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4	Department of Geography,	Gargaon College, Sivasagar, Assam, India
5	Department of Geography	D.H.S.K. College, Dibrugarh, Assam, India
6	Department of Chemistry	Material Nanochemistry Laboratory, Institute of Advanced Studies in Science and Technology, Guwahati, Assam.
7	Department of Chemistry	Department of Physics Birjhora Mahavidyalaya, Assam
8	Department of Botany	Department of Botany, Goalpara College, Assam
9	Department of Botany	Department of Botany, B.N.College, Assam
10	Department of Botany	Department of Botany, Guwahati College, Guwahati, Assam
11	Department of Botany	Department of Botany Joyagogoi College, Assam
12	Department of Botany	Mycology and Plant Pathology Laboratory, Department of Botany, Gauhati University, Guwahati, Assam, India
13	Department of Botany	Department of Botany, Rangapara College, Rangapara, Assam, India.
14	Department of Botany	Department of Botany, Cotton University

15	Department of Botany	Department of Botany, Rajiv Gandhi University. Rono Hills, Doimukh 791112, Arunachal Pradesh, India
16	Department of English	Department of English, Bodoland University
17	Department of English	Girijananda Choudhury University, Guwahati
18	Department of Political Science	Department of Political Science, Gauhati University
19	Department of Political Science	Department of Political Science, Cotton College, Guwahati
20	Department of Political Science	B.Barooah College, Guwahati
21	Department of Economics	North Eastern Hill university, Meghalaya



An infrared thermography-based study on the variation in diurnal and seasonal land surface temperature at Dibrugarh city, India

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Abstract

The understanding of surface urban heat island pattern above Dibrugarh City has been studied through in situ observation using non-contact infrared thermometer for a period of 4 months by covering 16 selected locations. The chosen locations envelop both urban and suburban sites. The study draws attention to urban hot spots toward the central part of the city all through the different months in addition to the seasons, owing to heat retention supported by the built environment with fewer vegetation cover. Seasonally winter uncovered utmost variability of LST indicated by higher CV value. The core locations/sites witnessed a least amount of variability and continuity of higher LST throughout the learning months. At diurnal pattern, LST designated a sharp decrease from morning to afternoon period through winter months, while contrastingly summer months witnessed a sharp fall of LST from afternoon to night period. Among all the surfaces, asphalt pavement noticed maximum surface temperature with maximum variability in both diurnal and temporal scales. Maximum assimilation with fewer albedo of asphalt surface along with drier soil and grass comes across maximum LST in the internal part of the city. In addition, traffic, pollution and anthropogenic heat emission supported warmer surface temperature of asphalt, grass and bare soil, which on the whole put into the growth of higher surface heat. The stronger affirmative correlation coefficient amid the temperature of different surfaces with air temperature and comparatively weaker unconstructive correlation with relative humidity witnessed the dominant role of air temperature on overall surface urban heat island process.

Keywords LST · Diurnal scale · Variability · Surface temperature · Intensity

Introduction

Land surface temperature (LST) and its diurnal variation are crucial for the physical, chemical and biological processes of Earth. Climate-related studies were carried out to assess the environmental conditions and management practices on Earth surfaces, and their surrounding atmosphere requires LST information on a useful scale (Becker and Li 1993). Urbanization is a driver which brings a noticeable change in the natural surface of the Earth, and the natural surface is converted from bare soil or green area to the newly built surface (e.g., asphalt, stone, metal, concrete, etc.), thereby causing a change in the land cover. An urban heat island

is a happening in which urban air temperature is comparatively higher than the adjoining rustic air temperature (Choi et al. 2014). Urban heat island intensity is mainly restricted by synthetic constructions in the urban environment as a consequence of extensive urbanization and industrialization (Oke 1973; Voogt and Oke 2003). Increased thermal capacity and relatively lower potentiality of evapotranspiration together with artificial temperature intensify the procedure of heat island intensity (Roth et al. 1989). Moreover, urban heat island consequences can as well be connected to climate strictures (Sundborg 1950; Chandler 1965; Unger et al. 2001). Further, skyscraping buildings and narrow roads reduce horizontal airflow (Liu and Zhang 2011). The unfavorable consequence of UHI is intense urban climate and thermal uneasiness (Almusaed 2011), rising utilization of power (Akbari and Konopacki 1998) and increasing per head water consumption, particularly during summer season (Guhathakurta and Gober 2007). It also leads to cool

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In vitro evaluation of root, leaf and seed extracts of *Ricinus communis* and bio-control agents against Fusarium wilt of brinjal

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Brinjal or eggplant (*Solanum melongena* L.) is an important vegetable crop grown in Assam. *Fusarium* wilt disease of brinjal caused by *Fusarium oxysporum* is an important disease of all brinjal growing field which cause heavy losses to the farmers. The present investigation has been carried out with the antifungal activity of *Ricinus communis* viz. (root, leaf and seed) extracts and two species of *Trichoderma* inhabiting the pathogen *in vitro*. Result showed seed extracts of *R.communis* at 15% concentration 68% inhibition followed by root extracts 66.5% and leaf extract 58.4%. Among the two species of *Trichoderma* tested, *T.viride* was found to be most effective with 83% inhibition followed by *T.harzianum* 70.33% inhibition respectively over control after 7th days of incubation.

Key words:Antifungal, eggplant, extract, *Fusarium oxysporum*, *Ricinus communis*

INTRODUCTION

Brinjal is one of the most popular vegetables crop grown in India and other parts of the world. It can be grown in all season. It is cultivated as a food crop which has also many medicinal value (Daunay and Janick, 2007).The crop is suffers from more than 20 different diseases of which *Fusarium* wilt is the most destructive one throughout the world (Dwivedi and Enespa, 2013). It is caused by *Fusarium oxysporum* f.sp. *melongenae* which decreases the level of quality and quantity of eggplant's fruit.

Fusarium species are ubiquitous, soil-borne pathogens of a wide range of horticultural and food crops that damage vascular wilts, rots, and damping off diseases (Bodah, 2017).Symptoms initially appeared as leaf chlorosis, yellowing of foliage which later wilting and drooping of leaves. The xylem became brown in colour of the stem due to blockage of the vessel and finally sudden death of the above ground parts (Pietro *et al.* 2003).There are report from farmer that due to attack of *Fusarium* wilt the eggplant losses

yield 20%-30% Begum (2007).Wilt problems are especially severe in the humid tropics and it can cause upto 70% yield losses in Pakistan (Ashfaq *et al.* 2014).In view of the high cost of chemical pesticides and their hazardous to environment use of biodegradable different naturally occurring substances plant extracts which were less toxic, safe to use and eco-friendly gained importance of plant disease control (Duru *et al.* 2003; Saxena *et al.* 2005; Lee *et al.* 2007; Sitara *et al.* 2008).

Plant extracts of many higher plants have seen reported to exhibit antibacterial, antifungal and insecticidal properties under laboratories trials (Okigbo and Ogbonnaya, 2006; Mohana and Raveesha, 2006; Satish, 2007). Effective and efficient management of crop disease is generally achieved by the use of synthetic pesticides (Kiran *et al.* 2006). Biological control through the use of antagonistic microorganism for the development of integrated management strategy against the disease has emerged as a viable option (Alvandia and Natsuaki, 2009). Use of *Trichoderma* as a bio-control agent for control of soil borne plant pathogens has been described by (Morsy *et al.*, 2009; Sabalpara *et al.* 2009). Now different species of *Trichoderma* are used successfully to control

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ANTIOXIDANT ACTIVITY OF TRADITIONAL HERBAL DRUGS USED IN THE TREATMENT OF JAUNDICE

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Abstract: Jaundice is not a disease rather a symptom that can show up in several disease conditions. The manifestation of jaundice is due to the severe hepatic damage and excessive release of a yellow pigment called bilirubin to blood. The process of RBC destruction is called haemolysis and the jaundice caused this way is called haemolytic jaundice. The other two types of jaundice are called hepatocellular jaundice and obstructive jaundice. In our body, a balance between oxidative free radicals and antioxidants is usually maintained and this is a prerequisite for a normal health. Overloading with the free radicals and significant depletion in the supply of antioxidants lead to an act of imbalance termed as oxidative stress in health science. Oxidative stress causes haemolysis. Severe oxidative stress is considered one of the principal factors causing jaundice. The hepatoprotective property of certain herbal drugs may be attributed to their antioxidant potential. All plants produce chemical compounds as part of their normal metabolic activities. The curative properties of drugs are due to the presence of complex chemical substances of varied composition (present as secondary plants metabolites) in one or more parts of these plants. A large number of plant based materials are recognized as hepatoprotective herbal drugs, and these are traditionally being used for the reversal of jaundice in ethno-medicine.

Keywords: Jaundice, medicinal plant, traditional herbal drug, oxidative stress, free radical, antioxidant, haemolysis, bilirubin, hepatic damage, DPPH.

1. Introduction:

Jaundice is not a disease rather manifestation of severe hepatic damage and excessive release of a pigment, bilirubin, to blood. Yellow staining of the skin and eye caused by high level of bilirubin in blood is often termed as the incidence of jaundice [1]. Bilirubin is a lipophilic linear tetrapyrrole (Figure 1) which is toxic and insoluble in blood [2]. The colours of skin and eye of the affected person may vary depending upon the level of bilirubin [1].



Figure 1: Molecular Structure of bilirubin (C₃₃H₃₆N₄O₆) [1]

Accumulation of the pigment bilirubin in the blood stream may result from either over production of bilirubin or impaired hepatic metabolism of the pigment [3]. If the production of RBC in blood falls below normal as well as for any reason RBCs die at a faster rate than normal, then bilirubin can accumulate in the blood and cause jaundice



Understanding the influence of traffic volume on RST (road surface temperature) in Dibrugarh city of India

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Abstract

The basic objective of the study is to analyze the potential role of traffic and transportation volume on RST (road surface temperature) in the streets of Dibrugarh city. Additionally, the study evaluates the role of meteorological parameters on RST of the city. The experiment is accomplished by field measurement using HTC Non-contact IR thermometer over 11 selected streets of Dibrugarh city of Assam for a period of 4 months (August to November 2019). Diurnally, maximum RST is recorded in the mid-afternoon period (1.30–2.00 pm) in the month August and September. But interestingly, peak RST has been noticed in the late morning phase (11.30–12.00 pm) in the subsequent months of October and November. Seasonally, Monsoon acquires maximum positive growth of RST till mid-afternoon and rapid negative growth in the later periods. But post-monsoon reveals negative growth of RST since morning period. The study also found a varying degree of coefficient of correlation between traffic volume and mean RST. The degree of correlation is found as moderately positive in the morning and afternoon episodes during August. While September encountered moderately positive correlation only during afternoon and weaker towards the later part. Evidently, October maintains moderately strong correlation in the morning and evening sections, whereas stronger positive towards the later periods. And finally, November surprisingly displayed weak positive correlation in the morning periods to negative correlation in the successive episodes. Meteorologically, air temperature and relative humidity evidenced strong correlation with RST. Air temperature and RST accounted for a strong positive correlation with r value of 0.80 and 0.77 in monsoon and post-monsoon season, respectively. While relative humidity dominates strong negative correlation with RST with r value of -0.80 and -0.55 . Therefore, maximum traffic volume with higher air temperature and lower relative humidity is chiefly accountable for development of RST.

Keywords RST · Traffic volume · Air temperature · Relative humidity · Correlation

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Introduction

The study of road surface temperature (RST) in urban areas has become an integral part to deal with the effects and magnitude of urban heat island, especially for surface heat intensity. Furthermore, RST is useful procedure to predict and detect of the spatial pattern of nocturnal RST over an area (Thornes 1991) and developing thermal mapping of the urban areas. Such thermal mapping using RST data were initially used for detection of cold section of the road surface for deicing policies (Chapman and Thornes 2005). Nowadays, thermal mapping is also used as valuable tool for road weather forecasting and in maintenance of winter road (Todeschini et al. 2016). In addition to these, the thermal mapping is also used to spot the distinctiveness of RST distribution on individual routes. The results of such mapping also help to understand the segment differences

REVIEW



Recent development of modified fluorescent carbon quantum dots-based fluorescence sensors for food quality assessment

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Abstract

Food toxins are regarded as a major source of health risks, serious illnesses susceptible to even death. These dangerous pathogens may lead to significant economic impact worldwide. The food production chain undergoes different stages like harvesting, processing, storage, packaging, distribution, and lastly preparation, and consumption. Therefore, each step is susceptible to risks of environmental contamination. Nowadays, the carbon quantum dots (CDs) are regarded as one of the most widely used hybrid carbon nanomaterials due to their different magical physical and chemical properties. The CDs have a size below 10 nm and show the fluorescent property. The CDs find vast applications in different fields like sensing, food safety, drug delivery, bioimaging, catalyst, energy conversion, etc. Compared to other available methods, the fluorescence detection techniques have low cost, easy handling, and safe operating system. There is a need for a review to compile the fluorescence properties of carbon nanodots used to detect food pathogens. This brief review is addressed in that direction and mostly focused on the synthesis of carbon dots-based fluorescence sensors for detecting pathogens and toxins in foods and beverages. The detailed mechanisms and origin of fluorescence properties of carbon quantum dots are also highlighted herewith.

Keywords Carbon dots (CDs) · Fluorescence · Food toxin · Sensors · Top-down · Bottom-up

Abbreviations

CDs	Carbon dots
CQDs	Carbon quantum dots
GQDs	Graphene quantum dots
PL	Photoluminescence
CPDs	Carbonized polymer dots
PET	Photo-induced electron transfer
RET	Resonance energy transfer

1 Introduction

Food toxin management is nowadays a global food safety issue. These types of toxins may originate from different sources like environment having an organic or inorganic origin and contaminate foods [1]. Some examples are metals such as lead and copper, lead, iron, fluoride mercury, dioxins, bisphenol, polychlorinated biphenyls (PCBs), pesticides, herbicides, food coloring agents, preservatives, etc. Similarly, for some used drugs for people and animals, food packaging methods (migrant leaching) may contaminate water and may cause chronic toxic effects ultimately health hazards to consumers [2]. Toxicity depends on the health condition of individuals, age, dose and exposure cycle of toxin, etc. as well as the individual's susceptibility. There are long processes for getting food like harvesting, processing, storage, packaging, distribution, and lastly preparation, and consumption. Thus, there is a possibility to get contaminated food with pathogens at any stage of the food production process [3]. The human food contamination pathways are schematically shown in Fig. 1.

For food safety management, the most used instruments are chromatography and mass spectrometry like

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Quantitative documentation of traditionally used medicinal plants and their significance to healthcare among the Mishing community of Northeast India

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Abstract. Mishing community is one of the major tribal communities residing in Northeastern India. They have adapted their lifestyle with one of the adverse conditions and their reliance on plants for food and medicine is widely prevalent. This article presents an explorative ethnobotanical survey on documentation of plants used by the Mishing community of Assam in treating the common ailments as well as their mode of preparation and administration. Research was conducted in eight villages from four districts of Assam. Various participatory interaction methods, group discussions and semi-structured questionnaires were conducted with a total of 80 respondents. Plant importance analysis was done using four quantitative indices (Use value, Use report, Informant consensus factor and Fidelity level). In total, 153 plants under 126 genera and 62 families are recorded. Fabaceae (11 spp.) was the most dominant family and *Clerodendrum* and *Solanum* (5 spp. each) were the most dominant genera. The highest use values were recorded for *Musa balbisiana* (0.087) followed by *Paederia foetida* (0.075). Kidney stone has the highest Informant Consensus Factor value of 0.97 with 74 use reports for 3 species. A total of 7 species were found to have $\geq 90\%$ Fidelity Level and *Cissus quadrangularis* recorded the highest value, i.e. 93.7% FL for treating bone fracture with 75 use reports. In addition, a review of ethnomedicinal plants published in earlier literature for the community is presented, and 77 plants are reported as new ethnomedicinal records for the community. A list of bioactive compounds found in the presently reported plants is also listed. Though modern health facilities have gained pace in the developing countries like India, traditional medicine still co-exists with tribal communities as these are the nearest and reliable forms of treatment in Assam, exemplified by the high degree of reliance on it.

Keywords: Traditional medicine, Ethnobotany, Assam, Mishing, Quantitative analysis.

1. Introduction

1.1. Traditional medicine

Traditional medicine (TM), also known as complementary or alternative medicine, comprises the knowledge, skill, belief, theories and practices of an indigenous community that are used to diagnose, treat and cure any ailment as well as to maintain a healthy life. It has been used for centuries and recently it has gained a lot of attention in the developed countries as well (Mahomoodally, 2013). Herbal medicine is also a form of TM and addresses plants as active ingredients. It may be leaves, barks, fruits, seeds, roots, latex, and even complete plants (Pan et

NEW DISEASE REPORT

First report of leaf spot disease of *Tabernaemontana divaricata* caused by *Colletotrichum coffeanum* in India

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KEYWORDS

crape jasmine, shot-holes

Tabernaemontana divaricata (crape jasmine, pinwheel flower) is an ornamental, flowering, evergreen shrub in the family Apocynaceae (Jena *et al.*, 2019). It is native to India and other tropical regions in Asia. The different parts of the plant are used in traditional medicine for a range of pharmacological activities. In September 2023, black spot-like symptoms were observed on the leaves of *T. divaricata* near Gauhati University (26°9'14.8"N, 91°39'38.1"E), Guwahati Assam, India. At the early stage of infection, disease symptoms appeared as small, circular and yellow-halo spots and developed into angular brown spots in the later stages of infection. As the disease progressed, the leaf tissues around the spots became yellow and the lesions enlarged. Gradually adjacent lesions merged, became necrotic and shot-hole symptoms appeared (Figure 1).



FIGURE 1 Leaf spot symptoms observed in the field: (a) healthy plant of *Tabernaemontana divaricata*, (b) initial leaf symptoms and (c) matured leaf spot showing traces of shot-holes.

Twenty diseased leaves were collected from ten plants and washed in running tap water to remove soil and associated debris. The samples were surface sterilised using 70% ethanol solution, followed by 0.2% NaOCl solution, for one minute each, and were subsequently rinsed three times with distilled water (Omar *et al.*, 2018). The surface-sterilised infected leaves were cut into small fragments (5 × 5 mm²) using a sterile scalpel. Each fragment was transferred onto potato dextrose agar (PDA) plates and incubated at 28 ± 2°C for seven days. Hyphal tips growing from the fragments were sub-cultured on PDA. Pure cultures were produced by transferring the tips of fungal hyphae onto PDA plates. Colonies were cottony, white to pale orange, whereas the reverse side formed a pale orange to a central salmon colour

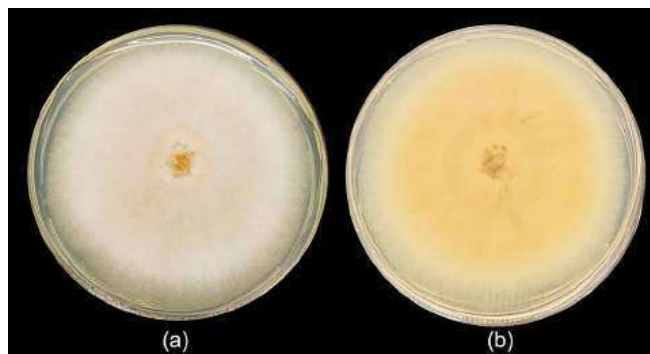


FIGURE 2 Cultural characteristics of *Colletotrichum coffeanum* (isolate TDCK 1) on potato dextrose agar medium: (a) front view and (b) reverse view after seven days' incubation.

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Microbes as a potential bioremediation tool for atrazine-contaminated soil: A review

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ABSTRACT

Atrazine is a controversial and widely used herbicide to control weeds in both agriculture fields and residential sites. Instead of adopting manual weed control, atrazine is being used by people who resulted in a negative impact on the environment. Therefore, removing atrazine in soil has received considerable attention. Microorganisms have terrific potential for degradation of hazardous pollutants which always motivates continuous bioremediation-directed research. The objective of this review is to identify, analyze, and compile all the studies on atrazine-degrading microorganisms. Particular emphasis is made on the atrazine degradation pathways, a diverse group of bacteria, fungi, and yeast along with the genetics and enzymology aspects of degradation. The present review may act as a source of information for developing a cheaper and microbiological method for rescuing the atrazine-contaminated soil and water in the future.

1. INTRODUCTION

The widespread and long-term use of chemicals including atrazine (2-chloro-4-ethylamino-6-isopropylamino-1,3,5-triazine) herbicide in both agriculture and non-agricultural field is still a severe concern today. These compounds have the potential to runoff and leach through the soil leading to surface and groundwater contamination [1]. Most attentively, atrazine can cause serious human health problems such as endocrine disruption, central nervous system, reproductive system, immune system, and carcinogenic disorders [2]. Atrazine inhibits photosynthesis efficiency, superfluous energy dissipation in electron transport, and destroys cellular structure which resulted in the inhibition of growth in algae [3]. Moreover, atrazine has a moderately persistent, long half-life, and high mobility in soil than some other herbicides. Due to its high toxicity, persistence, and mobility in the environment, atrazine was prohibited by the European Union in 2004 [4], but it is still one of the most extensively used herbicides against weeds today in several countries, for example, annually 23 million kg in the USA [5], 27 million kg in Brazil, 16 million kg in Argentina [6], and 3 million kg in India [1]. Therefore, for a safe and sound environment, the rapid abolition of atrazine from the contaminated site has become very crucial.

Microorganisms have tremendous potential for bioremediation and herbicide degradation due to the presence of various catalytic enzymes [7]. The presence of such characteristics, microorganisms can degrade atrazine into different metabolites that act as a source of energy for other organisms. Many strains have been reported for their abilities in atrazine mineralization including members of the genera *Pseudomonas*, *Bacillus*, *Burkholderia*, *Arthrobacter*, *Enterobacter*, and *Norcardioides* [8-11]. In addition, several fungal species belonging to the genera *Fusarium*, *Aspergillus*, *Penicillium*, and *Pleurotus* have also been isolated and studied for degradation of atrazine [2,12,13]. Therefore, microorganisms can be chosen for easy and better strategies for the rescue of atrazine polluted sites ecofriendly.

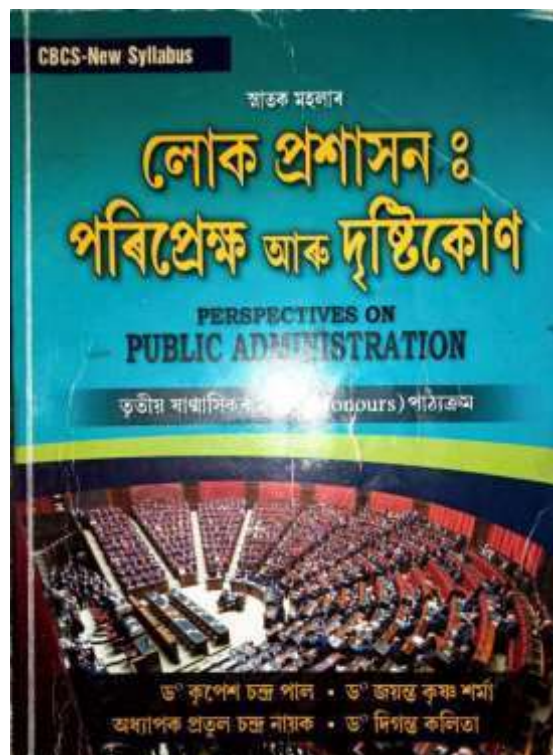
In recent years, several review papers have been published on the degradation of atrazine in different aspects such as the impact of atrazine in the aquatic environment, technologies used to reduce the toxicity of atrazine as well as advantage and disadvantages [14,15]. In 2021, a similar review was published by Abd Rani *et al.* [16] that focused on only bacteria while fungi and yeast are neglected. In contrast, this review is a humble attempt to accumulate all the microbes associated with atrazine degradation in a single article that has already been gathered through vigorous research. This article also presents the clear degradation pathways along with the genes and enzymes involved in atrazine-degradation. This review will help researchers to develop a cost-effective and efficient microbiological technology for the remediation of atrazine-contaminated soil.

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ভাৰতীয় শিক্ষাবোর্ড, ত্ৰিচলয় বিশ্ববিদ্যালয় আৰু ব্যৱসায়িক বিশ্ববিদ্যালয়ৰ জাতক মহলাৰ ২০১৯-২০
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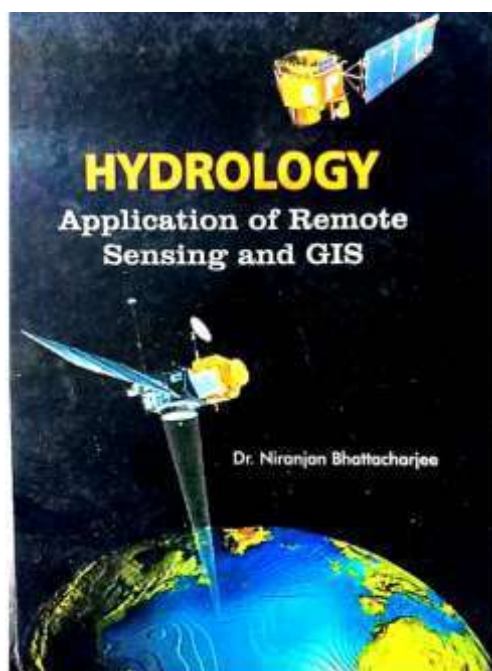
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[Perspectives on Public Administration]

তৃতীয় বাছ্যাত্মক সন্মান (Honours)ৰ বাবে

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**A GIS Based Approach to Evaluate Bank
Erosion, Accretion and Bank Line Migration along
Kaziranga National Park, India**

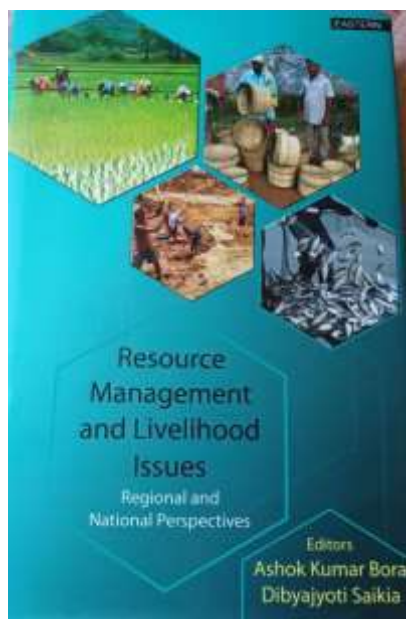
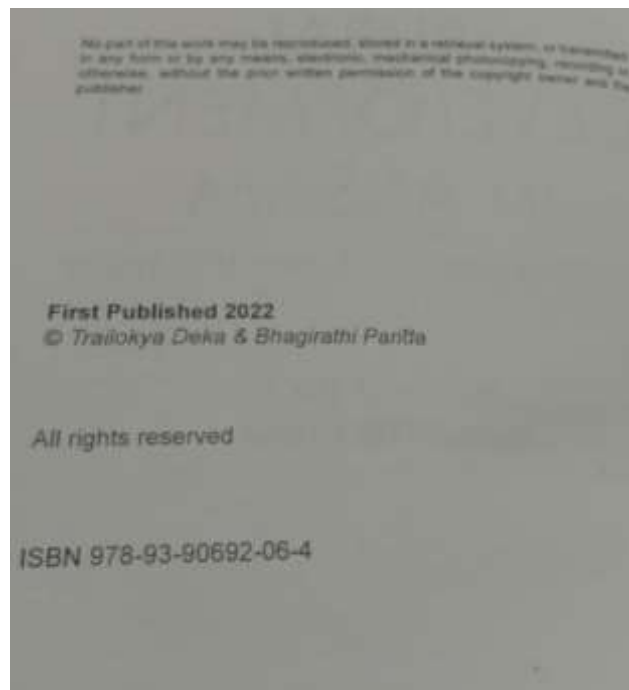
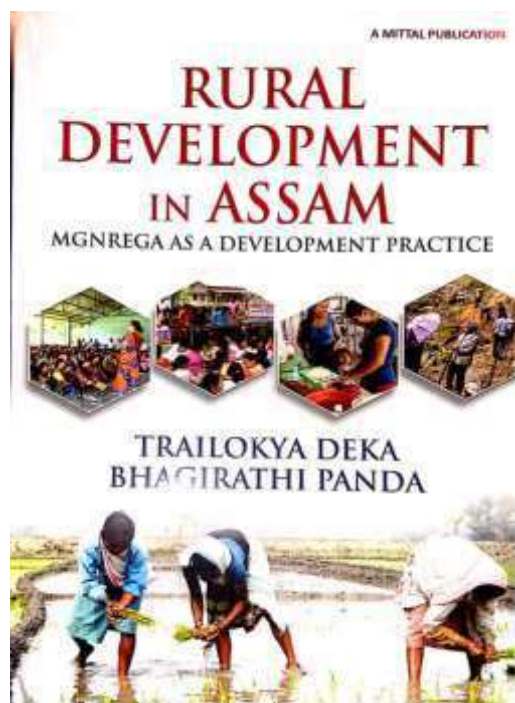
Ritunjay Neng
Ritunjay Lakkar

Abstract

The present study on the Kaziranga National Park, located in the north bank of Brahmaputra River in Assam reveals that the area is being continuously eroded by bank line migration and bank erosion. The north bank of Brahmaputra river experiences erosion indicated by retreating bank line at an average rate of 8.42 m/yr, while the south bank of Brahmaputra river experiences accretion and progression of bank line at an average rate of 30.2 m/yr by deposition. The sediment fill up in the north bank and erosion in the south bank cause expansion and contraction movement of Brahmaputra River channel and its associated changes of the national park. Erosion of the study area is accelerated by flooding pattern or local loss of the river channel leading to change flow towards banks. The sediment progression of the river channel along with widening of the channel at an annual rate of 1.08 m/yr of area caused a net erosion of 74.11 sq km and deposition of 33.82 sq km at Kaziranga National Park with net reduction of 40.29 sq km of area. Thus due to erosion, surface area of the Kaziranga National Park has been reduced to 378.529 sq km from 423.789 sq km during the period of 45 years (1973-2017) with an annual reduction rate of about 2.00 sq km of area.

Introduction

In a general sense river bank erosion is breaking down or carrying away the bank of the river by itself and it affects the changes in river channel courses (Fujita et al. 2000). Erosion and deposition of a particular river is driven by physical, geological and hydro-meteorological parameters. Bank line shift or bank line migration is a normal morphological behavior of a river. The bank erosion process in several sections of the river network is influenced by the size of the channel, discharge, and flow velocity (Petersen et al. 2009). River banks can move away (erosion) or can advance (deposition) which can result in lateral migration, channel avulsion and change in channel width (Bartley et al. 2009). The humid monsoonal region of Asia provides a common playground for channel variations, channel diversions and frequent bank line shift resulting from bank erosion and deposition (Neng, 2017). Brahmaputra River located in the historically active zone in the Assam represents dynamics of the bank lines. The Brahmaputra River is one of the largest alluvial rivers in the world.



Resource Management and Livelihood Issues: Conceptual and Theoretical Framework

*Inka Devi
Ashok Kumar Bora*

Introduction

Environment has various materials available in its basket which help us to satisfy our needs and requirements. These materials become resources when human value them. With the passage of time and development of technology, the uses and values of resources change. The spatial distribution of resources is also not uniform. There are resources which are finite, while some others can be replenished at varying rate. Therefore, it can be stated that the usage and availability of resources change from time and culture to quality and quantity over time and space. In the beginning of the process of evolution of man and his society, men had limited wants and requirements. All the aspects of human life were stated to be controlled by physical environment. Human activities were confined to partial fulfilment of basic needs. In the same way, the utilisation and extraction were also limited.

With a gradual success of men over the nature's law and control, there was shift in paradigm. Now, men have become capable of altering his physical environment to suit themselves. Human beings applied their skill, mind and power

Compendium of plants used for preparation of traditional alcoholic beverages by four major ethnic communities of Assam, northeast India

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Abstract. Borah D, Gogoi T, Sarma J, Borah PJ, Gohain B, Mili C, Upadhyaya A, Basumatary J, Neog K, Wangpan T, Tangjang S. 2021. Compendium of plants used for preparation of traditional alcoholic beverages by different major ethnic communities of Assam, Northeast India. *Biodiversitas* 22: 2019-2031. This paper deals with the ethnobotanical research on the preparation of traditional alcoholic beverages by *Ahom*, *Bodo*, *Karbi* and *Mishing* ethnic communities of Assam, India. Along with the information on preparation, the plant species associated with the preparation of alcoholic beverages are also recorded. Field investigations were conducted to cover 32 villages of six districts of Assam, India. The data was generated from 202 respondents using participatory rural appraisal tools including semi-structured questionnaires and personal interviews. The plant species were collected, identified and submitted in the Herbarium of Rajiv Gandhi University, Arunachal Pradesh, India. The study recorded 129 plants falling under 107 genera and 54 families which are exclusively used for the preparation of alcoholic beverages by the studied communities. The study confirmed that the association of traditional alcoholic beverages with their rich indigenous knowledge. The finding also revealed varied forms of protocol followed by these tribes to prepare traditional liquors and the starter cakes for brewing of alcohol were prepared locally. However, the *Mishing* tribe was known to prepare unique rice beer known as *Po:ro apong*, as the preparation technique and extraction process of this liquor was slightly different. Distillation of alcohol was also observed in all the communities except the *Ahom*. The rich traditional knowledge of brewing alcohol and the plant species used in the process were worth documenting considering the on-going alteration of traditional society with the modernization.

Keywords: Alcoholic beverage, ethnobotany, Northeast India, traditional knowledge, tribal society

INTRODUCTION

Fermentation and fermented beverages have always been an integral part to human cultures and traditions since ancient times (Alan 1997). The beer is supposed to have originated in Sumeria before 7000 B.C. (Demain et al. 1998). Traditionally prepared fermented beverages have always been associated with the values and survival of the tribes throughout the world since the dawn of civilization (Alan 1997). It is assumed that the preparation of traditional wine, beer and their varieties in consumption may have probably emerged due to the varied climatic conditions and was heavily dependent on the availability and utilization of locally available natural resources (Roy et al. 2004). The fermented rice beverages of the tribal people are prepared using various plants which are known to possess numerous medicinal properties. It has been reported that the phytochemical components present in these plant species proved to have remarkable therapeutic potential when used alone or in combinations (Prakash et al. 2004; Bhuyan and Baishya 2013). These forms of traditional alcoholic beverages have a considerable impact

on health care and provide health benefits of preventing and treating gastrointestinal diseases along with certain physiological disorders (Nath et al. 2019) such as insomnia, headache, diarrhea, body ache and inflammation of body parts, expelling worms along with the treatment of cholera and urinary problems (Samati et al. 2007; Deka and Sarma 2010; Nath et al. 2019). Several reports from different parts of Northeast India have also been claimed the presence of nutritional as well as antioxidant properties in rice beer samples which is due to the presence of compounds such as phenolic acids, polyphenols, and flavonoids (Nath et al. 2019).

Assam is home to diverse ethnic communities and tribal groups, mostly of Mongoloid origin, such as *Ahom*, *Rabha*, *Deori*, *Tiwa*, *Bodo*, *Karbi*, *Mishing*, *Sonowal* *Kachari*, etc. (Sharma 2017). These communities have been preparing and consuming traditional rice beer for about 2500 years and possess a good deal of knowledge about fermented food products (Tamang 2010). As such, a variety of cereal-based alcoholic beverages are prepared and consumed by these communities during many occasions such as ritual ceremonies, marriages and merry-making, festivals and



The Wretched of the Dickens: Deconstructing race-relations in Paul Beatty's *The Sellout*

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Abstract: *The construction of the idea of a race and racial prejudice has long been seen as detrimental to a progressive society. Racial stereotyping and domination of “inferior race” within the matrix of racial classification have led to violent atrocities around the world. In recent times the protest campaign #BlackLivesMatter after the killing of George Floyd in the USA once again brought to fore how structural discrimination can exist in a society which was founded on the ideals of Equality, Justice and Fraternity. Floyd’s lynching was not an isolated incident in the history of America, as there have been regular occurrences and practice of racial discrimination in the most advanced societies. Whereas social activists continue to protest against such atrocities, the creative writers are also registering their protest through literary works. Paul Beatty’s fiction *The Sellout* has addressed this racial issue very conspicuously through the use of satire, irony and dark humour. This paper aims to read this novel within the theoretical framework of “Critical Race Theory” to argue that the so-called legal social agencies which promise to ensure justice to one and all are in fact hegemonic entities controlled by white-supremacist capitalist forces. The paper examines this thesis by bringing in incidents depicted in the novel alongside the socio-historical episodes of racial discrimination as recorded in other literary and critical works.*

Keywords: *Critical Race Theory, Black Lives Matter, Racial Discrimination, The Sellout, Slavery.*



Date: January 23, 2024

Time: 11.40 AM- 1.40 PM

Session 1: Panel D

Chairperson: Dr. Jilmit Bora

Moderator: Ms. Anisha Bordoloi

Room no: 422

Sl. No.	Presenter's Name	Affiliation	Title of the Paper	Sub-Theme
1	Dr. Birinchi Kumar Das	Principal, Barpeta Girls' College	Problems of Double - Translation: A Study of the Assamese Translation of Mikhail Sholokhov's 'And Quiet Flows the Don'	Literature and translation
2	Ms. Himadri Gogoi Ms. Sukanya Chakravarty	Assistant Professor, Golaghat Commerce College B P Chaliha College	Beyond Enchantment: Gender, Exoticism, and Identity in 'Black Magic Women' by Moushumi Kandali	Literature and translation
3	Dr. Hemasri Devi	Assistant Professor, Pub Kamrup College	Namghar: A Platform of Collective working in reference to Mishing Socio-Political and Cultural life	Indigenous traditions, rituals and practices
4	Ms. Sudipta Karmakar	Assistant Professor, K.C.Das Commerce College	A study of Kamala Das' selected poems as her weapon for raising her voice against the patriarchal society and quest for identity.	Literature and Translation
5	Ms. Sukanya Barthakur Dr. Sampurna Bhuyan	Research scholar Girijananda Choudhury University Associate Professor, Girijananda Choudhury University	Advancing Business Practices through Integrative Indigenous Management - A Focus on Strategies for Sustainable Development	Integrative indigenous management
6	Dr. Shahidul Islam	Asst. Professor, Dept. of English Binandi Chandra Medhi College, Ramdia,	Importance of ICT for the effective class room teaching-learning process in the educational institutes of Assam: A study based on some selected Secondary schools of rural areas of barpeta district	AI in language teaching and learning
7	Mr. Joel Lahmingthanga Marah	Research Scholar William Carey University	Comparative analysis of Kamala Das's My Story and Amy Pachau's, The Unmarriageables	Community and Identity
8	Dr. Indira Gazieva	Associate researcher, Russian State University for the Humanities (RSUH)	The situation around endangered indigenous languages in Russia	Community and Identity

