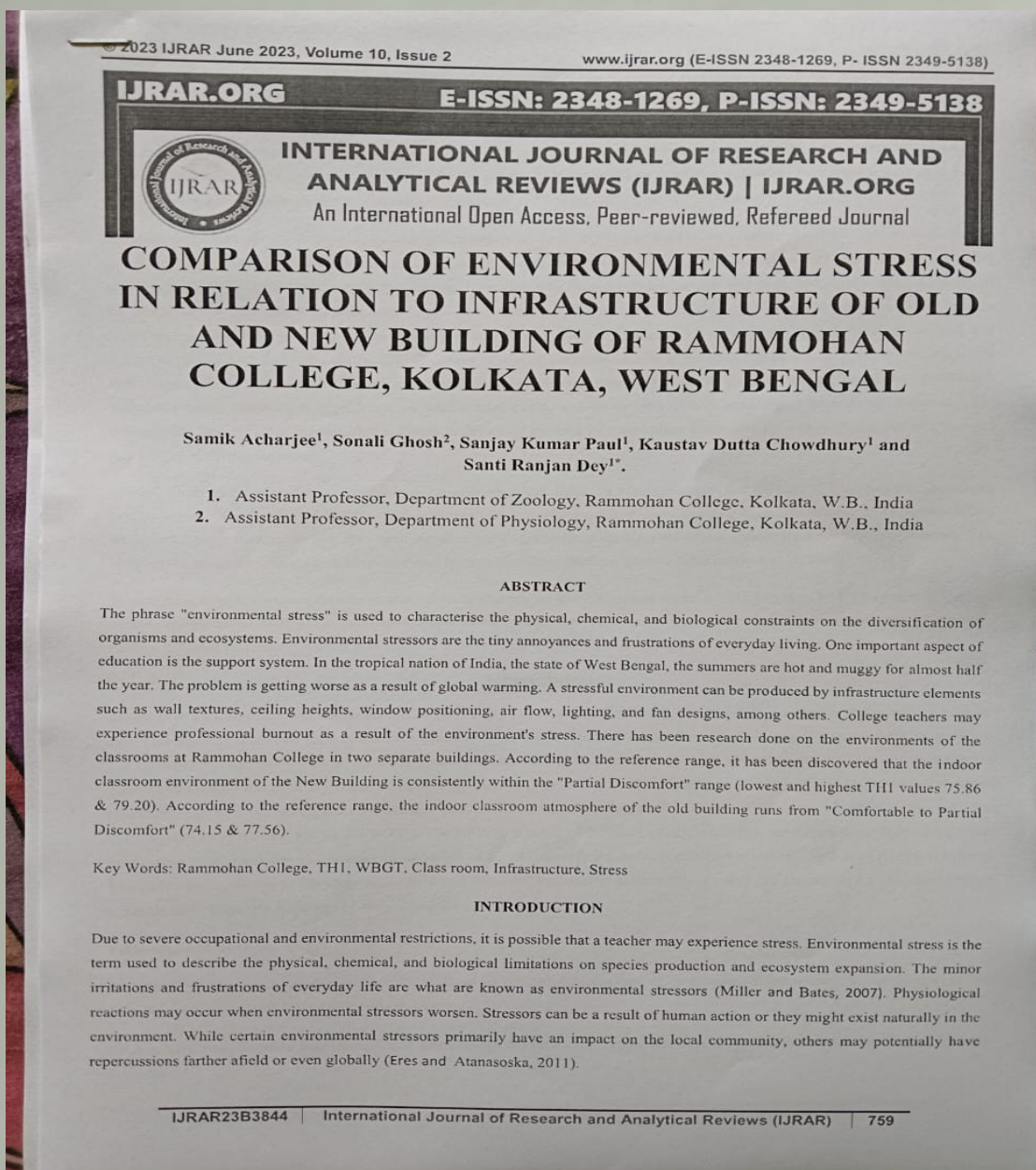
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Year 2023

Date 20

Name of the teacher: Dr. Samik Acharjee

Title of paper: Comparison of environmental stress in relation to infrastructure of old and new building of Rammohan College, Kolkata, West Bengal.



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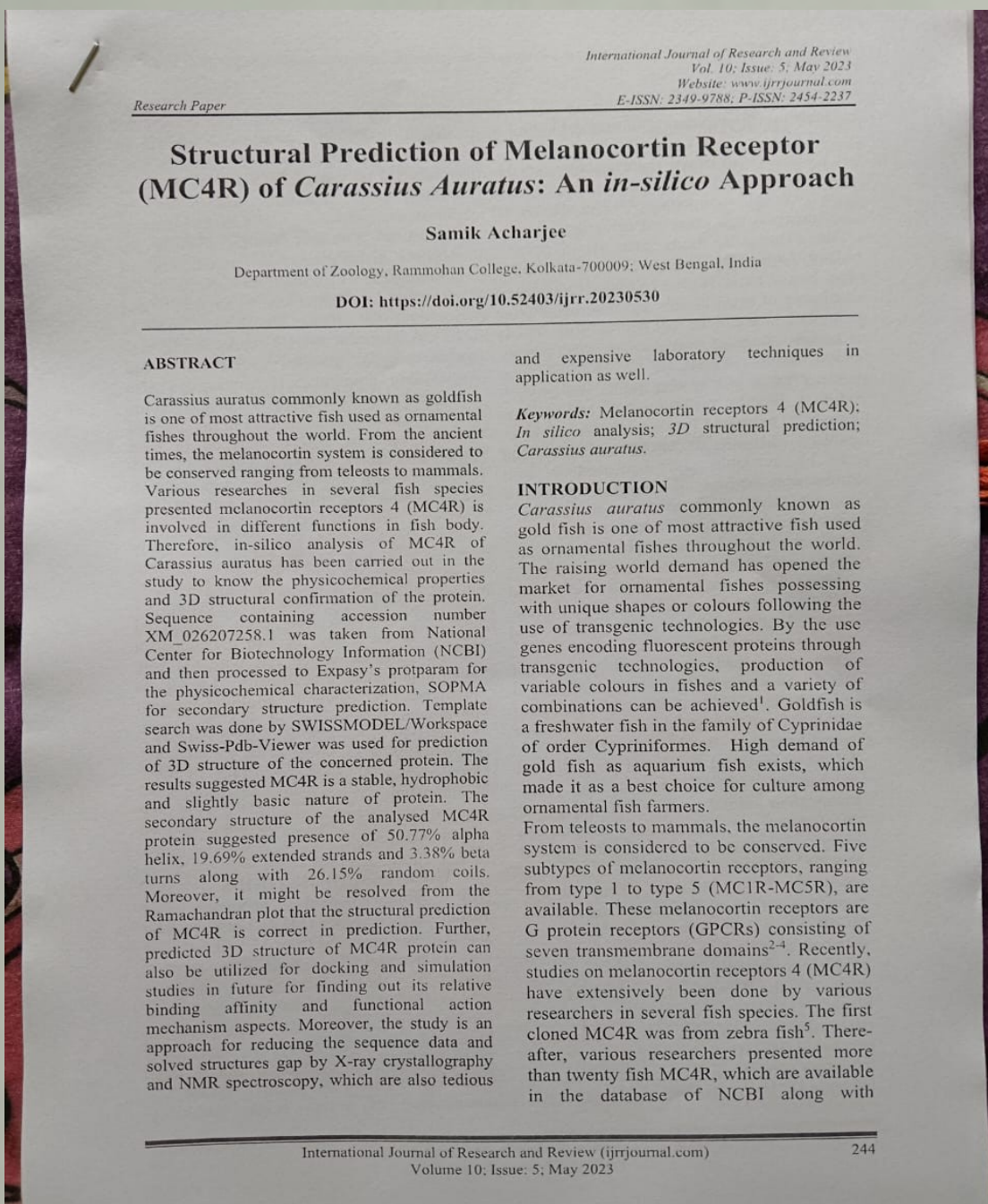
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Year 2023

Date 20

Name of the teacher: Dr. Samik Acharjee

Title of paper: Structural Prediction of Melanocortin Receptor (MC4R) of *Carassius Auratus*: An in-silico Approach.



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Year 2023

Date 20

Name of the teacher: Dr. Shrabani Sen

Title of paper: NON LINEAR DYNAMICS OF CHEMICAL AND BIOLOGICAL OSCILLATORY SYSTEMS

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NON LINEAR DYNAMICS OF CHEMICAL AND BIOLOGICAL OSCILLATORY SYSTEMS
Dr. Shrabani Sen^{*1}
^{*1}Department Of Chemistry, Rammohan College, 102/1, Raja Rammohan Sarani, Kolkata 700009, India.
DOI : <https://www.doi.org/10.56726/IRJMETS33444>

ABSTRACT
Our object in this chapter is to outline a brief overview of the background theories needed for understanding a number of far-from-equilibrium phenomena, such as chemical oscillations, patterns, spirals, targets and so on. Oscillations are ubiquitous in chemical and biological systems. Every living system contains hundreds of chemical and biological oscillators. The systematic study of oscillating chemical reactions is a fundamental area of research in nonlinear chemical dynamics. We start with a brief overview of some history of chemical oscillations followed by the basic thermodynamics and stability analysis including the phase plane representations.
Keywords: Stability, Fixed Point, Thermodynamics, Far From Quilibrium Process, Oscillations.

I. INTRODUCTION
Dynamics
Dynamics is a subject that explains how a physical variable of interest changes with time. Harmonic oscillation is a typical paradigm of linear motion. A conspicuous feature of this motion is that the frequency of the oscillator is independent of its amplitude. When the system is nonlinear its motion is more complicated because of the dependence of frequency on amplitude as a result of which the motion may vary from purely periodic to aperiodic manner (Epstein 1998, Hilborn 1994, Strogatz 1995). Although nonlinear dynamics owes its origin in Physics to Newtonian dynamics developed in mid-1600s for solving classic two-body problem, it is treated as an interdisciplinary subject today (Epstein 1998, Golbeter 1996, Murray 1993). With such an early development, the subject found a very little applicability because the three-body problem was beyond the scope of the method developed by Newton at that time. It crossed this barrier when Poincare succeeded in developing a powerful geometric approach to analyze such problems. His discovery forms one of the fascinating areas of nonlinear dynamics today which has widened its scope in the first half of the last century and the study of nonlinear oscillations found widespread applications in almost all branches of science starting from physical science to chemistry and biology. During the last decades of the nineteenth century Lyapunov's results on the stability theory broke new ground for subsequent development of this field. The theory of nonlinear dynamics is now applied to many scientific disciplines: mathematics, computational science, microbiology, biology, economics, engineering, finance, philosophy, physics, politics, population dynamics, psychology, and robotics (Jalan et al, 2005). Non-linear dynamical behavior has been observed in the laboratory in a variety of systems including electrical circuits, lasers, oscillating chemical reactions, fluid dynamics, and mechanical and magneto-mechanical devices, as well as computer models of chaotic processes. Observations of chaotic behavior resulting from nonlinear characteristics in nature include changes in weather, the dynamics of satellites in the solar system, the time evolution of the magnetic field of celestial bodies, population growth in ecology, the dynamics of the action potentials in neurons, and molecular vibrations. With all these aforementioned list of examples nonlinear dynamics is now gradually expanding its horizon and as a result it is a major field of research interest nowadays.

II. OSCILLATIONS
Our objective here is to gain some more insight into the nonlinear chemical dynamics of oscillatory systems. Oscillations can be both temporal and spatio-temporal in nature. The word temporal signifies homogeneous oscillation in space and the word spatio-temporal implies coupling the temporal part with the spatial part through diffusion. A chemical or biological oscillation is a rhythmic far-from-equilibrium process. A casual look at the history of nonlinear chemical dynamics reveals that the development of the subject had to go a long way
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to establish that there is no conflict between second law of thermodynamics and chemical oscillation. The long-standing confusion arose from the discovery of Belousov (Belousov 1955) which led to its initial rejection was subsequently clarified by the work of Zhabotinski (Zhabotinski 1964). This made possible for this far-from-equilibrium phenomenon to expand its horizon to different branches of chemical science with its versatile

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Ref. Year 2023 Date 20

Name of the teacher: Dr. Debjane Ganguly
Title of paper: A Gendered Pandemic in India, Nepal and Bangladesh

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International Journal of Science and Research (IJSR)
ISSN: 2319-7064
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A Gendered Pandemic in India, Nepal and Bangladesh

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Abstract: Impact of Covid-19 has been felt very differently by women across the globe. We saw a rise in the number of cases of domestic violence in the world over, women suffered much more in terms of job lay-offs, they have continued to face discrimination in terms of re-employment, lower wages and continue to be at a greater risk of contracting the virus as most of them are engaged in frontline health work. In this new context of strict lockdown (in most countries), weakened or battered economies and fear of a repeat scenario, this paper looks at South Asia and the impact of covid-19 on women, their rights, their struggle for reclaiming the public space and the sacred space of the household. South Asia makes for a unique study given its deeply rooted patriarchal attitudes that have kept women confined mostly in the home or engaged in gender-based jobs. South Asia has a poor track record of women's rights, gender-based crimes and gender-stereotypical attitude in society. According to the Global Gender Gap Report, among the eight regions covered in the report, South Asia ranks the lowest, with only 62.3% of the gender gap closed in 2022. This lack of progress since the last time that the study was conducted means that it will take the region 197 years to close the gender gap, due to a broad stagnation in gender parity scores across most countries in the region. This paper looks closely at the impact of covid-19 on women in three South Asian countries, India, Nepal and Bangladesh. I will be looking at covid-19 and rise in crime against women in the space of the home and otherwise, labour force participation rate among women and related economic disparities that have been accentuated after the pandemic, impact on civil society and if and how governments of these countries have addressed the issue. It will be a comparative study among these countries on the gendered impact of the pandemic. The aim of the paper is to highlight the cause of women in a new global context of the pandemic and crippled economies.

Keywords: Labour participation, domestic violence, sexual harassment, gender-based violence, laws

1. Introduction

A study of the gendered impact of Covid-19 on three South Asian countries which are any way riddled with an age old disease like patriarchy seems like a plot of a horror movie. Globally Covid-19 has deepened the gender divide, escalated gender based violence rates, sharpened gender-based roles and isolated women and girls even further. South Asia has been no exception to this trend. South Asia is infamous for its deeply patriarchal attitude, gender crimes rates, female feticide, dowry deaths and the like. While this paper is a commentary on impact of the pandemic on women, it should be borne in mind that Nepal, Bangladesh and India have traditionally scored abysmally low in most gender scores irrespective of the pandemic. This fact has been brought out year after year in numerous surveys and reports, the latest being the WEF Global Gender Gap. While looking at each country specifically, there are some common indices during the lockdown and post it, like employment in informal sector, child marriage, girl-child education, domestic violence etc that we shall compare and contrast to highlight the impact of the pandemic.

The Global Gender Gap 2022 is a global study of gender parity left to be achieved by countries. Regionally, South Asia has performed the worst. South Asia has the widest gender gap on Economic Participation and Opportunity, having closed only 35.7% of this gender gap. While the sub-index score is an improvement of 1.8 percentage points from last year, varied countries in the region have performed differently anchoring the result as the lowest among all regions. The highest score of Nepal stands at 64.1%. Increases in the share of women in professional and technical roles were most notable in Nepal, Bangladesh and India. On the other hand, the shares in Iran, Pakistan and Maldives regressed, with less impact on overall regional performance. India and Sri Lanka have progressed on closing the gender gap in the share of women in senior positions as well, while Iran has regressed. [1]

In comparison to other regions, South Asia ranks second lowest on the Educational Attainment sub-index, above Sub-Saharan Africa. Literacy rate, one of the core indicators for education, saw no change in five countries. However, there were losses in literacy parity in Afghanistan (10.3 percentage points) and in lesser measure, in Bangladesh (-0.3 percentage points). All countries for which data is available have closed more than 98% of their gender gap in enrolment in primary education. [2]

South Asia has one of the lowest regional gender parity scores for Health and Survival, at 94.2%. Sex ratio at birth remains relatively low in large, populated countries such as India and Pakistan, whereas Bangladesh, Bhutan, Iran and Sri Lanka have reached parity. South Asia has the fourth-highest regional performance on the Political Empowerment sub-index, having achieved 26.3% of gender parity. The highest-ranking countries in the region within this dimension are Bangladesh, India and Nepal, where women have held the highest office in the country or participate more widely in government. The lowest-ranking countries on this sub-index are Bhutan and Iran. [3]

Drastic cuts in the availability and use of essential public health services across South Asia due to COVID-19 may have contributed to an estimated 228,000 additional child deaths in 2020, according to a new United Nations Report. It is expected that there would be 11,000 additional maternal

deaths due to the lockdown. [4] Some 420 million children in South Asia remain out of school due to pandemic control measures. The report warns that 4.5 million girls are likely to never return to school, and are at particular risk due to deteriorating access to sexual and reproductive health and information services. [5]

Excessively low female labour force participation rates are especially evident in the Arab States and South Asia. This suggests deep-rooted obstacles to women's economic empowerment and gender equality. Even if women's economic opportunities have generally improved, women's access to decent work remains elusive. Women continue to be over-represented as contributing family members in low-

According to a recent survey on the labour market conducted by the ILO, Nepal's labour force has lost anywhere between 1.6 and 2 million in the current crisis, either with complete job losses or reduced working hours resulting in decreased wages. [10] In Nepal, a total of 631,000 female jobs (24.3% of the 2018 female workforce) are estimated to be at risk in the higher impact scenario, compared to 1.5 million jobs for men (also 30.3% of the 2018 male workforce) (ILO, 2020). [11] 2

Women bore the brunt of job losses even in the informal sector. The effect was mostly observed in Nepali women who held pink-collar jobs or did un-paid household work. As a consequence of the perceived gender roles and

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Year 2023

Date 20

Name of the teacher: Mrs. Chayanika Roy

Title of paper: Freshwater fish parasite diversity in West Bengal- A review

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Freshwater fish parasite diversity in West Bengal – A review

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ABSTRACT

Aquaculture has the potential to meet the need of growing demand of fish in an affordable price. But in capture and in culture fisheries the fishes face diseases that interfere in the production of fish. The occurrence of disease causes the reduced production in aquaculture or reduce the marketable value of fish because of change of flesh quality, thus hampering the production. Freshwater fishes whether they are cultured or wild face different types of diseases in their skin, gills, fins, blood, and internal organs. The parasites that cause the diseases may be protozoans or metazoans. The main protozoan freshwater fish diseases are ichthyophthiriasis, trichodiniasis, costiosis, chilodonellosis. The most common metazoan parasitic diseases of freshwater fishes are dactylogyrosis, gyrodactylosis, argulosis, myxosporidiasis, ligulosis, ergasilosis, lemaesis, etc. The focus of this review is to screen the research studies that takes place on freshwater fish parasites of West Bengal. The review also aims to study the diversity of freshwater fish parasites in West Bengal, so that it will help the researcher to get an idea about the freshwater fish parasites and their mode of infection in the fishes. The research work that takes place in different regions of West Bengal. Some of them reveal new species of parasites in fishes. Protozoan, cnidarian, acanthocephalan, nematode, cestode, trematode, crustacean parasites are identified in freshwater fishes of West Bengal. Among the protozoans ciliates, flagellates are identified. Trichodinids are very common protozoan fish parasites in most districts. Parasites under genus *Myxobolus*, *Dactylogyrus*, *Gyrodactylus*, *Argulus*, *Lerneae* are common among the metazoans.

Key words : Fish parasites, Diversity, Protozoan fish parasites, Metazoan fish parasites.

Introduction

Fishes are the important source of protein containing food. For that reason, day by day demand of fish production increases in West Bengal. With the increasing demand of fish food production concern about the fish diseases increases in the farmers and in the researchers. Fishes are the source of earning for many people and it helps in the economic devel-

opment of our country by acting as a source to earn foreign money. Parasitic infestation frequently occurs in fish that causes retarded growth rate, reduced production, consumer rejection, low reproduction and mass mortality in fish. There are many parasitic diseases of fishes in the world. Fish parasites cause commercial losses in both the aquaculture and fisheries industries and may have human health, as well as socioeconomic implications both in

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Year 2023

Date 20

Name of the teacher: Mrs. Chayanika Roy
Title of paper: Red Ghost Crab *Ocypode Macrocerata* (H. Milne Edwards, 1852) Population Dynamics Changes at Bay of Bengal Coast Line in Response to Construction of Digha Marine Drive and Tajpur Port: EIA Study by Rammohan College



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Red Ghost Crab *Ocypode Macrocerata* (H. Milne Edwards, 1852) Population Dynamics Changes at Bay of Bengal Coast Line in Response to Construction of Digha Marine Drive and Tajpur Port: EIA Study by Rammohan College

Kaustav Dutta Chowdhury¹, Chayanika Roy², Debanjana Ghosh³, Fuleswari Chakraborty⁴, Tamanan Kundu⁵, Sanchita Saha⁶, Aishwarya Das⁷, Anjana Sinha⁸, Suchismita Medda⁹, Santi Ranjan Dey¹⁰
^{1,2,10} Assistant Professor, Department of Zoology, Rammohan College, Kolkata
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⁹ Assistant Teacher, M.R.K.C. Balika Vidyalaya, Andul-Mouri, Howrah

Abstract: On the sand beaches of the Bay of Bengal, from Bichitrapur in Orissa to Mandermani in West Bengal, population dynamics of *Ocypode macrocerata* (H. Milne Edwards, 1852) were investigated. The crabs are found across the coastal areas that face the sea. Bichitrapur, Talsari, Udaipur, New Digha, Mohana, Shankarpur, Tajpur, and Mandermani were the principal study locations. The infra-littoral sand flats zone is where the Red Ghost Crabs live. The development of the particular stretch of beach and the prevalence of crab burrows are related. Crab activity occurs both during the day and at night. One to three openings towards the sea can be found in each crab burrow. EIA (Environmental Impact Assessment) is an essential study required before onset of any project or for any ongoing project. This EIA study was conducted in 2017, prior to the start of "Marine drive & Tajpur port" construction, and in 2020, following completion of "Marine drive & Tajpur port" by Rammohan College. At the construction areas, it was discovered that the Red Ghost Crab population had substantially decreased. Additionally altered is the burrow distribution pattern. An essential ecological stabilizer of Sea beach is the red ghost crab. Additionally, it was discovered that the sea beach began to erode where the crabs were completely gone.

Keywords: EIA, *Ocypode macrocerata*, Ecology, population, Digha, Bay of Bengal

I. INTRODUCTION

Ocypode Weber, 1795; a semi-terrestrial crabs are common inhabitants of tropical and sub-tropical sandy beaches (Dahl, 1953; Hedgepeth, 1957), where they occupy obvious burrows (Vannini, 1976; 1980). *Ocypode macrocerata* (H. Milne Edwards, 1852) lives in the supralittoral zone along the coast of the Bay of Bengal region. Nandi and Dev Roy (1996) and Haque and Choudhury (2014) conducted studies on the burrowing behaviour of *O. macrocerata* from the Sundarbans' coastal zone. In the Digha coastal region, Patral et al. (2017) investigated the distribution of every variety of crab. They discovered that the genus *Ocypode* has three species of crab, with *Ocypode macrocerata* (H. Milne Edwards, 1852) falling under the IUCN's DD (Data deficient) classification. They are known as RED GHOST CRAB because; if anyone approaches towards them they disappear inside their burrow promptly. Each burrow aperture has a diameter that falls into one of the following categories: >30 mm, 31-39 mm, 40-50 mm, 51-59 mm, 60-69 mm, 70-79 mm, or 80-90 mm. Burrow opening diameters are often greater than 30 mm and seaward-facing. Before emerging, the burrow dropped in an awkward manner. Burrows were either helical or J-shaped. Always, at least 1 cm of the burrow's deepest point was above the water line (Haque and Choudhury, 2014). Crab activity surveys revealed through behavioural observations that they were active both during the day and at night. Regular burrow excavation was noted twice a day after the tide receded. Sand was regularly taken from a burrow, and much of it was then scattered to an area about 1 m away. Crabs were often solitary feeders. Scavenging, predation, and deposit were the three main feeding behaviours (Haque and Choudhury, 2014).

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Year 2023

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Name of the teacher: Mrs. Chayanika Roy

Title of paper: Assessment of Socioeconomic Impact of Sericulture in Murshidabad: A Social Outreach Programme of Rammohan College

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Assessment of Socioeconomic Impact of Sericulture in Murshidabad: A Social Outreach Programme of Rammohan College

Chayanika Roy¹, Sanjay Kumar Paul², Brinta Basu³, Sriparna Bawali⁴, Mohana Mukherjee⁵, Siddhee Sthita Mishra⁶, Kaustav Dutta Chowdhury⁷, Santi Ranjan Dey⁸

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Abstract: Sericulture was traditionally the main source of income for rural residents in Murshidabad, West Bengal. Sericulture greatly boosts the state's economy by generating jobs, especially for rural women. In 2015–16, the state produced 2568 metric tonnes of raw silk, generating jobs for 22, 19 lakh people. In West Bengal's various districts, there are many problems that affect sericulture workers, such as fluctuating cocoon prices, a lack of markets where raw cocoons can be sold, poor market connections, a lack of storage facilities, poor information about market prices, middlemen who take advantage of sericulture workers, a lack of funding, a lack of innovation, etc. The Researchers were motivated to do this particular investigation by these related issues. As a result, the current investigation will focus on issues at the highest level to lowest level. We found tremendous poverty and gender discrimination, INDLA is earning a lot from Sericulture. This study examines the socioeconomic disparities within the sericulture industry, focusing on the living conditions and prosperity of farmers, weavers, and industrial employees. Through comprehensive research and data analysis, we found that farmers, as landowners, enjoy greater prosperity compared to weavers and industrial employees. The key factor contributing to this disparity is the limited government involvement and support in the growth of the sericulture business, particularly in relation to weavers and industrial employees. Our findings reveal that weavers and industrial employees face extreme poverty, with minimal access to government assistance. Moreover, our investigation uncovered that multiple reeters share a single reeling machine, highlighting the collective efforts of individuals in overcoming resource constraints. The study underscores the urgent need for government intervention to uplift the conditions of weavers and industrial employees, as well as to promote equitable growth in the sericulture industry.

Keywords: Sericulture, Murshidabad, Gender, Socio - economy, Survey

1. Introduction

The Chinese word "Su" [Si], which implies silk, has been translated to the English word "Sericulture." "Seri means "silk" in Sericulture, while culture refers to raising animals [1]. Raising silkworms for the production of raw silk and other byproducts is known as sericulture. In other terms, sericulture is the mass - scale raising of sericigenous insects for the purpose of producing raw silk. Being a unique fibre and known as the "Queen of Textile," silk. Sericulture is a rural, labor - intensive, agro - based cottage industry that offers plenty of jobs to the economically underprivileged groups in society [2]. Sericulture is attracting farmers' attention since it needs little capital outlay and yields great returns quickly. It is the ideal method for enhancing both the rural economy and farmers' level of living. One of India's key economic sectors, sericulture has a significant impact on reducing poverty. Sericulture is one of the cottage businesses that gives rural residents more employment options [3]. The only cash crop in the agricultural industry that provides immediate returns within 30 days is sericulture. The Indian silk industry is the largest in the world and accounts for over 15% of global production [4]. Sericulture is an industry that values the environment and is friendly to women. It illustrates how communities may utilise natural resources without endangering the ecosystem and how people and nature can coexist peacefully. Therefore, sericulture is the ideal profession for West

Bengal's rural population. Sericulture is hence frequently referred to as the "Poverty Industry." The second - highest number of individuals are employed in sericulture, a cottage industry in agriculture (1 acre supports 13 people). Despite the small investment, the profit margin is high. Silk has the ability to produce enough foreign cash. The Morus tree helps halt soil erosion and can be grown on shared land. [4]. Sericulture is a profession that welcomes women and Additionally, fishing, poultry, and the development of medicines can all benefit from using silk worm byproducts [5]. The plant is grown in agricultural fields, and West Bengal is where high yielding versions of the S1, S1635, and BC229 silkworms are raised.

The silk moth can go through one life cycle (univoltine), two life cycles (bivoltine), or four to five life cycles (multivoltine) in a calendar year. The Nistari eggs, which are a hybrid between two distinct cycles, are employed during raising. Typically, multivoltine into multivoltine, multivoltine into bivoltine, or bivoltine into bivoltine are crossed to create Nistari. Typically, multivoltine breeds like A23, B, G, etc. as well as KPGB, NB18, P5, etc. are employed. There are bivoltine breeds utilised. A thread called silk has a sericin - coated protein covering its fibroin core in the middle. The silk gland secretes silk. The fourth and fifth instar larva have a fully formed silk gland. Adults have a lifespan of 4 - 6 days. In women, it is larger than in men. It has a yellowish brown hue. Scales cover the body.

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Happiness Vs Stress, A Case Study of Grievance Analysis from Feed Back: An Evaluation Model Invented By Rammohan College

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ABSTRACT

A highly useful life standard is happiness. A person can only be happy when they are leading a stress-free existence. College students may experience stress related to a variety of academic and external factors and thus they may have grievance(s) against college. Academic, social, environmental, psychological, and physical adjustment are all hampered by uncontrollable stress. The level of happiness and grievance among Rammohan College students was thoroughly investigated in this study. A total of 1002 Rammohan College students (2020-2022) from all semester were conveniently chosen at random to complete a series of questionnaires in order to get trustworthy data. Statistical approaches for inference and description were used to analyze the data. According to the study's findings, the majority of students (82.7%) are satisfied with the college. 17.3% of students are dissatisfied, compared to 13.7% of students who are really stressed and have grievance against college. The majority (91.1%) of students at Rammohan College are from the lower middle class economically. It has been tried to determine whether their financial situation is the primary source of their dissatisfaction and grievance or if there are other factors at play. We discovered a direct link between "not getting any scholarship" and "unhappy and economically backward" pupils.

Keywords: Happiness, Stress, Rammohan College, Scholarship, Gymnasium, Grievance

INTRODUCTION

The ultimate purpose of life is to be happy. A college should foster a happy environment to all stakeholders. Academic excellence is displayed by the happy students more than by the sad students. Stress is a common factor among unhappy people. Every person, regardless of ethnicity or cultural background, experiences stress on a regular basis [1]. The persistent result of several stable and taxing daily duties in every area of our lives is stress. College students' academic lives are challenged by the transition from adolescent to maturity. College students go through rapid physical, social and mental changes at this period and they may also feel unsuitable and adaptable, in the college environment. Due to academic pressure, adjusting to a new environment, failure fear, the struggle to be distinct, inferiority, gaining social familiarity and financial constraints, college students continually experience more complex inconveniences. [2].

One of an adolescent's most exciting and memorable experiences is college life. A vibrant environment, the company of friends, and a variety of academic and extracurricular activities are all enjoyed by teenagers in colleges, enriching and nurturing their academic lives and ultimately preparing the adolescent for adulthood [2].

College students are susceptible to a variety of stress-inducing scenarios, which causes them to constantly come up with new ways to cope with stress. Both the subject matter and the surroundings can be sources of stress for college students. The failure of the students to overcome these factors, which are connected to academic, socioeconomic, and personal triumphs, causes stress [2]. They also need to prepare and concentrate in order to do well in academic assignments across

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Unfolding Protein Structure of RTBV: Encoded by DS DNA Embedded in Rice Genome, A Bioinformatics Approach Related with Rice Tungro Disease

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ABSTRACT

The combined infection of the unrelated rice tungro bacilliform virus (RTBV) and rice tungro spherical virus (RTSV) results in rice tungro, a composite disease. In vulnerable rice growers, RTSV manifests as severe stunting, whereas RTBV is virulent and causes first the yellowing of the leaves, then the death of the plant. The Green Leafhopper (GLH), *Nephotettix virescens* (Distant) is the vector that carries both viruses. If the plant is not infected with RTSV, RTBV cannot be spread. *Oryza sativa* L., the rice plant, contains a piece of the RTBV genome contained within its genome. The hypothetical protein structure of that particular DNA of RTBV has been described in this paper.

Keywords: Rice, Tungro, RTBV, DNA, Protein

INTRODUCTION

The TUNGRO disease has also been referred to as "Penyakit merah" in Malaysia, "Yellow-orange Leaf" in Thailand, "mentek" or "habang" in Indonesia, and "aceocephala" in the Philippines. In the Filipino language, "Tungro" implies deformed growth. A number of nations that produce rice, including Bangladesh, China, India, Malaysia, the Philippines, Thailand, and China, have reported outbreaks (Banerjee et al., 2009). Between 1968 and 1994, this deadly virus infected roughly 1,99,000 acres of rice crops in Indonesia (Varma et al., 1999).

Rice Tungro Bacilliform Virus (RTBV) and Rice Tungro Spherical Virus (RTSV) are the two major viruses that cause rice Tungro disease. With particle sizes of 100–300 nm in length and 30–35 nm in breadth, RTBV is a double-stranded (DS) DNA genome virus and a member of the Tungro virus genus of the Caulimo Viridae family.

Contrarily, RTSV is a single-stranded (SS) RNA virus that is polyhedral in shape, roughly 30 nm in diameter, and belongs to the Waikavirus genus of the Sequiviridae family. Different symptoms can be caused by either one or both viruses being present in the plant. While plants infected with both RTSV and RTBV exhibit mottled leaves, severe stunting, and yellow to orange discoloration of the leaves, leading in a large yield drop (more than 85%), RTSV alone only manifests symptoms like mild stunting and light yellowing of the leaves.

When RTBV is transmitted, RTSV functions as a helper virus. The Green Leafhopper *Nephotettix virescens* (Distant) is the only vector for the spread of these viruses (Dey, 2016a, 2016b, 2019).

On the other hand, RTBV is a plant retrovirus with an 8 kb circular ds DNA genome. A promoter controls the RTBV DNA genome's transcription, situated between ORF IV and ORF I in the intergenic region.

Vascular tissues are where RTBV accumulates, and these tissues also get the majority of the promoter's activity (Tangkamanon, 2005). Two basic Leucine Zipper (bzip)-type rich proteins, RF2a and RF2b, were shown to interact with Box II and activate transcription from the RTBV promoter in vitro and in vivo. These proteins were one of several

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A Geographical Analysis of Alpana and Biodiversity in parts of Rural West Bengal, India

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Article Info	Abstract
Article History Received on: 14 November, 2022 Accepted in Revised Form on: 01 February, 2023 Available Online on and from: 23 March, 2023	<p><i>Alpana is a traditional folk art, a form of symbolic visual folk communication, and a cultural symbol of Bengal. In Bengal, alpana or alpana refers to colourful themes, religious art, or painting done with hands and paint, which is primarily a paste of rice and flour on the floor. In terms of biodiversity and the environment, Alpana of Bengal has given rise to the concept of the connection between forestry culture and agro-based society. This paper examines the trajectory of the practice, the symbolic meaning attached to the art form of Alpana, biodiversity in the art, and tribal perspectives showcasing the environment and agricultural issues of parts of rural West Bengal. The research findings are based on qualitative field observation in some purposely selected rural parts of West Bengal on visual images of the alpana by analyzing as an insider (a Hindu and a Bengali) as well as an outsider (a non-tribal while working among some tribals). The use of multiple data collection techniques (such as graphic elicitation, participant observation, etc.) has helped in triangulating the data collected leading support to the validity claimed in the study of Alpana. This study lends its uniqueness in that little study has been done on the geographical spread of the practice of alpana and its similar art form in India. The author demonstrates the significance of this traditional art in the modern day exploring the blogs and social networking media on views expressed by the present-day generation. It explains the need of sustaining this rich traditional art heritage from vanishing.</i></p>

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Introduction

Alpana is a traditional folk art and cultural symbol of Bengal representing any auspicious occasion. The word *Alpana* is derived from the Sanskrit term '*alimpana*', meaning 'to plaster' or 'to coat with.' However, according to some scholars, *Alpana* is most likely derived from *alipana*, which is the technique of creating embankments of agricultural field (Baskey, 2001) locally referred to as *aals*. In Bengal, *alpana* or *alpana* refers to colourful themes, religious art, or painting done with hands and paint, which is primarily a paste of rice and flour traditionally drawn by housewives before sunset. Traditionally, *alpana* is supposed to be made using a water-based paste of uncooked rice kernel of unprocessed sun-dried paddy called '*aatopchaal*' (a kind of rice) which is diluted to the consistency of thick milk (Dasgupta, 1975). A cotton ball or a small piece of fine cloth is dipped in the liquid mixture and pressed in between the fingers gently so that the liquid flows evenly as one draws the motifs. The traditional Bengali *alpana*

is white and fashioned by women into various geometrical or freehand motifs of flowers, trees, animals, humans, etc. Many sources believe that some of the *vrata* (rituals) and *pujas* (worship) related to *alpana* date back to pre-Aryan times. It's possible that it came down to us from the Austric people who lived in the area long before the Aryans arrived. These scholars claim that Bengal's rituals and traditional folk arts (including *alpana*) originated with the early agricultural communities (Mookerjee, 1939). Rice powder, rice paste diluted with water, dry colour powders made from dried leaves, charcoal, burnt earth, and other materials are commonly used in such works. As was the case with the Ajanta cave paintings, *alpana* is usually done on the floor and not on the wall or ceiling. Bengali women have applied these designs for religious and ceremonial purposes from time immemorial (Saksena, 1985) in the Hindu sacred space. The art form, *Alpana* was originally performed in villages by the girls to decorate the door-fronts, floors, and the places before the idols of

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Rural Bengal Wall Motifs: a visual analysis of the Santhal Women's Art in Purulia

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Abstract:

Wall arts or motifs are the ritual drawings connected with desires and aspirations of human beings predominantly by women. The women paint their walls as a celebration of the harvest and as a thanksgiving to nature. Wall art or motifs on wall is a visual cultural symbolic representation of tribal art. In Bengal, Wall art or motifs refers to colourful themes, religious art, or painting done with hands and paint by the village woman, which is primarily derived from mud. Some of the motifs are based on natural colour on mud walls. Red, black and white is the predominant colours used. The rural women first draw the outlines in white and fill up the figures with various colours. In terms of biodiversity and the environment, the wall-art of Bengal has given rise to the concept of the connection between forestry culture and agro-based society. This paper examines the trajectory of the practice, the symbolic meaning attached to the art form biodiversity in the art, and tribal perspectives showcasing the environment and agricultural issue of parts rural West Bengal. The research findings are based on qualitative field observation on visual images of the art. Use of multiple data collection techniques (such as graphic elicitation, participant observation, etc.) has helped in triangulating the data collected lending support to the validity claimed in the study of wall art.

Key Words: wall motifs, visual analysis, tribal women

Introduction

Wall art or pattern motifs are a traditional folk art and cultural symbol as well as self expression of tribal women. The walls of village are often hand painted and decorated to get blessings of god and goddess at weddings, births and harvest season or on religious festival days (Jailly, 2018). Tribal women are basically involved themselves in this indigenous art form, express their arts thoughts in three ways ritualistic, utilitarian and individualistic (Vidyarthi and Rai, 1976) with hands and locally available handmade colour, which is primarily a red colour paste of *khariya* (zinc oxide) and creamy white colour is Kaolin, and locally called *dudhi mati* (type of clay). Traditionally, the art is supposed to be made using a water-based paste of uncooked rice kernel of unprocessed sun-dried paddy called '*aatopchaal*' (a kind of rice) which is diluted to the consistency of thick milk (Maity, P.K., 1988). The traditional wall-art is various colours and created by women into various geometrical or freehand motifs of flowers, trees, animals, humans, etc.

Wall art or motifs on wall is a traditional, ritualistic drawing, popular in Bengal and continues to be an integral part of all celebrations – be it '*pujas*' or weddings (Pattanaik, 2006). Discovery of farming in Neolithic period changed the imagery style. During the farming or agriculture-based life people began drawing on the home walls and floors. This feature still persists in some parts of rural Bengal as perceived by the author in the tribal dominated areas on the walls, the doorway, on the floor and illustrated through some photo plates captured on the field. Beside that style, theme and subject matter also changed. Now the tribal women prefer realistic images rather than symbolic images. Taste of food has also changed from animal flesh

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to grain. Though food gathering or cultivation was less life threatening, the sense of uncertainty was there. As a result, they needed to worship the absolute power associated with inevitability, uncertainty, and providence, which they were already familiar with in the previous hunting and gathering lifestyle (Banerjee, 1995).

Several scholars claim that Bengal's rituals and traditional folk arts (including *alpana*, drawing on the floor, and wall art) originated with the early agricultural communities (Mookerjee, 1939). Rice powder, rice paste diluted with water, dry colour powders made from dried leaves, charcoal, burnt earth, and other materials are commonly used in such works. The art form was originally performed in villages by the girls and women to decorate the door-fronts, floors, wall and the places before the idols of deities. Initially, the art saw the use of motifs of paddy leaf, feet of Goddess Laxmi, lotus and other images which were meant for welcoming wealth into the house. The separation and homogeneity of the motifs in these designs, give them a subtle character. Due to discovery of farming in the Neolithic period imagery pattern changed from hunting to agricultural society. With a touch of hunting culture and patronage of agricultural societal values, this art has become a lost link from the past (Chakroborty, 2015). Thus, while the design has a mechanical motion and a stereotyped symmetry, the intrinsic energy of the motifs of these designs inevitably pushes itself through the traditional guidelines. By assessing the Bengal ritualistic image, a list of biodiversity may be created, and this list explores the extensiveness of biodiversity. In terms of biodiversity and the environment, Wall art of Bengal has given rise to the concept of the connection between forestry culture and agro-based society, which serves as a missing link in human succession. It is also correct to assume that art has a form of symbolic visual folk communication (Banerjee, 1995).

This study lends its uniqueness in that little study has been done on the geographical spread of the practice of the art and its similar art form in India in general and rural West Bengal in particular. Through literature search the research gap has been identified to be attaching symbolic meaning to the art form of the wall art by the Santhals; the associated biodiversity in the art particularly from a tribal woman's perspective.

Study Area:

Tribal wall art is excellent example of biodiversity, agro symbols related issues. For an in-depth study of the wall art as practiced by the tribes of rural Bengal in the district of Purulia, the forest embraced Baghmundi block of Purulia has been chosen (Fig. 1). It is within the Amdihub hills, a sub range of north eastern part of

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Rural Tourism Through the Community Participation and Sustainable Development: An Empirical Study from Silk Route, East Sikkim

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Abstract: Tourism destinations often are dependent on natural and cultural/heritage resources to form their attractions bases, which are linked to the economic vitality of local communities. Tourism industry can generate income and holistic development of a region. Rural tourism provides an economic incentive to the local people who are residing in these regions. It also adds an ethnic flavor to the consumer's (tourist) taste. Silk Route in Sikkim is popularly known as 'Silk Route' in Sikkim tourism map. It is one of the best rural tourist destinations of Sikkim. The silk route is very popular among the tourists. The landscape is beautiful and wonderfully thrilling. The lush greenery, panoramic view of hills and the simplicity of the indigenous inhabitants attracts the urban tourists to this place. The paper attempts an empirical presentation addressing the concept of rural tourism, which is an emerging perception on tourism introduced recently into the Indian tourism sector. This paper try to explore the potentiality as a rural tourist destination, and how such rural or Ecotourism can be an instrument to empower indigenous communities in a particular area and provide community development through economic and social benefits to the local communities for their well-being. This finding can be exemplified elsewhere as an approach on sustainable development of rural tourism through the community participation and management practiced at village level.

Keywords: Rural tourism, silk route, sustainable development

I. INTRODUCTION

Tourism is the collection of activities, services and industries that delivers a travel experience, including transportation, accommodation, eating and drinking establishments, retail shops, entertainment business and other hospitality services provided for individuals or groups travelling away from home. The World Tourism Organization (WTO) defined sustainable tourism development as "that which meets the needs of present tourist and host regions while protecting and enhancing opportunities for the future". Sustainable tourism or Ecotourism is as an instrument to empower indigenous communities in a particular area (Sofield, 2003). Its goal is to achieve conservation and community development through the provision of economic and social benefits to the local communities for their well-being (Chapman, 2003). This is a contemporary global –national-regional-local issue with the adoption of the Sustainable Development Goals, to which India too is committed. Rural tourism is one of the aspects of ecotourism that endeavors to conserve the natural, cultural, and built environment; preventing rural-urban migration by providing economic, environment and social benefits to local residents and provides a high-quality experience for the guests. Developing approaches that are able to touch upon each of these areas can ensure the long-term success of the community. Community based ecotourism through the home-stay model is one of the top activities promoted in society to reduce the incidence of rural poverty (Leksakundilok, 2004). In India, there are tremendous tourism opportunities with both cultural and natural resources and it offers vast sprawling natural beauty, seasonal diversities, cultural richness, ethnicity, and hospitality of local communities. "India truly lives in Village" – rural environment has many cultures having different fairs and festivals to show-off. In rural tourism, visitors get a chance to spend time with the rural family by observing their customs, values and culture, which gives them the taste of rural life (Devkota, 2010). Present study explore the Silk-Route of eastern Sikkim as rural tourism destination, which is a part of ancient trade route that begun in Lhasa, through Chumbi Valley, preceded via Nathula Pass, and ultimately took the port at Tamralipta (present Tamluk in West Bengal). This route is now open is popularly known as 'Silk Route' in Sikkim tourism map. This rural tourism sector is the harmony of nature with its unexplored untapped forest, biodiversity and the serene Kanchenjunga with in the lap of the mighty Himalayas. The lush greenery, panoramic view of hills and the simplicity of the indigenous inhabitants attracts the urban tourists to this place.

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ORIGINAL ARTICLE

Efficacy of green synthesis of Silver nanoparticles from Tulsi (*Ocimum sanctum*) leaf aqueous extract and its antibacterial effect on clinical multidrug-resistant *Staphylococcus aureus* in West Bengal

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Abstract

Rapid augmentation in the prevalence of multidrug-resistant (MDR) *Staphylococcus aureus* is a worldwide threat. Advising newer antibiotics may fail to reduce the chances of the emergence of newer drug-resistant *Staphylococcus aureus*. Very little shreds of evidence can be found to treat clinical MDR *Staphylococcus aureus* with biogenic silver nanoparticles (AgNPs) in West Bengal. To prepare AgNPs biogenically using aqueous tulsi leaf extract (TLE) and also to assess its antibacterial effect upon clinical MDR *Staphylococcus aureus*, biogenic synthesis of the AgNPs using aqueous TLE was done, characterized those with UV-Vis Spectrophotometer, dynamic light scattering, field emission scanning electron microscopy, Fourier transform infrared spectroscopy, and evaluated the antibacterial activity against the clinical MDR *Staphylococcus aureus*. ANOVA followed by LSD post hoc test was used to test the differences between the OD (optical density) of different experimental sets. The biosynthesized AgNPs were spherical, monodispersed, and of smaller size (9-23 nm) with the involvement of eugenol, quercetin, and oleanolic acid present in the tulsi leaf. A significant change in OD was observed in AgNPs (prepared using TLE) treated broth compared to only tulsi leaf extract treated culture. There was a significant similarity between the efficacies of AgNPs and clindamycin ($P < 0.05$). Our findings propose that AgNPs synthesized using TLE were fast and efficient to ameliorate the bacterial growth, which may be used as a potent antibacterial agent for the treatment of clinical MDR *Staphylococcus aureus* infection in near future.

Keywords: Ag Nanoparticles; Biogenic; Clindamycin; MDR; MRSA; *Staphylococcus aureus*; Tulsi.

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INTRODUCTION

From the origin of the concept of nanoparticles in 1954 by eminent scientist Paul Ehrlich [1] to the 21st century, there is an immense change in the craze of using nanoparticles in research work has been observed. Biologically prepared nanoparticles have the potential to lead us to find solutions to a wide range of issues that are being

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encountered nowadays. Chemically reduced silver nanoparticles have an adverse effect on human health as well as it gives low yield and requires high energy [2]. As an alternative, biogenic silver nanoparticles emerged as a good antibacterial, as well as an antifungal, and anticancer agent. Apart from this, the literature suggests the use of AgNPs (Silver nanoparticles) in different sectors like clothing [3], water treatment/purification

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Original Research Article

A study of growth pattern of school going children of Kolkata, India

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ABSTRACT

Background: In our society only, a few peoples have good physiological status from their childhood. Health status of children and adolescents is important factor for young society. This present study highlights the peoples' state of health and nutrition. Change in height with respect to age can be seen during puberty and adolescence. Growth can also be dependent upon the geographical regions.

Methods: In this study included 230 adolescent students (boys- 146, girls- 84) in the age group of between 12-18 years. So many related growth parameters were measured using by an anthropometric rod, weighing machine, and slide calliper. BMI, p value was obtained by performing t-test at 0.05 level of significance. Statistical software SPSS version 20 was used.

Results: Growth parameter was found to be increasing with age and it was more pronounced between 16 and 17 years. Interestingly the increment of all the growth parameter was found to be more in urban and less in rural.

Conclusions: The findings of this study showed a progressively increasing of growth-related parameters with ages and the progress vary, indicating a nutritional supplementation are unequal (unequal growth pattern), as it was evident from different growth parameters percentile values of CDC and IAP values. This study will certainly help to create among the children and their parents about the physical growth and health.

Keywords: Adolescent, Anthropometry, BMI, Growth parameters, Puberty, School students

INTRODUCTION

In our society only a few peoples have good physiological status from their childhood. Health status of children and adolescents is important factor contributing to the nation's health. For better performance and life, physiological fitness is way more important.¹ Poor socio-economic status makes both malnutrition and obesity like diseases.² Malnutrition causes such a big number of differing kinds of morbidities like growth faltering, developmental retardation, and significant mortality.³ Physical growth is a dynamic, complicated, and long process that continues throughout all of infancy, childhood, and adolescence.⁴ Anthropometry is the branch of human sciences which is related with some

parameters like measurement of size, shape, strength and dealing capacity. Physical dimension of the body is way influenced by nutrition particularly within the rapidly growing period of student community.⁵ Despite the well-known importance of nutritional health several cultural, social, political, economic, and academic factors contribute to malnutrition among children.⁶ School going children constitute one-fifth of the overall population and are the long run of the state.⁷ The health supervision of the school children is critical and might help to spot the magnitude of morbidity and malnourishment in a very community.⁸ In Asia, prevalence of undernutrition in the form of protein undernourished children in the world, contributing significantly to the high morbidity and mortality in the country.⁹ Evidence from all over India

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Postural strain of spinner and casting workers of a small-scale aluminium utensil making factory

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ABSTRACT

Background: Small scale establishments often neglect the worker safety and comfort which impacts both productivity and workers' safety. Various studies have been conducted in such small-scale establishments but not much has been done on aluminium utensil manufacturing factories. Spinning and casting are two important processes for manufacturing of aluminium utensils. But not much has been studied to assess the hazards of the involved workers. The present study is an attempt to explore this previously unnoticed area.

Methods: The study was conducted in different small scale aluminium utensil factories in West Bengal. Sixteen spinners and seventeen casting workers were evaluated for this study. The analysis of posture was done by rapid upper limb assessment (RULA), rapid entire body assessment (REBA) and Ovako working posture analysis system (OWAS). The body parts discomfort was assessed by using Cornell musculoskeletal discomfort questionnaire and Nordic questionnaire was also used to assess the pain they experience.

Results: All the casting workers are experiencing postural load beyond the recommended limit whereas in case of spinner, five workers experienced less postural load due to favorable work conditions. Casting workers mainly suffered from low back, neck, right shoulder pain whereas spinners suffered from wrist and finger pain followed by lower extremity pain.

Conclusions: Both group of workers are experiencing postural load and discomfort. In case of casting workers, the prevalence was high and immediate interventions are needed. The discomfort is particularly high during the end of shifts.

Keywords: Nordic questionnaire, Postural load, Body part discomfort, Cornell musculoskeletal discomfort questionnaire, Musculoskeletal pain

INTRODUCTION

The concept of ergonomics in workplace design is ignored in most of the industries. This problem is very much prevalent around the world, including India. The problem of workplace design should be thought of at the blueprint stage involving an ergonomist along with process engineers, and production engineers. The workplace design is basically governed by the two main dimensions,

i.e., clearance and reach, where clearance will be focused on taller individuals and reach for shorter. Lacing of which force the workmen to assume awkward posture, poor posture, and bad posture. Assuming those posture by the workmen are either due to inadequate workspace or due to lack of awareness of the workmen. In most of the unorganized sectors in India, the workers are forced to work in low wage where their work effort is maximum but occupational safety is highly neglected.¹

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REVIEW ARTICLE

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A Guide Towards the Phenotypic Detection of Extended-spectrum β -lactamases Production in *Enterobacteriaceae*: Alone or in Presence of Other Interfering Enzyme

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Abstract

Antimicrobial Resistance (AMR) has been regarded as a major public health concern as a reason of millions of deaths. Extended-spectrum β -lactamase (ESBL) is considered as a leading factor contributing to this and limiting its treatment. Thus, ESBL producing *Enterobacteriaceae* should be discriminated from those having other mechanism conferring resistance. Several phenotypic methods have been evaluated for this purpose. Some of these are based on conventional method (DDST, CDT, ESBL E-test, Cica- β test) while others depend on automated systems (VITEK 1, VITEK 2, Phoenix, MicroScan). All the conventional methods have been found to be more specific, sensitive and cost effective than any of the automated system though they are easy to perform and interpret. Automated system also fails to detect ESBL in presence of other interfering enzymes such as AmpC, MBL or K1 enzyme. ESBL can be detected by using third-generation cephalosporin (cefotaxime or ceftazidime) or monobactam (aztreonam) in combination with clavulanate. AmpC can be distinguished by using cloxacillin-containing agar, fourth-generation cephalosporin (cefepime) or phenyl boronic acid. MBL producers remain unaffected in presence of clavulanate but gets inhibited by carbapenems (imipenem, meropenem) in combination with EDTA. Cefpodoxime-clavulanate and ceftazidime-clavulanate combinations are reliable for K1 enzyme detection but are not suitable for distinguishing bla_{CTX-M2}.

Keywords: β -Lactamase, *Enterobacteriaceae*, Extended-spectrum β -lactamases, AmpC, Metallo- β lactamase, K1 Enzyme, Phenotypic Detection, Review

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Vitamin C and E supplementation and high intensity interval training induced changes in lipid profile and haematological variables of young males

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ARTICLE INFO

Keywords:
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ABSTRACT

High intensity interval training (HIIT) causes oxidative stress and haematological alteration. Present study was aimed to evaluate the effect of 8 weeks' supplementation of vitamin C and E on HIIT induced changes in lipid profile parameters and haematological variables. Hundred six male adolescent players were randomly assigned into five age-matched groups, i.e., Control (no exercise + placebo), HIIT (placebo), HIIT + vitamin-C (1 000 mg/day), HIIT + vitamin-E 400 IU/day) and combined HIIT + vitamin C and E. Morning and evening sessions (90 min) of HIIT included 4 phases (15 min each) with 3 sets (4 min each). Each 4 min HIIT set consisted of 2 min intense sprint workout (90%-95% of heart rate maximum [HR_{max}]) followed by 1 min active recovery (60%-70% HR_{max}) followed by 1 min of complete rest (1:1 work-rest ratio). Lipid profile parameters, haematological variables, endurance capacity and vertical jump were evaluated by standard protocols. Significant decrease in body weight, fat%, total cholesterol, triglyceride, Total Cholesterol/High Density Lipoprotein-Cholesterol and significant increase in High Density Lipoprotein-Cholesterol, maximal oxygen consumption, vertical jump were observed for all four intervention groups. White blood cell count, red blood cell count, haemoglobin percentage and haematocrit values were significantly decreased while platelet count and platelet-to-leukocyte ratio (PLR) ratio were increased significantly only for HIIT group. Blood level of tocopherol and ascorbic acid was significantly increased (values were within the normal range) in all the respective vitamin supplemented groups. Supplementation of vitamin C and E secures health protection with suppressed haemolysis and improved inflammatory blood variables with enhanced explosive leg strength and lipid profile parameters without any concomitant change in endurance capacity.

Introduction

High-intensity interval training (HIIT) is a time-efficient strategy and an efficient alternative to traditional endurance training among athletes to develop both the aerobic and anaerobic systems within a short period.¹ But strenuous exercises like eccentric intervals/high-intensity training inflict metabolic and mechanical stress due to the need for excessive energy in a very short time. This higher need for energy increase oxygen consumption leading to the generation of mitochondrial reactive oxygen species (ROS).^{2,3} Studies depict that high-intensity exercises elicit detrimental effects on skeletal muscle^{2,4} and increase circulatory

proinflammatory cytokines (interleukin-6 [IL-6] and tumour necrosis factor-alpha [TNF- α]) in proportion to ROS generation.^{5,6}

High-intensity/eccentric exhaustive training induces oxidative stress and alters the haematological profile by facilitating haemolysis along with a decrease in ferritin, haemoglobin (Hb) content, and haematocrit value (HCT). However, the erythrocyte-related changes occur simultaneously with decreased leukocyte count, increased platelet count, and platelet-to-leukocyte ratio (PLR) due to the effect of HIIT.⁷ Examination of the literature revealed that antioxidant vitamins (e.g., vitamin A, vitamin C and vitamin E) are effective in preventing exercise-induced inflammation-like responses and adverse haemorrhagic changes.^{8,9}

Vitamin C and vitamin E are the most prevalent vitamin supplements

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Research Paper / Article / Review

Hepatoprotective Role of Hydro-Ethanollic Extract of *Alocasia indica* Tubers against Ethanol Induced Oxidative Stress

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Abstract: *Alocasia indica* is widely used in Indian folklore medicine and has its mention in Ayurveda. Especially in Ayurveda, it is used to treat tumors, inflammations, hemorrhages, hepato-splenopathies, amenorrhea, dysmenorrhea, fatigue and general debility. The current study investigates the hepatoprotective effect of *Alocasia indica* against chronic ethanol induced oxidative stress and tissue damage. The rats were segregated into seven groups which included normal control, ethanol treated (40%w/v) 2gm/kg body weight /day, ethanol+silymarin (100mg/kg), ethanol+AI (250mg/kg), ethanol+AI (500mg/kg), only AI (250mg/kg) and only AI (500mg/kg) for 30 days to evaluate the hepatoprotective effect against ethanol toxicity. Hepatic antioxidant enzymes, liver markers and pro-inflammatory cytokines were assayed biochemically. Histomorphological alterations were

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Title of paper: Protective role of Decylubiquinone against secondary melanoma at lung in B16F10 induced mice by reducing E-cadherin expression and ameliorating ROCKII-Limk1/2-Cofilin mediated metastasis

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Protective role of Decylubiquinone against secondary melanoma at lung in B16F10 induced mice by reducing E-cadherin expression and ameliorating ROCKII-Limk1/2-Cofilin mediated metastasis

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ABSTRACT

Melanoma is one of the most consequential skin cancer with a rising death incidences. Silent but belligerent nature of metastatic sprouting is the leading cause of melanoma related mortality. Invasion of metastatic cells and re-expression of E-Cadherin play the crucial role in the establishment of secondary tumor at distal sites. Thus, manipulation of tumor cell invasion in parallel to regulation of E-Cadherin expression can be considered as potential anti-metastatic strategy. Evidences suggested key role of reactive oxygen species associated ROCK activities in the modulation of metastatic invasion via F-actin stabilization. Here, we first-time report Decylubiquinone, a dietary Coenzyme Q₁₀ analog, as an effective attenuator of pulmonary metastatic melanoma in C57BL/6 mice. Current study depicted detailed molecular interplay associated with Decylubiquinone mediated phosphorylation of ROCKII at Tyr722 along with reduced phosphorylation of ROCKII Ser1366 leading to suppression of Limk1/2-Cofilin-F-actin stabilization axis that finally restricted B16F10 melanoma cell invasion at metastatic site. Analysis further deciphered the role of HNF4 α as its nuclear translocation modulated E-Cadherin expression, the effect of reactive oxygen species dependent ROCKII activity in secondarily colonized B16F10 melanoma cells at lungs. Thus unbosoming of related signal orchestra represented Decylubiquinone as a potential remedial agent against secondary lung melanoma.

1. Introduction

Melanoma is reported as one of the virulent dermatological cancer [1]. According to GLOBCAN 2020, this fatal disease was responsible for >57,043 deaths and in most cases metastatic spreading is responsible for the same [2]. Now a days, only 15% patients with distant metastasis were survived after five years of diagnosis [1]. Thus, inhibition of metastasis is the main key for improving melanoma related survivability.

Metastasis is a multi-step process involving epithelial to mesenchymal transition (EMT), loss of cell adhesion and dissolving ECM via metalloprotease activity leading to extravasation [3]. Following extravasation from a primary tumor, migrating cancer cells invade into local as well as distant organ, carry out mesenchymal-epithelial transition (MET) and finally proliferate to generate new metastatic tumors [4]. Studies on breast cancer pulmonary metastasis also suggested

Abbreviations: Dub, Decylubiquinone; DMEM, Dulbecco's Modified Eagle's Media; DMSO, Dimethyl sulphoxide; HNF, Hepatocyte nuclear factor; EDTA, Ethylenediaminetetraacetic acid; ID-1, Inhibitor of DNA binding 1; FBS, Foetal bovine serum; IL, Interleukin; ROCK, Rho-associated coiled-coil containing protein kinase; MMP, Matrix metalloproteinase; PBS, Phosphate buffered saline; TGF β , Tumor growth factor β ; VEGF, Vascular endothelial growth factor; Smad, Sma-and Mad-related protein; LIMK, LIMK domain kinase 1; ECM, Extracellular matrix; MT, Metastatic tumor bearing mice; BAL, Bronchoalveolar lavage; NAC, N-Acetyl Cysteine.

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RELATION BETWEEN AIR QUALITY INDEX (AQI) AND BUTTERFLY RICHNESS: A STUDY FROM ENVIRONMENTAL AUDIT OF RAMMOHAN COLLEGE

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Abstract: Butterflies are a crucial component of the environment due to their role in pollination. They are also regarded as reliable ecological indicators because to their sensitivity to climatic and environmental changes. The characteristics that make these species so-called "bio-indicators of the area" include their great sensitivity to environmental changes, the relative ease with which they may be seen, and knowledge of their natural history. An important indicator of air pollution is the Air Quality Index (AQI). Considering that Rammohan College is located in the centre of Kolkata, AQI may have an impact on butterfly mortality, reducing the number of species (species richness) or individuals within a species (species abundance). After 5 year survey, we found that, 21 species of butterfly are present in the Rammohan College campus but there is no significant correlation between butterfly species richness and AQI (PM_{2.5}, 10, O₃).

Key words: AQI, Butterfly, Rammohan College, Environment, Audit

1. INTRODUCTION

Butterflies are a crucial component of the environment, for their pollination activities (Daily, 1997; Scobel, 1998). They are also regarded as effective ecological indicators because to their sensitivity to climatic and environmental changes (Lawtan, 1998; Venkataramana, 2010). The characteristics that make these species so-called "bio-indicators of the area" include their great sensitivity to environmental changes, the relative ease with which they may be seen, and knowledge of their natural history. Approximately, 18,768 species of butterflies have been recorded worldwide and recent findings suggest that India hosts 1318 species in its subcontinent, out of which 89 species belong to Papilionidae, 277 species belong to Hesperidae, 92 species belong to Pieridae, 19 species belong to Riodinidae, 380 species belong to Lycaenidae, and 461 species belong to Nymphalidae (Samal *et al.*, 2021).

According to Blair and Launer (1997) and Stefanescu *et al.* (2004) the richness, diversity, and abundance of butterfly species decline as urban elements such as roads, buildings, and lawns increase. Natural biodiversity suffers as a result of the quantity and quality of natural habitat being reduced due to urban development (Clark *et al.*, 2007). The replacement or reduction of natural and semi-natural habitats by buildings and other concrete constructions is likely to have a negative effect on butterfly populations. Additionally, it is anticipated that different types of pollution will have a negative impact on the quality of residual habitats (Pocewicz *et al.*, 2009). Apart from the habitat loss, the widespread use of insecticides has drastically reduced the numbers of butterflies. The clouds of butterflies that used to fly past as one walked through wild places can no longer be taken for granted.

Nowadays, it is more widely acknowledged that biological variety is a crucial factor in determining the sustainability of development efforts as well as local and global environmental changes. However, few metropolitan areas in West Bengal have seen a thorough study of invertebrates, notably butterflies. It is useful as a tool for making decisions related to butterfly management and conservation. Therefore, it is crucial to create a zone-by-zone database or checklist of the diversity of butterflies in our nation, particularly in our state of West Bengal (Malagrino *et al.*, 2008; Pollard and Yates, 1993; Chowdhury and Das, 2007).

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COMPARISON OF ENVIRONMENTAL STRESS IN RELATION TO INFRASTRUCTURE OF OLD AND NEW BUILDING OF RAMMOHAN COLLEGE, KOLKATA, WEST BENGAL

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ABSTRACT

The phrase "environmental stress" is used to characterise the physical, chemical, and biological constraints on the diversification of organisms and ecosystems. Environmental stressors are the tiny annoyances and frustrations of everyday living. One important aspect of education is the support system. In the tropical nation of India, the state of West Bengal, the summers are hot and muggy for almost half the year. The problem is getting worse as a result of global warming. A stressful environment can be produced by infrastructure elements such as wall textures, ceiling heights, window positioning, air flow, lighting, and fan designs, among others. College teachers may experience professional burnout as a result of the environment's stress. There has been research done on the environments of the classrooms at Rammohan College in two separate buildings. According to the reference range, it has been discovered that the indoor classroom environment of the New Building is consistently within the "Partial Discomfort" range (lowest and highest TH1 values 75.86 & 79.20). According to the reference range, the indoor classroom atmosphere of the old building runs from "Comfortable to Partial Discomfort" (74.15 & 77.56).

Key Words: Rammohan College, TH1, WBGT, Class room, Infrastructure, Stress

INTRODUCTION

Due to severe occupational and environmental restrictions, it is possible that a teacher may experience stress. Environmental stress is the term used to describe the physical, chemical, and biological limitations on species production and ecosystem expansion. The minor irritations and frustrations of everyday life are what are known as environmental stressors (Miller and Bates, 2007). Physiological reactions may occur when environmental stressors worsen. Stressors can be a result of human action or they might exist naturally in the environment. While certain environmental stressors primarily have an impact on the local community, others may potentially have repercussions farther afield or even globally (Eres and Atanasoska, 2011).

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Name of the teacher: Dr. Kaustav Dutta Chowdhury
Title of paper: Red Ghost Crab *Ocypode Macrocerata* (H. Milne Edwards, 1852) Population Dynamics Changes at Bay of Bengal Coast Line in Response to Construction of Digha Marine Drive and Tajpur Port: EIA Study by Rammohan College



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Red Ghost Crab *Ocypode Macrocerata* (H. Milne Edwards, 1852) Population Dynamics Changes at Bay of Bengal Coast Line in Response to Construction of Digha Marine Drive and Tajpur Port: EIA Study by Rammohan College

Kaustav Dutta Chowdhury¹, Chayanika Roy², Debanjana Ghosh³, Fuleswari Chakraborty⁴, Tamanita Kundu⁵, Sanchita Saha⁶, Aishwarya Das⁷, Anjana Sinha⁸, Suchismita Medda⁹, Santi Ranjan Dey¹⁰
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Abstract: On the sand beaches of the Bay of Bengal, from Bichitrapur in Orissa to Mandermani in West Bengal, population dynamics of *Ocypode macrocerata* (H. Milne Edwards, 1852) were investigated. The crabs are found across the coastal areas that face the sea. Bichitrapur, Talsari, Udaipur, New Digha, Mohana, Shankarpur, Tajpur, and Mandermoni were the principal study locations. The infra-littoral sand flats zone is where the Red Ghost Crabs live. The development of the particular stretch of beach and the prevalence of crab burrows are related. Crab activity occurs both during the day and at night. One to three openings towards the sea can be found in each crab burrow. EIA (Environmental Impact Assessment) is an essential study required before onset of any project or for any ongoing project. This EIA study was conducted in 2017, prior to the start of "Marine drive & Tajpur port" construction, and in 2020, following completion of "Marine drive & Tajpur port" by Rammohan College. At the construction areas, it was discovered that the Red Ghost Crab population had substantially decreased. Additionally altered is the burrow distribution pattern. An essential ecological stabilizer of Sea beach is the red ghost crab. Additionally, it was discovered that the sea beach began to erode where the crabs were completely gone.

Keywords: EIA, *Ocypode macrocerata*, Ecology, population, Digha, Bay of Bengal

I. INTRODUCTION

Ocypode Weber, 1795; a semi-terrestrial crabs are common inhabitants of tropical and sub-tropical sandy beaches (Dahl, 1953; Hedgepeth, 1957), where they occupy obvious burrows (Vannini, 1976; 1980). *Ocypode macrocerata* (H. Milne Edwards, 1852) lives in the supralittoral zone along the coast of the Bay of Bengal region. Nandi and Dev Roy (1996) and Haque and Choudhury (2014) conducted studies on the burrowing behaviour of *O. macrocerata* from the Sunderbans' coastal zone. In the Digha coastal region, Patral et al. (2017) investigated the distribution of every variety of crab. They discovered that the genus *Ocypode* has three species of crab, with *Ocypode macrocerata* (H. Milne Edwards, 1852) falling under the IUCN's DD (Data deficient) classification. They are known as RED GHOST CRAB because; if anyone approaches towards them they disappear inside their burrow promptly.

Each burrow aperture has a diameter that falls into one of the following categories: >30 mm, 31-39 mm, 40-50 mm, 51-59 mm, 60-69 mm, 70-79 mm, or 80-90 mm. Burrow opening diameters are often greater than 30 mm and seaward-facing. Before emerging, the burrow dropped in an awkward manner. Burrows were either helical or J-shaped. Always, at least 1 cm of the burrow's deepest point was above the water line (Haque and Choudhury, 2014).

Crab activity surveys revealed through behavioural observations that they were active both during the day and at night. Regular burrow excavation was noted twice a day after the tide receded. Sand was regularly taken from a burrow, and much of it was then scattered to an area about 1 m away. Crabs were often solitary feeders. Scavenging, predation, and deposit were the three main feeding behaviours (Haque and Choudhury, 2014).

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Title of paper: Assessment of Socioeconomic Impact of Sericulture in Murshidabad: A Social Outreach Programme of Rammohan College

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Assessment of Socioeconomic Impact of Sericulture in Murshidabad: A Social Outreach Programme of Rammohan College

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Abstract: Sericulture was traditionally the main source of income for rural residents in Murshidabad, West Bengal. Sericulture greatly boosts the state's economy by generating jobs, especially for rural women. In 2015-16, the state produced 2568 metric tonnes of raw silk, generating jobs for 22, 19 lakh people. In West Bengal's various districts, there are many problems that affect sericulture workers, such as fluctuating cocoon prices, a lack of markets where raw cocoons can be sold, poor market connections, a lack of storage facilities, poor information about market prices, middlemen who take advantage of sericulture workers, a lack of funding, a lack of innovation, etc. The Researchers were motivated to do this particular investigation by these related issues. As a result, the current investigation will focus on issues at the highest level to lowest level. We found tremendous poverty and gender discrimination, INDLA is earning a lot from Sericulture. This study examines the socioeconomic disparities within the sericulture industry, focusing on the living conditions and prosperity of farmers, weavers, and industrial employees. Through comprehensive research and data analysis, we found that farmers, as landowners, enjoy greater prosperity compared to weavers and industrial employees. The key factor contributing to this disparity is the limited government involvement and support in the growth of the sericulture business, particularly in relation to weavers and industrial employees. Our findings reveal that weavers and industrial employees face extreme poverty, with minimal access to government assistance. Moreover, our investigation uncovered that multiple reelers share a single reeling machine, highlighting the collective efforts of individuals in overcoming resource constraints. The study underscores the urgent need for government intervention to uplift the conditions of weavers and industrial employees, as well as to promote equitable growth in the sericulture industry.

Keywords: Sericulture, Murshidabad, Gender, Socio - economy, Survey

1. Introduction

The Chinese word "Su" [Si], which implies silk, has been translated to the English word "Sericulture." "Seri" means "silk" in Sericulture, while culture refers to raising animals [1]. Raising silkworms for the production of raw silk and other byproducts is known as sericulture. In other terms, sericulture is the mass - scale raising of sericigenous insects for the purpose of producing raw silk. Being a unique fibre and known as the "Queen of Textile," silk. Sericulture is a rural, labor - intensive, agro - based cottage industry that offers plenty of jobs to the economically underprivileged groups in society [2]. Sericulture is attracting farmers' attention since it needs little capital outlay and yields great returns quickly. It is the ideal method for enhancing both the rural economy and farmers' level of living. One of India's key economic sectors, sericulture has a significant impact on reducing poverty. Sericulture is one of the cottage businesses that gives rural residents more employment options [3]. The only cash crop in the agricultural industry that provides immediate returns within 30 days is sericulture. The Indian silk industry is the largest in the world and accounts for over 15% of global production [4]. Sericulture is an industry that values the environment and is friendly to women. It illustrates how communities may utilise natural resources without endangering the ecosystem and how people and nature can coexist peacefully. Therefore, sericulture is the ideal profession for West

Bengal's rural population. Sericulture is hence frequently referred to as the "Poverty Industry." The second - highest number of individuals are employed in sericulture, a cottage industry in agriculture (1 acre supports 13 people). Despite the small investment, the profit margin is high. Silk has the ability to produce enough foreign cash. The Morus tree helps halt soil erosion and can be grown on shared land. [4]. Sericulture is a profession that welcomes women and Additionally, fishing, poultry, and the development of medicines can all benefit from using silk worm byproducts [5]. The plant is grown in agricultural fields, and West Bengal is where high yielding versions of the S1, S1635, and BC229 silkworms are raised.

The silk moth can go through one life cycle (univoltine), two life cycles (bivoltine), or four to five life cycles (multivoltine) in a calendar year. The Nistari eggs, which are a hybrid between two distinct cycles, are employed during raising. Typically, multivoltine into multivoltine, multivoltine into bivoltine, or bivoltine into bivoltine are crossed to create Nistari. Typically, multivoltine breeds like A23, B, G, etc. as well as KPGB, NB18, P5, etc. are employed. There are bivoltine breeds utilised. A thread called silk has a sericin - coated protein covering its fibroin core in the middle. The silk gland secretes silk. The fourth and fifth instar larva have a fully formed silk gland. Adults have a lifespan of 4 - 6 days. In women, it is larger than in men. It has a yellowish brown hue. Scales cover the body.

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Title of paper: Preservation And Conservation of Library Materials As Reflected Through Library And Information Science Abstract (1971-2009): A Review Work

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Preservation And Conservation Of Library Materials As Reflected Through Library And Information Science Abstract (1971-2009): A Review Work

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Abstract

The concept of preservation is included with the maintenance of libraries and archives since ancient times. Libraries need to preserve its collection in order to protect and preserve the history and culture of a nation for the posterity. Preservation is considered as the fundamental and an important task of the libraries. Traditionally some organic and natural methods were used to keep the books and other materials physically usable for a long time by slowing down or preventing their decay. Then we developed a more advanced way of preserving the materials in digital format. Though digital preservation needs constant attention still it is a long-term storage of information. This study is a review work from the Library and Information Science Abstract [LISA]. The study aims to know about the various traditional and digital methods of preservation and to identify the principal language of the research works and the journal in which maximum works were done.

Keywords: Preservation, LISA, Traditional Preservation, Digital Preservation

INTRODUCTION

Preservation is a branch of library and information science concerned with maintaining or restoring access to artifacts, documents and records through the study, diagnosis, treatment and prevention of decay and damage [9].

It is the protection of cultural property through activities that minimize chemical and physical deterioration and damage and that prevent loss of informational content. The primary goal of preservation is to prolong the existence of cultural property [1].

NEED FOR PRESERVATION

Preservation is a fundamental role and responsibility of the library. Libraries and information centers do not just collect materials; they also provide access and bring together various documents and research materials that are scattered worldwide while protecting the originals.

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So, preservation is needed to assure the long-term uninterrupted access to the intellectual content of the library's collections, either in original or in re-formatted form. Preservation allows for the continuity of the past with the present and the future [9, 10]. It is an ongoing activity that is a part of the normal workflow. Awareness of this & a sense of individual responsibility must be fostered. Library and archival collections represent an investment that preservation can protect.

In today's digital age the society is using digital technologies to create knowledge and share it.

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Open Educational Resources, Online Learning and Indian Initiatives

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Abstract: In the context of open education and online education, open educational resources (OER) play a very important role. Our whole education system is upgrading and at the same time being widely spread to reach out to the maximum learners wherever they are. Open educational resources aim to provide support to self-learning and life-long learning along with the formal education at different levels. The present paper aims to know about the open educational resources, how they started, their features, the pros and cons of OER, how they help in learning. The paper also studies the Indian initiatives on open educational resources and focuses on the role of libraries as well as LIS professionals in OER.

Keywords: Open Educational Resources (OER), Open Learning, Online Teaching and Learning, 5'R's of OER

1. Introduction

Open Educational resources (OER) are teaching learning materials that are freely accessible in the public domain in various digital formats. UNESCO first used the term "open educational resources" (OER) in 2002 to refer to ideas like "open teaching-learning resources. According to UNESCO, "Open Educational Resources (OERs) are any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use adapt and re-share them. OERs range from text books to curricula, syllabi, lecture notes, assignments, tests, projects, audio, video and animation" (UNESCO)

OER was originally mentioned at the UNESCO Forum on the Impact of Open Courseware for Higher Education in Developing Countries in 2002. The term "open content" was first used by David Wiley in 1998. The Cape Town Open Education Declaration was published on January 22, 2008, following a meeting in Cape Town in September 2007. In 2007, India embraced the OER movement after receiving backing from the government and other organisations. The OER movement in India seeks to enhance students' education by digitizing the current educational system^[2].

OER allows the learners to apply 5'R*. They are as follows:

- 1) Reuse—The resources can be used widely.
- 2) Retain – The content can be downloaded, stored i. e. it can be owned.
- 3) Revise – The content can be modified or altered.
- 4) Remix – The original content can be mixed up with other content to create something new.
- 5) Redistribute—The original or the modified content can be shared.

2. Literature Review

Open educational resources (OER) are an emerging trend in the educational field that aim to improve educational standards and democratize unrestricted access to knowledge. OER first appeared in 1985, when Richard Stallman established the Free Software Foundation to promote the free software movement and provide software users some independence (Caswell et al., 2008). Wayne Hodgins used the phrase "learning objects" in 1994 to describe electronic educational resources that may be distributed through the Internet (Wiley, 2006). The researcher found the following works when reviewing the literature from journal articles, books, conference proceedings, relevant websites, etc.

In 2016, Thakran and Sharma examined how open educational resources (OERs) could be used in Indian higher education in light of the country's disparate geographic access to educational opportunities and a shortage of trained professors. Both writers provided a concise review of OER projects in India that aim to remove the obstacles to higher education that are currently present. They concluded the paper with conclusions about the aforementioned programmes for the advancement of OEP in India (Thakran & Sharma, 2016).

In 2016, Dutta focused light on the opportunities and difficulties associated with OER in Indian higher education. In this regard, the author listed a few governments of India efforts, including SHAKSHAT, NKN, EKLAVYA, NMEICT, NPTEL, OSCAR, and E-grid. He concluded that India would not be able to compete with global standards without the distribution of excellent learning materials throughout higher educational institutions in India due to the country's inadequate academic and infrastructure capabilities (Dutta, 2016).

De Los Arcos et al. (2016) looked at how teachers in K-12 thought about using open educational resources (OER) in face-to-face, blended, and online classroom settings. According to the report, the majority of K-12 educators are not aware of the Creative Commons licence or the extent to which OER can be used with certain CC permissions. Additionally, they most frequently used videos, open

textbooks, photos, and quizzes as well as YouTube, TED lectures, Khan Academy, and iTunes as OER repositories. The survey also revealed that teachers used open educational resources (OER) more frequently in online and blended learning classrooms than in face-to-face classes. In the end, the researchers asserted that raising awareness among K-12 teachers about the open licenses is essential, but changing teachers' practices in searching for OER and sharing activities would be more critical in the future.

In 2018, Debnath conducted study on the utilization of free science courses are all available online in the world's largest repository^[3].

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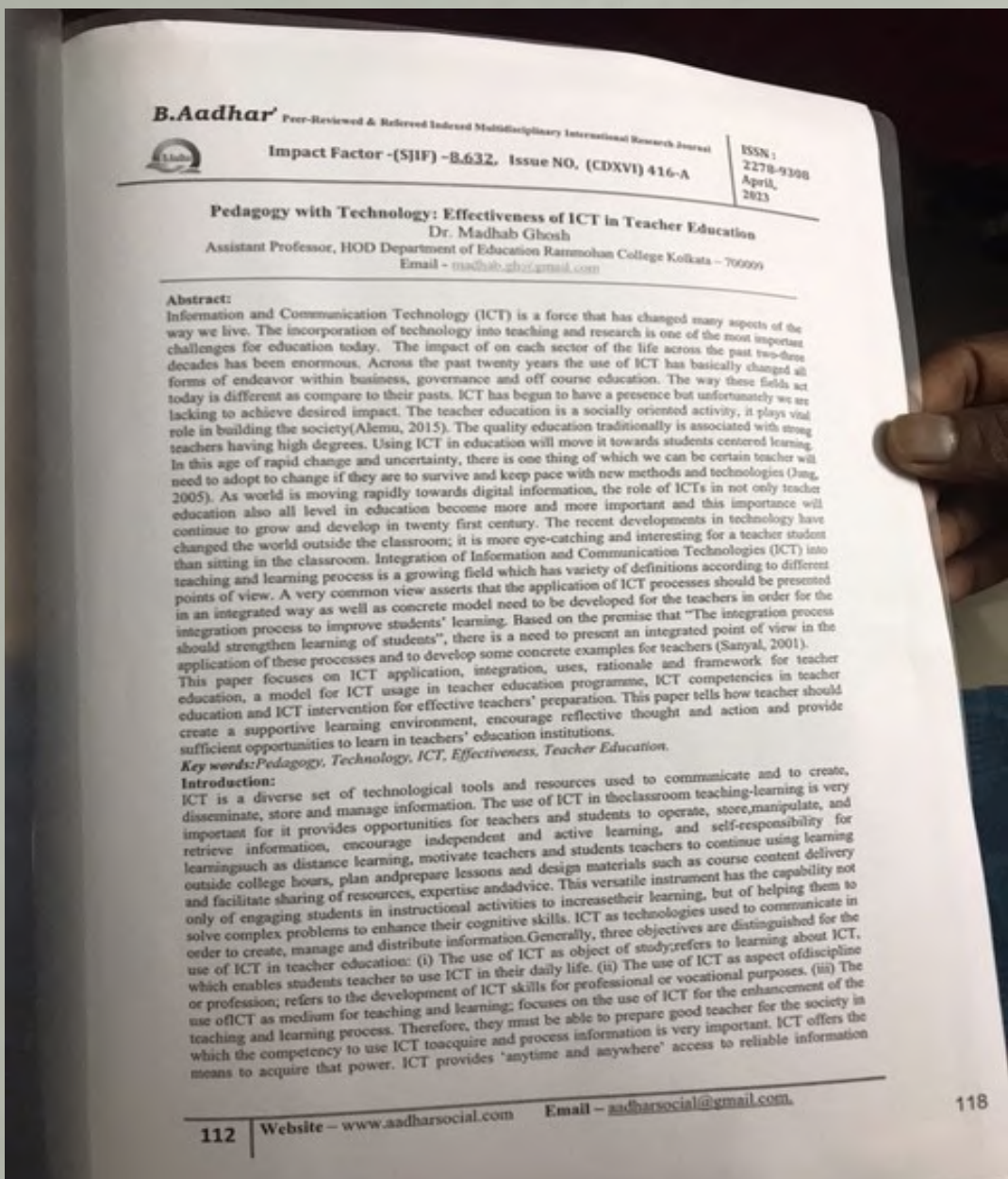
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Name of the teacher: Dr. Madhab Ghosh

Title of paper: Pedagogy with Technology: Effectiveness of ICT in Teacher Education



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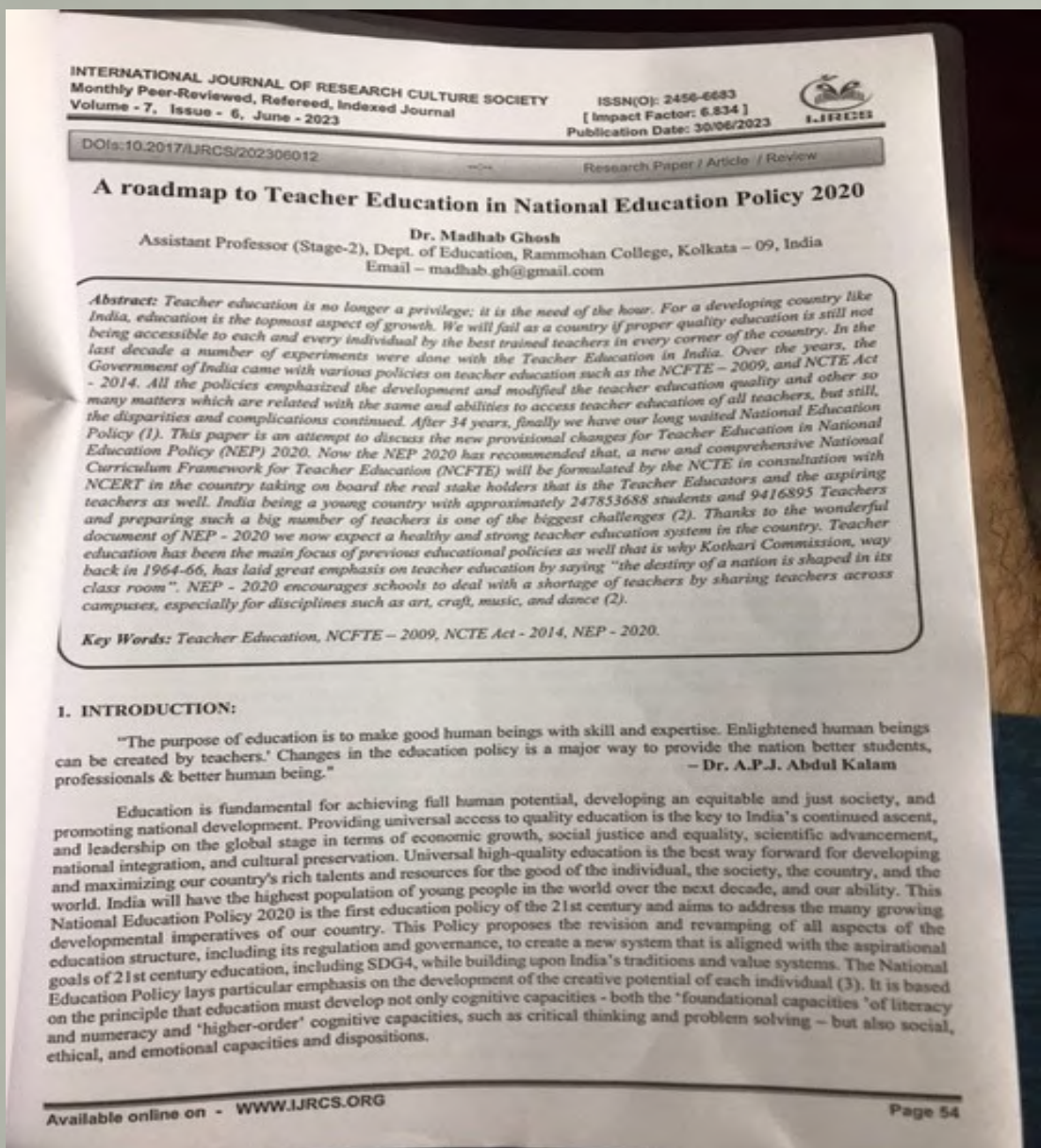
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