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**ROLE OF ANIMAL SCIENCES IN NATIONAL
DEVELOPMENT**

Volume 5

Recent Trends in Animal Sciences

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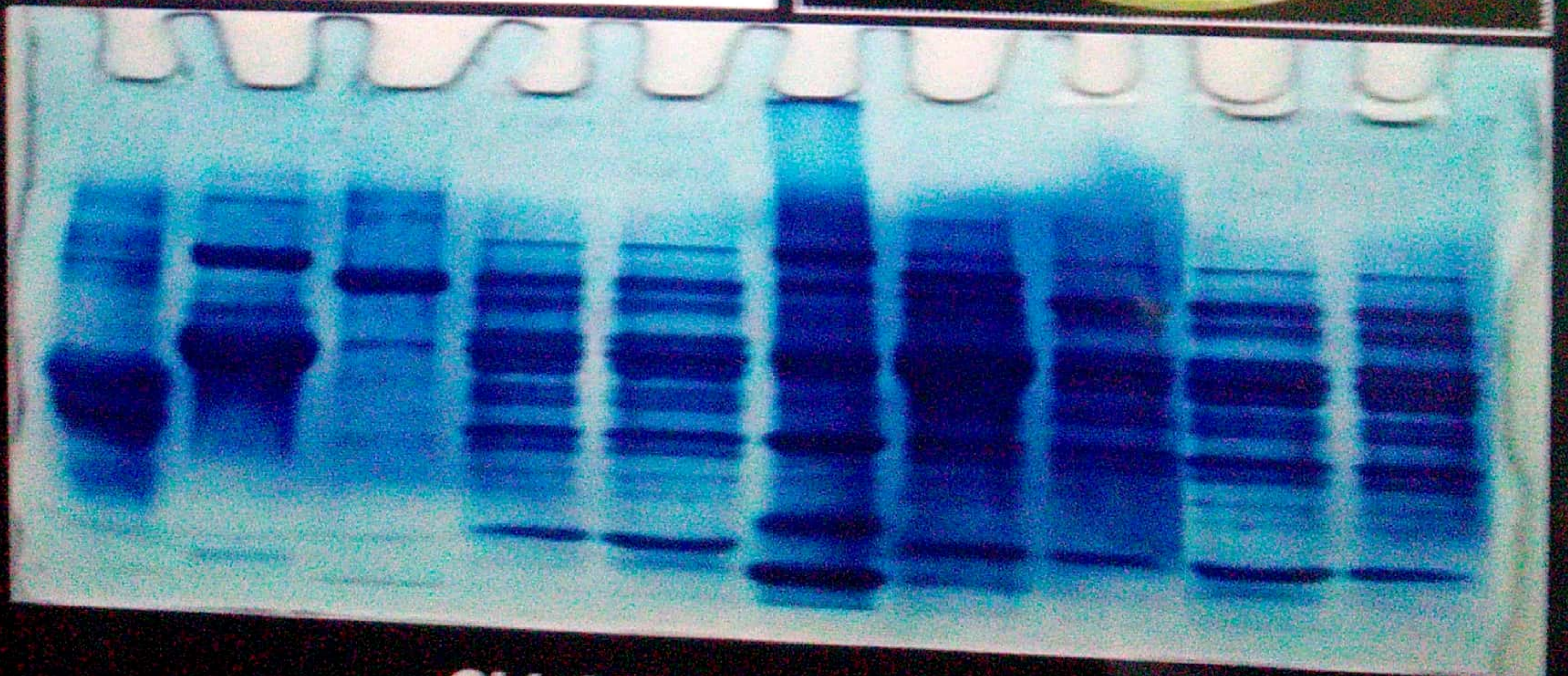
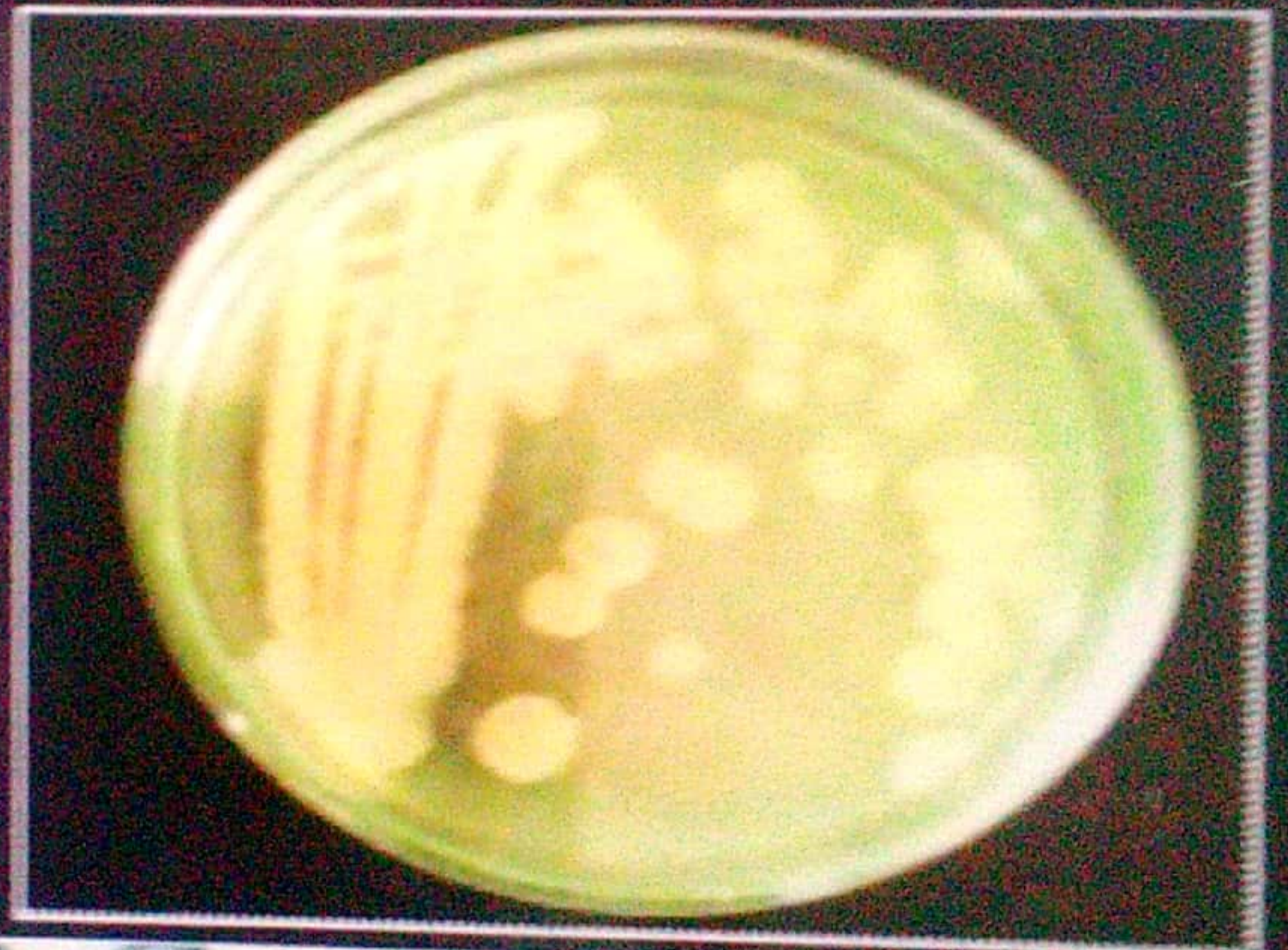


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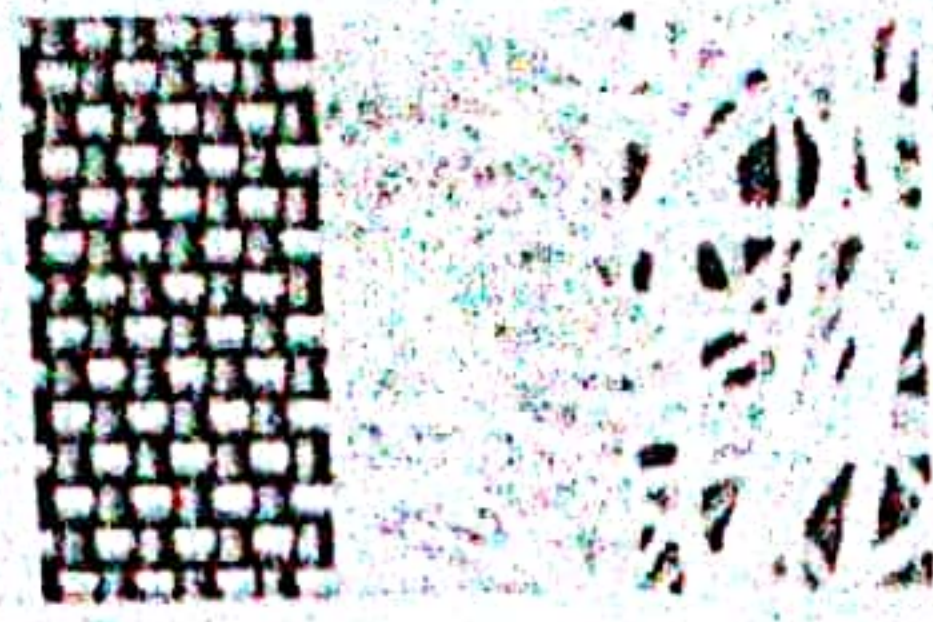


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and Nanocomposites*

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Energy Transfer Studies using Binary Mixtures of Laser Dyes in Solvent and Polymer Media

Lohit Naik¹ and G.H. Malimath²

^{1,2}UG and PG Department of Physics, Karnataka Science College, Dharwad, Karnataka.
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Highlights—

- In the present study, the energy transfer between the laser dyes POPOP and Coumarin-334 in toluene and PMMA matrix are carried out from steady state method.
- Energy transfer efficiency (E_T), critical transfer distance (R_0), Bimolecular quenching constant (K_Q) and Translation diffusion rate parameter (K_d) were calculated.
- Considerable increase in fluorescence intensity, Energy transfer efficiency (E_T) and Bimolecular quenching constant (K_Q) in PMMA matrix as compared to liquid system for both the pairs has been observed.

In the present work, we have carried out energy transfer studies using laser dyes 5-phenyl-2(4-(5-phenyloxazol-2-yl)phenyl)oxazole (POPOP) as donor and 9-acetyl-2,3,5,6-tetrahydro-1h,4h-11-oxa-3a-aza-benzo[de]anthracen-10-one (Coumarin-334) as acceptor in liquid (Toluene) and polymer (PMMA) media using steady state method. Bimolecular quenching constant ($K_Q = 6.43 \times 10^{12} \text{ mol}^{-1} \text{ s}^{-1}$ in toluene and $2.53 \times 10^{14} \text{ mol}^{-1} \text{ s}^{-1}$ in PMMA matrix), Translation diffusion rate parameter ($K_d = 1.27 \times 10^{10} \text{ mol}^{-1} \text{ s}^{-1}$ in toluene) and critical transfer distance ($R_0 = 48.35 \times 10^{-10} \text{ \AA}$ in toluene and $91.24 \times 10^{-10} \text{ \AA}$ in PMMA matrix) were calculated. It is observed that, Bimolecular quenching constant is more than the translation diffusion rate parameter. Hence, these results suggest that overall energy transfer is due to Förster Resonance Energy Transfer (FRET) between donor and acceptor in both the media. Further, It is also observed that, there is a considerable increase in energy transfer efficiency in polymer matrix than liquid media with increase in acceptor concentration. Hence these results suggest that, POPOP- Coumarin-334 pair doped in PMMA matrix may have potential applications such as Energy Transfer Dye Lasers (ETDL) to improve the efficiency, preforms of optical fibers for amplification & tunability and for polymer scintillation detectors.

Photophysical Properties of Laser Dye Coumarin 102 by Computational and Solvatochromic Methods

C.V. Maridevarmath, Lohit Naik and G.H. Malimath

UG and PG Department of Physics, Karnataka Science College, Dharwad, Karnataka.

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Highlights—

- Ground and excited state dipole moments of laser dye coumarin 102 were determined from *ab initio* computations using (TD-DFT) and different solvatochromic correlations.
- The observations suggest that, the probe molecule (C102) can be considered as a potential candidate for designing luminescence materials, fluorescent probes and for non-linear optical materials.

In the present study, the ground (μ_g) and excited state (μ_e) dipole moments of laser dye coumarin 102 (C102) were determined theoretically from *ab initio* computations by using (TD-DFT) calculations with the help of Gaussian 09W software and the results are found to be (μ_g) = 7.033 D, (μ_e) = 7.145 D respectively. Experimentally the ground state dipole moment was determined by using Guggenheim (μ_g = 1.884 D), Higassi (μ_g = 3.694 D) and by solvatochromic method (μ_g = 1.257 D). The excited state dipole moments were also determined by using solvatochromic correlations like Lippert's (μ_e = 8.589 D), Bakhshiev's (μ_e = 5.874 D), Kawski-Chamma-Viallet's (μ_e = 5.434 D), solvatochromic (μ_e = 5.251 D), solvent polarity parameter (μ_e = 4.412 D), McRae's (μ_e = 5.372 D) and Suppan's (μ_e = 9.380 D) equations respectively. The observed higher values of excited state dipole moments in all the methods implies that, the probe molecule (C102) is more polar or stable in the excited state than in the ground state. The change in dipole moment ($D\mu$) estimated from solvatochromic method and solvent polarity parameter indicate the presence of intramolecular charge transfer (ICT), which may be responsible for the increase of dipole moment in the excited state. The presence of ICT was further confirmed by measuring the HOMO-LUMO band gap through DFT computations and also from absorption threshold. Further, using Kamlet-Abboud-Taft and Catalan parameters, the solute-solvent interactions were investigated by multiple linear regression analysis, which suggested that, non-specific dielectric interactions of solvents like polarizability/dipolarity control both the excitation spectra and stoke shift of the probe molecule. However, the spectroscopic properties of (C102) molecule are less sensitive to hydrogen bonding characteristics of solvents. Further, the reactive centers like electrophilic site and nucleophilic site which are useful in understanding the photochemical reactions were also identified with the help of molecular electrostatic potential (MESP) 3D plots by using TD-DFT computational analysis. These observations suggest that, the probe molecule (C102) can be considered as a potential candidate for designing luminescence materials, fluorescent probes and non-linear optical materials.

International conference on advanced polymer science held at Dept of chemistry, Velloru institute of technology, Tamilnadu on October 24-26, 2016.

PO-13

Studies on enhancement of energy transfer efficiency using binary mixtures of laser dyes in solvent and PMMA matrix.

Lohit Naik and G.H.Malimath*

UG & PG Department of Physics, Karnataka Science College, Dharwad-580001, Karnataka, India

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In the present studies, we have carried out energy transfer studies using laser dyes 5-phenyl-2(4-(5-phenyloxazol-2-yl)phenyl)oxazole (POPOP) as acceptor and P-terphenyl (PT) as donor in liquid (Toluene) and polymer (dye doped PMMA) media using steady state method. Bimolecular quenching constant ($K_q = 4.03 \times 10^{12} \text{ mol}^{-1} \text{ s}^{-1}$ for toluene and $6.51 \times 10^{14} \text{ mol}^{-1} \text{ s}^{-1}$ for PMMA matrix), Translation diffusion rate parameter ($K_d = 1.61 \times 10^{10} \text{ mol}^{-1} \text{ s}^{-1}$ for toluene) and critical transfer distance ($R_0 = 34.34 \text{ \AA}$ for toluene and 65.25 \AA for PMMA matrix) were calculated. It is observed that, Bimolecular quenching constant is more than the translation diffusion rate parameter. Hence, these results suggest that overall energy transfer is due to Förster Resonance Energy Transfer (FRET) between donor and acceptor in both the media. Further, it is also observed that there is excellent increase in fluorescence intensity (2000 to 8000 AU) and energy transfer efficiency in dye doped polymer matrix system as compared to liquid media and the results are given Table-1. The results suggest that these donor-acceptor pair doped in PMMA matrix may have potential applications such as Energy Transfer Dye Lasers (ETDL) to improve the efficiency, preforms of optical fibers for amplification & tunability and for polymer scintillation detectors.

Table.1: Energy transfer efficiency (E_T) (%)

Acceptor concentration ($\times 10^{-4} \text{ M}$)	E_T (%) in toluene	Acceptor concentration ($\times 10^{-5} \text{ M}$)	E_T (%) in PMMA matrix
1	24.91	1	38.02
2	30.40	2	51.17
3	45.49	3	60.46
4	53.73	4	73.54

References:

1. Viagin, O; Masalov, A; Bepalova, I; Zelenskaya, O; Tarasov, V; Seminko, V; Oloshina, L. *J. lumin.* **2016**, *179*, 178–182.
2. Deepa, H R; Thipperudrappa, J; Suresh Kumar, H M. *Can. J. Phys.* **2014**, *92*, 302–306.
3. Yang, Y; Lin, G; Zou, J; Wang, Z; Wang, M; Qian, G. *Opt. Comm.* **2007**, *277*, 138-142.



PC - 039

Energy Transfer Studies Between Derivatives of 1,3,4-Oxadiazoles & C-334 in Liquid & Polymer Media

**Lohit Naik^a, Narahari Deshapande^b, Imtiyaz Ahamed M. Khazi^b
and G. H. Malimath^a**

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^bCPEPA, Department of Chemistry, Karnatak University, Dharwad -580003, Karnatak, India

E-mail: gurukcd@gmail.com

Förster resonance energy transfer (FRET) & energy transfer efficiency studies were carried out on newly synthesized 1,3,4 oxadiazole as donor & C334 as acceptor in ethanol & PMMA matrix following steady state & time resolved fluorescence methods. Translation diffusion rate parameter (k_d), Bimolecular quenching constant (k_q), critical transfer distance (R_0) & energy transfer efficiency (E_T) were calculated. In both the media, higher values of R_0 confirm the efficient FRET from donor to acceptor.

DAE-BRNS 14th biennial Trombay symposium(International) on Radiation and Photochemistry held at BARC, Mumbai on January 3-7, 2018. ISBN NO. 81-88513-84-9.

Photophysical Properties of two Novel Benzofuran-3-Acetic Acid Hydrazide Derivatives

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The ground and excited state dipole moments of two newly synthesized benzofuran-3-acetic acid hydrazide derivatives (5-methyl-benzofuran-3-yl)-acetic acid hydrazide [5MLBH] and (5-methoxy-benzofuran-3-yl)-acetic acid hydrazide [5MOBH] are determined by solvatochromic shift methods and from ab initio computations using DFT method. The reactive centers like electrophilic site and nucleophilic site were identified with the help of MESP 3D plots by using TD-DFT computational analysis.

Ground and Excited State Properties Of Thiadiazole Derivative by Experimental and Theoretical Approach

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^cDepartment of physics, M.S.Ramaiah Institute of Technology, Bangalore - 560054, Karnataka, India

Abstract

steady state absorption and fluorescence spectroscopy of 5-bromo-2-(naphthalene-1-ylmethyl)-6-phenylimidazo[2,1-b][1,3,4]thiadiazole(5BNPT) in different solvents were carried out to understand ground and excited state properties. The experimental data pointed out a significant bathochromic shift of the emission maxima in polar solvents. Considering the dependence of Stoke's shift on solvent polarity, the dipole moments of ground state (μ_g) and excited state (μ_e) upon excitation were estimated from Lippert, Bakhshiev, and Kawski-Chamma-Viallet equations. Further, the ground state dipole moments are calculated using DFT/6-31g* / basis set and are compared with experimental values.

Introduction

1,3,4-thiadiazoles have attracted the researchers all over the world to work in this area of new drug development due to their antimalarial, muscle relaxants, antitumor, lipid peroxidation inhibitor, antimicrobial, and remarkable analgesic, anti-convulsant, diuretic, hypnotic and sedative properties. They are known to exhibit anticorrosion, liquid crystal, optical brightening and fluorescent properties.

Experimental

The sample used and all the other solvents and chemicals were of spectroscopic grade and were used without further purification. Absorption and Fluorescence spectra were recorded using HITACHI 50-20 UV-Vis & F - 2000 Spectrophotometers at fixed 10^{-4} M concentration in each solvent.

Results and Discussion

Steady state fluorescence spectra of 5BNPT in different solvents (1.8D-47D) were found to be quite sensitive to the increase in solvent polarity in the form of a marked red shift of the fluorescence band (292-342nm) and also the solvent polarity dependent red shift in the fluorescence band is accompanied by increase in Stoke's shift ($3347-8213\text{cm}^{-1}$). However slight shift in absorption maxima is observed with increase in solvent polarity. From the slopes of $\bar{\nu}_a - \bar{\nu}_f$ Vs $F_1(\epsilon, n)$, $\bar{\nu}_a - \bar{\nu}_f$ Vs $F_2(\epsilon, n)$, and $1/2(\bar{\nu}_a + \bar{\nu}_f)(\bar{\nu}_a + \bar{\nu}_f)$ Vs $F_3(\epsilon, n)$ plots and using Lippert, Bakhshiev, and Kawski-Chamma-Viallet equations, the dipole moments of ground state (μ_g) and excited state (μ_e) and the increase in the dipole moment value ($\Delta\mu$) upon excitation were estimated and are given in table. Further, the ground state dipole moments are calculated using DFT/6-31g* / basis set and are compared with experimental values. There is a good agreement between the theoretical and experimental values of ground state dipole moments. It is observed that dipole moment of excited state

International conference on Material science and ionizing radiation safety and awareness(ICMSIRSA -2016) held at shivaji university, Kolhapur on 28- 30 January, 2016.

Study of Molecular Interactions in Binary Liquid Mixtures of Methyl 2-(Benzyloxy) benzoate and Benzene at Different Temperatures

G.H.MALIMATH*, C.V.MARIDEVARMATH and LOHIT NAIK
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Abstract:

The knowledge of acoustical properties of pure liquids and liquid mixtures furnish information on molecular structure, nature and strength of molecular interactions. Hence, a study has been conducted on binary mixtures of Methyl 2- (Benzyloxy) benzoate and Benzene at different temperatures from 298K to 324K using Ultrasonic interferometer (3MHz frequency). The various thermo-acoustical parameters like adiabatic compressibility (β), Intermolecular free length(L_f), Specific acoustic impedance(Z), Molar volume(V_m), Available volume $V_a(s)$, Rao's constant(R_a) and Wada's constant(W) are calculated from the experimentally measured ultrasonic velocity and density. It is observed that, ultrasonic velocity, density, specific acoustic impedance decreases with increase in temperature whereas parameters like adiabatic compressibility, intermolecular free length and molar volume increases with increase in temperature. Hence, results clearly indicate the presence of weak molecular interactions between the components of the mixture. Further, Rao's constant (R_a) and Wada's constant (W) also shows the decreasing trend with increase in temperature and support the presence of weak molecular interactions between the components of the mixture.

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Chapter 3

**Comparative Study of
Phytoplankton Diversity in a
Lentic and Lotic Water Body of
Haliyal Taluk, Uttar Kannada
District, Karnataka State**

Doris M. Singh and S.G. Dinesh Rajan

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ABSTRACT

Haliyal Taluk is located in Uttar Kannada District, Karnataka State. This taluk has numerous water bodies. Comparative Phytoplankton study was made on Sambrani (Lentic) and Bommanahalli (Lotic) water bodies.

In this present study 31 genera belonging to 5 groups of Phytoplanktons were identified in the Sambrani water body and 25 genera belonging to 5 groups of Phytoplanktons were identified in the Bommanahalli water body.

Relative Phytoplankton diversity assessed by Index of Biotal Dispersion was found to be 21.73 per cent for both lentic and lotic water bodies. The status of Organic Pollution based on Palmer's Algal Genus Index for

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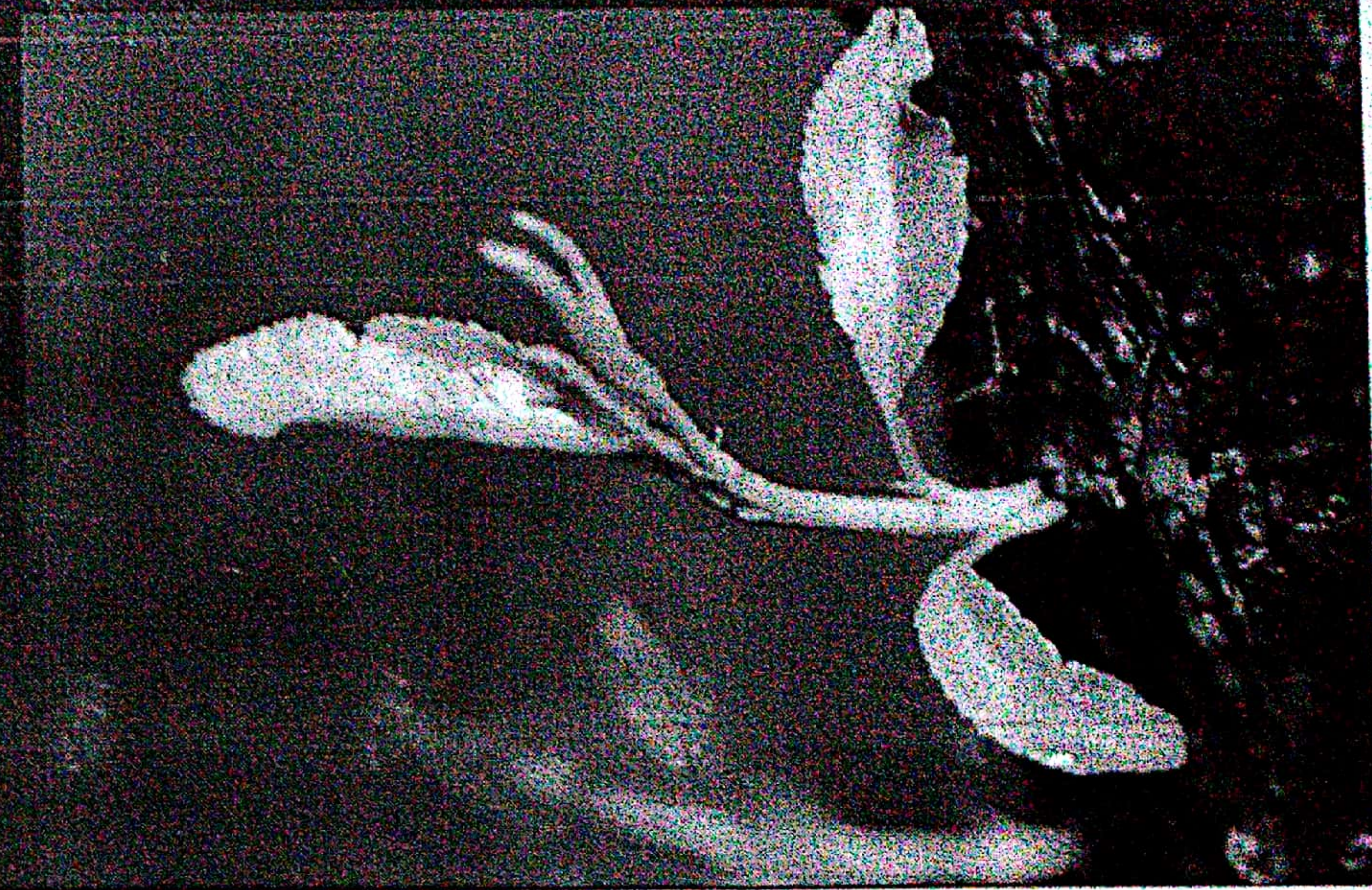
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The Flora of Gadag District, Karnataka, a work based on intensive fieldwork and laboratory studies contains descriptions of 815 species of flowering plants belonging to 518 genera and 113 families. The book has also a number of coloured photographs and line illustrations. Taxonomic key is also been provided for easy identification of family, genus and species. This book will meet the needs of students, teachers, researchers and those interested in the plant biodiversity of Gadag District, Karnataka.

Flora of Gadag District Karnataka

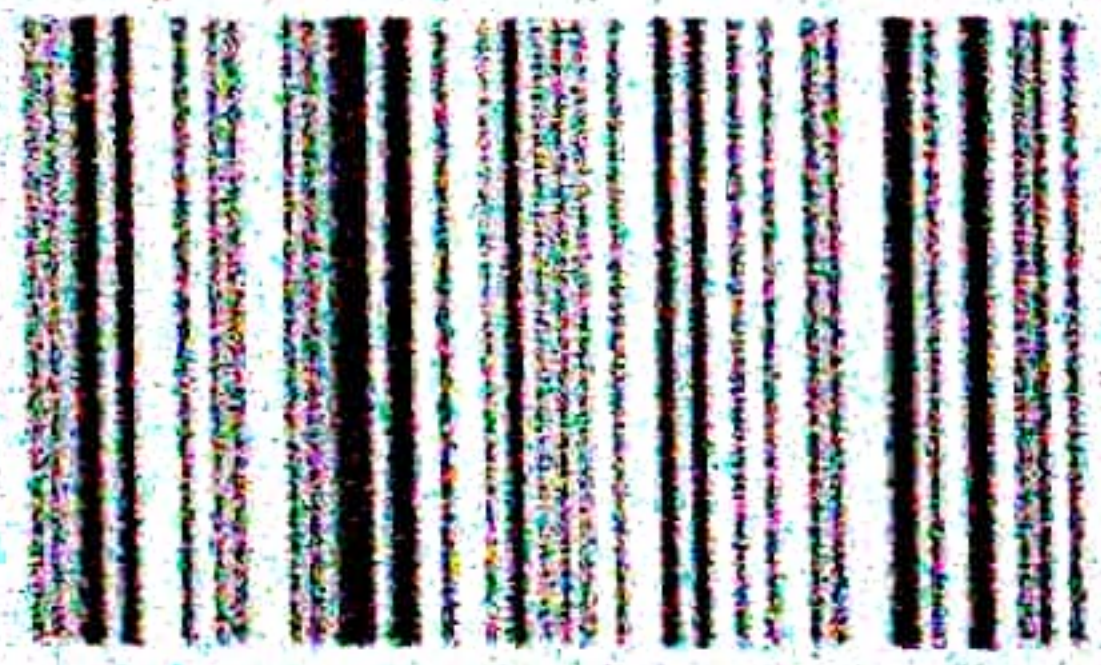


Kotresha Katrahalli
Sidanand Kambhar

Flora of Gadag District Karnataka

Dr. K. Kotresha, Associate Professor, Department of Botany, Karnatak Science College, Dharwad. He has published several research articles/papers in reputed journals. Dr. Sidanand Virthal Kambhar, is presently working as Assistant Professor (Guest) at Department of Botany, Karnataka State Women's University, Vijayapur Karnataka.

Katrahalli, Kambhar

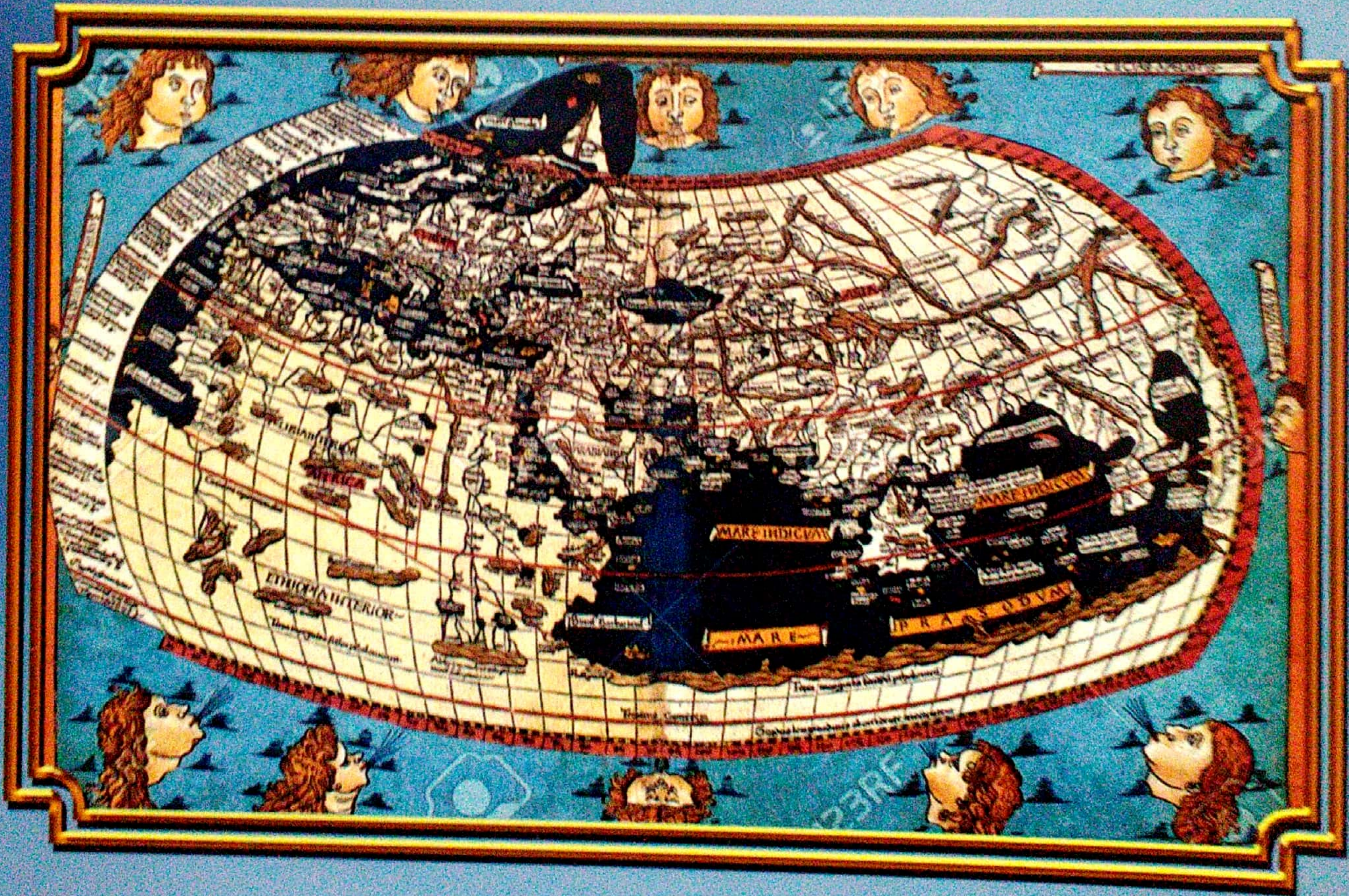


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EVOLUTION OF GEOGRAPHICAL THOUGHT

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ಉಪಯೋಗವಾಗುವಂತೆ ರಚಿಸಲಾಗಿದೆ.)

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**ROLE OF ANIMAL SCIENCES IN NATIONAL
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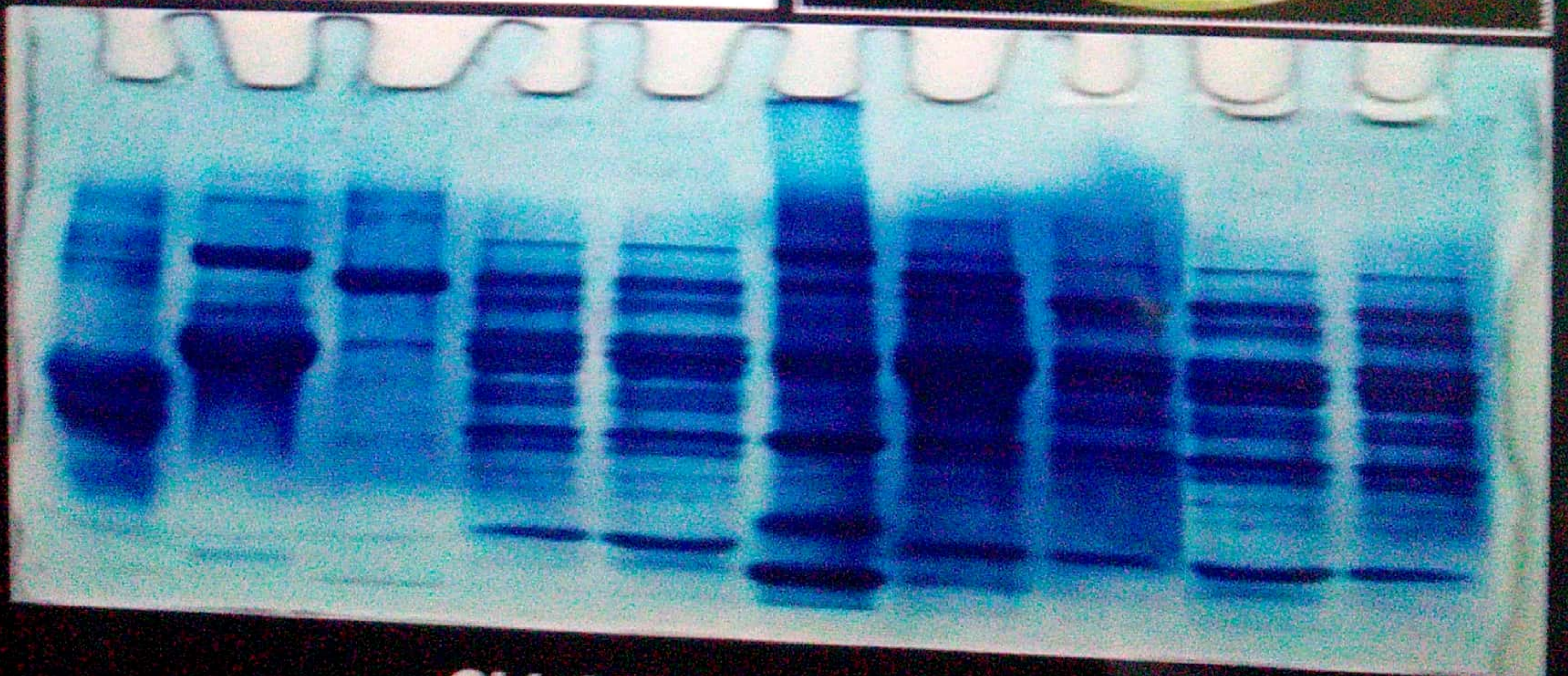
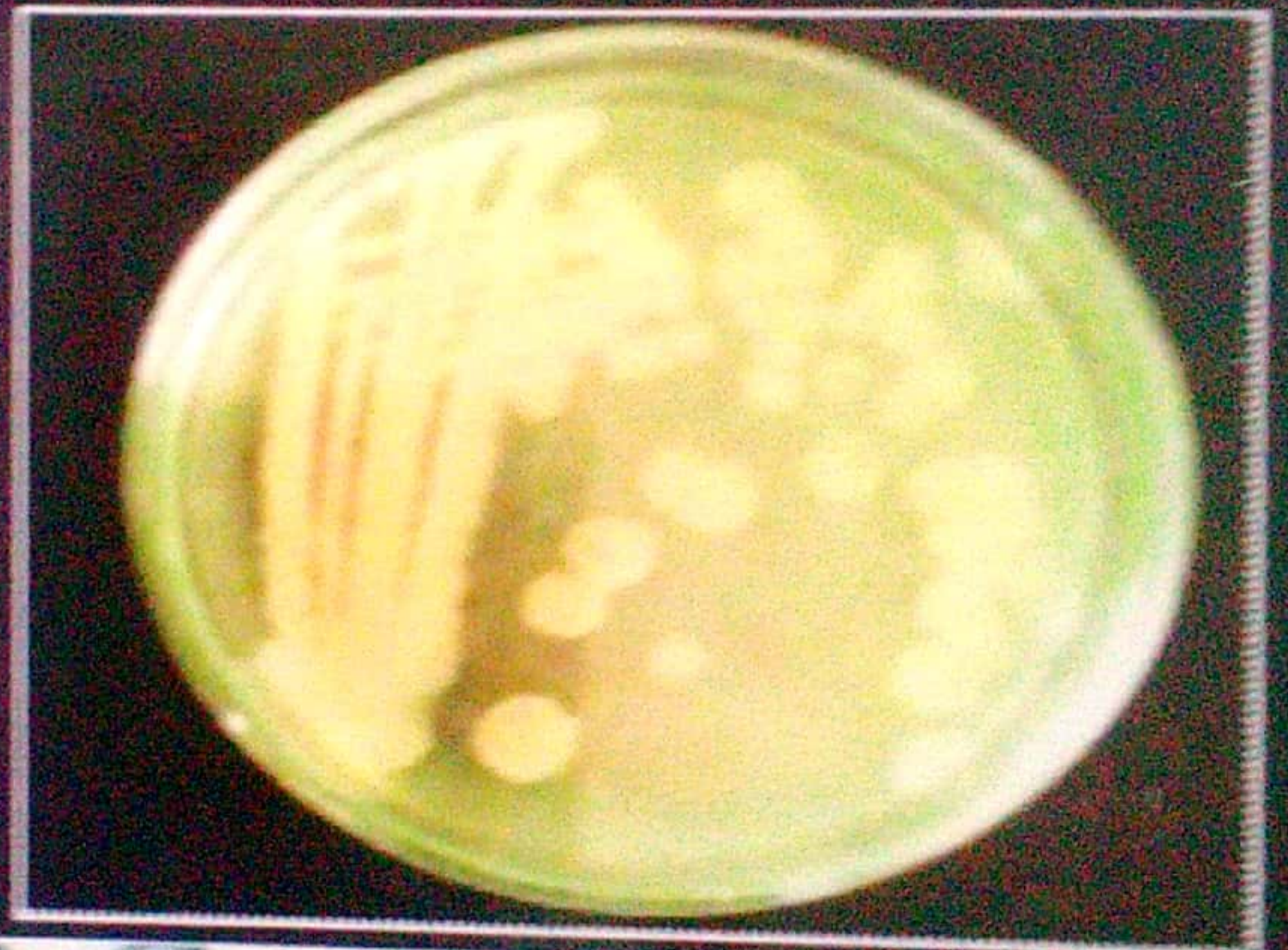


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ABOUT THE AUTHOR

Dr C.F.Mulimani was graduated from Karnatak Sceince College, Dharwad in Criminology Departement. His research bent of mind and assiduous attempt in learning new things made him complete post graduation in criminology and forensic science. By his efforts he completed Ph.D on Bestar the denotified tribe.

As a teacher he has taught various topics prescribed for curriculum and his interest in participating in seminars and conference made him gain the novel and nascent thought and timely changes and researches in the socio-economic as well as the criminological views hence his idea of contributing his opinion and knowledge in the form of book is highly appreciated. He has also contributed books on environment and other social concerns
I wish him all the best

PUBLISHER

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BESTAR TRIBE OF KARNATAKA



By

Dr. C.F. Mulimani

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Karnatak Science College, Dharwad

BASAVA SAHITYA PRAKASHAN HALIYAL

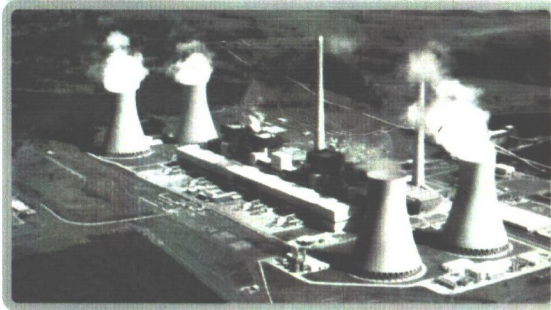
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I wish him all the best

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ENVIRONMENTAL POLLUTION PROBLEMS AND REDRESSAL



By

Dr. C.F. Mulimani

M.A., Ph.D, F.I.S.C

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BASAVA SAHITYA PRAKASHAN HALIYAL

Chapter 10

Micro-organisms as Pollution Indicators in Selected Lentic Habitats of Dharwad, Karnataka State, India

Doris M. Singh

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ABSTRACT

Water quality assessments from different ponds of Dharwad are presented. The results show that the samples have physico-chemical properties well within the permissible limits. But increased turbidity and objectionable microbial load, which indicate water pollution, can serve as an added tool for the rapid evaluation of water quality. Principal component analysis when subjected to the data matrix, revealed the status of water quality in the three selected lentic water bodies.

Introduction

Water is one of the most important natural resource required for all living organisms. Water harbors' micro-organisms from soil, sewage, air, organic matter, dead plants and animals etc. Though the problem of water pollution is worldwide, it is depressing that it draws the attention of scientists only when it becomes hazardous for human health.

In India, studies on the problems of water pollution have geared up earlier but analysis of water quality is being attended to only during the last few decades, when

ABOUT THE AUTHOR

Dr C.F.Mulimani was graduated from Karnatak Science College, Dharwad in Criminology Department. His research bent of mind and assiduous attempt in learning new things made him complete post graduation in criminology and forensic science. By his continuous efforts he completed Ph.D on Bestar the denotified tribe.

As a teacher he has taught various topics prescribed for curriculum and his interest in participating in seminars and conference made him gain the novel and nascent thought and timely changes and researches in the socio-economic as well as the criminological views hence his idea of contributing his opinion and knowledge in the form of book is highly appreciated. He has also contributed books on environment and other social concerns

I wish him all the best

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SOCIO-ECONOMIC LIFE OF BESTAR AND WELFARE MEASURES

By

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BASAVA SAHITYA PRAKASHAN HALIYAL

Chapter 9

Role of Micro-organism in Production of Single Cell Protein

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Introduction

The explosive rate of population growth is the major problem faced by developing nations. In India, the rate of population growth is far greater than food production and supply from all sources available to the population. Conventional agricultural practices may be unable to provide optimum food to the ever-increasing mouths and this results in shortage of proteinaceous food supply. The Food and Agriculture Organization (FAO) predicted a widening of protein gap between developed and developing countries. At least 25 per cent of the world's population currently suffers from hunger, malnutrition and starvation.

The single-cell protein is a preparation containing dried cells which form a protein source for human beings and for cattle. Generally, single-cell proteins are produced from the culture of yeast, bacteria and algae. Germans first used the single-cell protein as food during the First World War. Since then, other countries have been taking considerable interest in the production of single-cell proteins.

New agricultural practices are making efforts to develop high protein cereals. The cultivation of soybeans and ground nuts is ever-expanding, protein may be extracted from liquid wastes by ultra filtration, and the use of micro-organisms as the

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Chapter 9

Phytoremediation: A Quest for Clean and Green Environment

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ABSTRACT

Phytoremediation is an emerging technology that uses various plants to degrade, extract, contain or immobilize contaminants from soil and water. *Pistia stratiotes*, an aquatic plant has been tested for phytoremediation of domestic waste water. *Azolla rubra* is a free-floating water fern, which has been used for several decades as a green manure in rice fields owing to the nitrogen fixing ability of *Cyanobacterium*, *Anabaena azollae*. Arbuscular mycorrhizal fungi (AMF) belong to the wide spectrum of soil microbiota and are able to improve the growth of the host plant, particularly in soils of low nutritional status. AMF increases tolerance to extreme drought conditions, high soil salinity and heavy metal toxicity. The mycorrhizal plants have particularly advantage over non-mycorrhizal plants because mycorrhizal plants survive soils with deficiency of phosphorous. Research in genetic engineering techniques to implant more efficient accumulator gene in plants is being carried out. For example- seedlings of *Brassica juncea* introduced with *E-coli-gsh1*-gene showed increased tolerance to cadmium and had higher concentration of phytochelatins and glutathione as compared to the wild type seedlings. This chapter thus reviews all the phytoremediation techniques being used in the present day and stresses on creating awareness among the human beings towards the phytoremediation and identification of accumulator plant species.

Key words: Pollution, Pesticide, Mycorrhizae, Heavy metals, Salt tolerance, Contaminants

Chapter 15

Trends in Management of Environmental Issues

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ABSTRACT

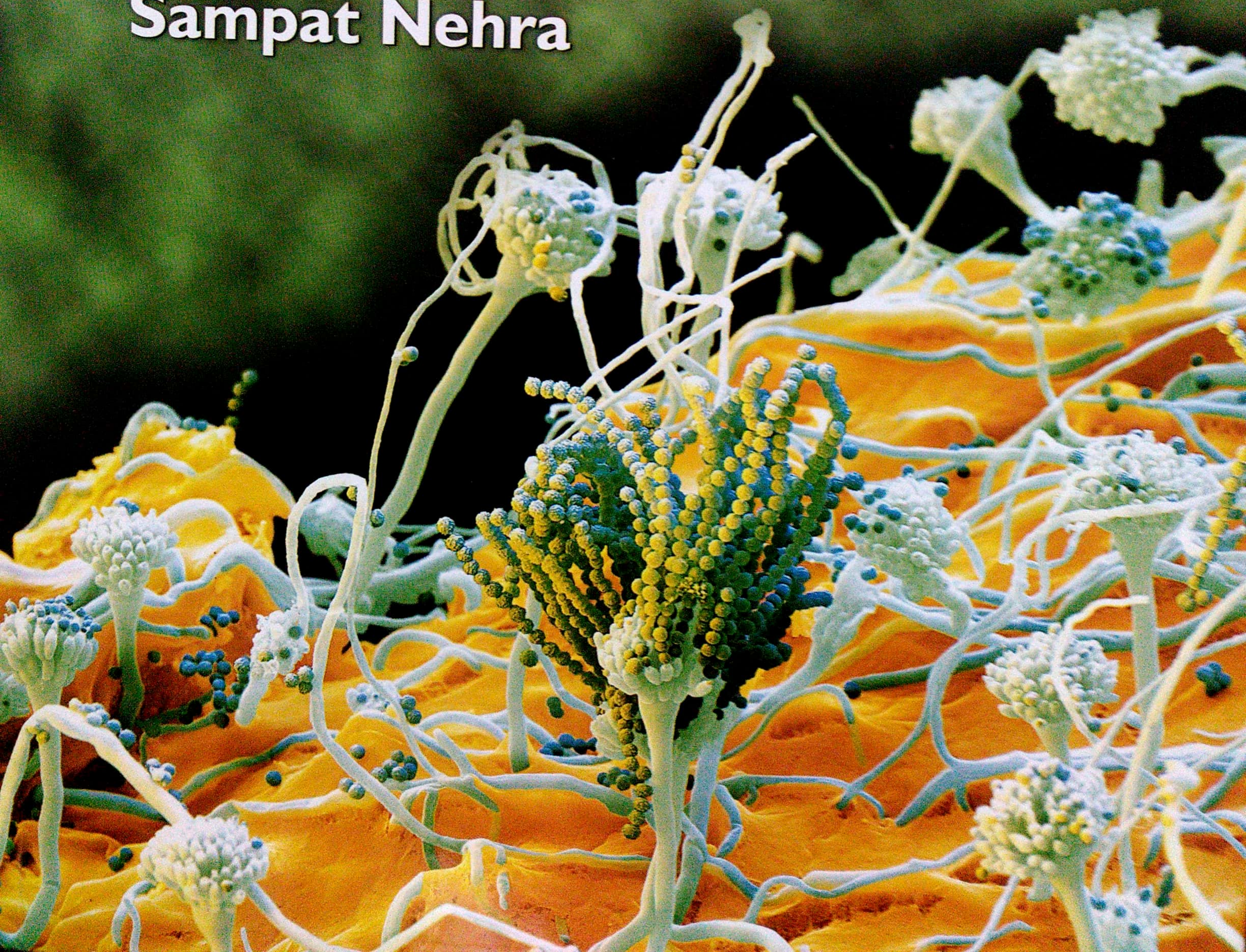
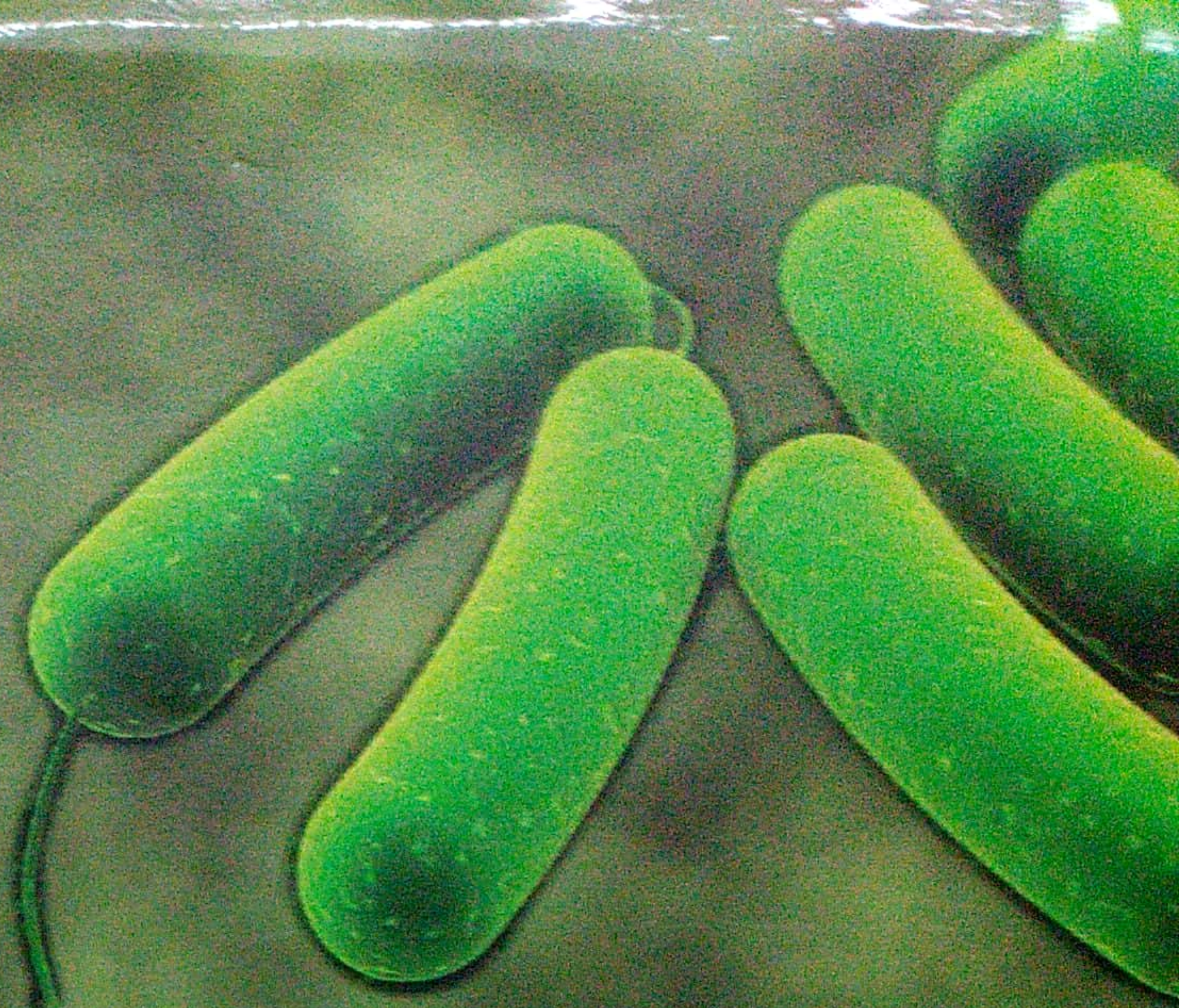
India's rapid growth is causing its rapid environmental destruction. Due to the increasing population pressure, India is pushing itself ahead way too hard with aggressive industrial development, producing enormous amounts of untreated toxic waste, which often end up in our rivers, lakes, forest and landfills.

Unplanned and unmanageable growth of urban areas is causing tragic environmental degradation. Tropical deforestation is responsible in part for the increase in carbon dioxide in the atmosphere. Of all the human induced land degradation problems, the permanent loss of soil productivity due to erosion is worst on the global scale. Accelerated erosion occurs where agriculture is practiced and it is irreversible in nature. Loss of nutrient rich fine soil not only reduces productivity, but also results on silting of water bodies and streams, and induces release of soil carbon from particulate organic material, which contributes global warming. Over fishing is a problem with many marine stocks, physical alterations to coastal habitats increased the susceptibility of coastal populations to flooding and erosion. Sea level will rise as climate change pushes planetary temperatures high. Environmental changes, due to increase of green house gas (GHG) concentration has impacts on agro-forestry ecosystems, biodiversity, regeneration, biomass growth rate and geographic distribution of plant species. Thus this review article of the most highly cited papers in this journal shows significant contributions across five broad themes: the drivers and impacts of systemic and cumulative change, cross cutting concepts such as vulnerability and resilience, approaches to management, control and policy, and different perspectives of climate change.

POINTER |

APPLIED MICROBIOLOGY

Sampat Nehra



SIGNIFICANCE OF MICROBIAL DIVERSITY IN MAINTENANCE OF ECOSYSTEM

K.P. KOLKAR, H.C. LAKSHMAN, T.C. TARANATH
AND A. CHANNABASAVA

INTRODUCTION

Since the dawn of life, some 3-5 billion years ago our planet has giant asteroids, erupted with explosive volcanoes at the rate of mount saint Helen sized blasts per month, accumulated in its atmosphere on the lethal chemicals in the history of life endured three ice ages some of most magnificent species originated, i.e., microbial life existed more than 3.5 billions years ago, 1 billions years after the formation earth, 3 billions years before the plants and animals appeared on earth. According to Wilson (1988), Biodiversity is defined as the variability among living organisms. This includes diversity within species, between species and of ecosystem. International Convention on Biological Diversity (C.B.D) defined microbial diversity as the variability among micro-organisms from all sources including terrestrial, marine and aquatic ecosystem.

Microorganisms constituting the major part of biodiversity on earth are a major source of useful bioactive compounds and therefore emphasize the need for their *in situ* conservation cannot be overemphasized. Because of the uncertainty of long term security of this strategy and the isolation from nature of many microorganisms being problematic, *ex situ* collections alone can ensure conservation of microbial diversity for future investigations and use by man. Micro-organisms are essential part of the environment contributing for the maintenance of stable ecosystem. They are distributed everywhere i.e., soil, water and air. They are present deep inside the earth as well as in deep sea vents. They play important role in recycling biological elements such as oxygen, carbon, nitrogen, sulphur and phosphorous known as biogeochemical cycles. For example 70% of cells weight and /or 24% oxygen is present in atmosphere which is available to all the microbes. About 78% of nitrogen (N₂) is present in atmosphere while 9-15% of cells dry



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FLORISTIC WORK OF PROF. A. R. BRAGANZA IN KARNATAKA AND MAHARASHTRA STATES, INDIA

K. Kotresha, Sidanaud V. Kaumbhar and Nagabhushan S. Harihar

Abstract

The collections of Herbarium of Forest Botanist, Bombay State, Dharwar, (HFBBSD) work was carried out during 1950^s and 1960^s of Prof. A. R. Braganza. He served as Professor of Plant Science in Agricultural as well as Karnatak College in Dharwad, Karnataka. In this period he has been traveled Western Ghats of North Karnataka extensively and part of Southern Maharashtra. Out of his collections, he has donated more than 300 herbarium specimens to Karnatak College, Dharwad. During digitization and rearrangement of Herbaria, many of them were spoiled in his collections and only 162 herbaria were found. They are good in condition and perfect identification, poisoning, pasting and labeling. Even though they are more than 60 years old, they look like a fresh herbarium of one or two years old. The list comprises about 54 families, 127 genera and 162 species are from different locations. These herbariums were scanned and arranged according to the family, genera and species.

Key words: A. R. Braganza, Herbarium, Karnataka, Maharashtra.

Introduction

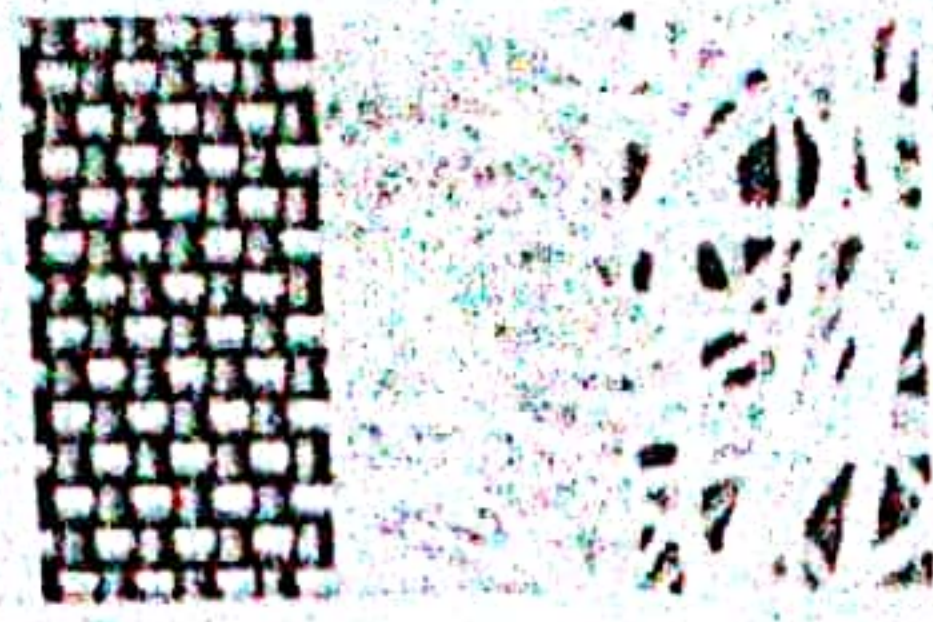
The science of taxonomy provides basic information regarding identification, close relatives, classification, etc. of collected plants (Sivarajan, 1991). The botanical survey involves collection of plants, detailed taxonomical studies, preparation of herbarium specimens for records and further studies (Jasrai *et al.*, 2000). A herbarium is the store house of collection of pressed and dried specimens are arranged in the sequence of an accepted classification for further scientific study (Naik, 1992). Herbarium specimen is accompanied by field note or field records such as those of the places of collections, habitat, colour of the flowers etc. and it is valued as good as original living plant (Venu, 2002).

Datar and Ghate (2009) described the need for online herbarium in India. Digitalization of herbaria is being initiated in India by Agarkar Herbarium (AHMA), Sasyabharthi, Sampada etc. (Rawat, 2009). Digitilization of herbaria certainly has many limitations and delimitations that have already been reviewed by several workers (Sanjappa *et al.*, 2005; Jain, 2008). The present paper is dealing with the herbarium specimens of Prof. A. R. Braganza, Forest Botanist, which were digitized and arranged according to the family, genera and species.

Material and Methods

During 1950 and 1960, plant exploration was carried out by Prof. A. R. Braganza in the Western Ghat of North Karnataka and in few places in Maharashtra. The places are Anshi Ghat, Bank of stream of Gondalli Kan, Bundel Ghat, Dandeli, Dasnalli, Kadra, Devimane Ghat, Dharwar, Gangawati bank (Hosakambi), Gersappe, Gersappe (deciduous), Gersappe (Galmaya evergreen), Gunji (Londa), Hosakambi (kondalli kan), Hosakambi kan, Jog, Kadra, Kadra (Anshi ghat), Karwar, Karwar (Mangrove), Khandala, Khandala (Valley), Kondalli village (Hosakambi), Kulgi, Kunt Kuni Kan, Londa, Londa (Banks of Pandri nadi), Mahabaleshwar, Malemane, Matheran, Mavingundi, Mundurli, Murdi kan (kadra), Ragi hosalli, Salgeri (Kalinadi bank), Sirsi, Sirsi (Ekkambi), Sulgeri (Kali nadi bank), Tukkad bail, Virjekan (Kadra), Yellapur, Yellapur (Sahasrallinga kan), Yellapur (Sahasrahalli), Yellapur (Telgeri) and Yellapur (Tukkad bail kan) from where plant specimens were collected by him.

Identification of these specimens was cross checked and nomenclature is updated with relevant floras of adjacent areas (Hooker, 1872-97; Cooke, 1903-08; Talbot, 1909 and 1911; Saldanha, 1984 and 1996; Sharma *et al.* 1984. All these herbarium were scanned (Jasrai *et al.*, 2000) and arranged according to the names of family and species, with the alphabetical sequence of generic names, followed by place of collection, date of collections, collector number, HFBBSD/HKCD no.



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Thermal Degradation of Ternary Blend Films Containing PVA/Chitosan/Vanillin

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Abstract: The ternary chitosan/poly (vinyl alcohol)/vanillin blend films were prepared by solution casting method. The influence of equal weight percent of poly (vinyl alcohol) and vanillin on thermal stability of the chitosan blend films were investigated by using thermogravimetric analysis (TGA). The kinetic parameters such as enthalpy (ΔH^*), entropy (ΔS^*), and Gibbs free energy (ΔG^*) in the first and second decomposition steps based on the thermogravimetric data were calculated. The thermal stabilities of the blend films were confirmed by thermodynamic parameters obtained in the activation energies, which indicated that increase in the equal weight percent of PVA/vanillin decreased the thermal stability of the chitosan film.

Key words: Chitosan, PVA, vanillin and thermogravimetry.

INTRODUCTION

Nowadays, thermal degradation studies of biopolymer blend films became a subject of interest. Study of the thermal behavior of polymer blend films at different temperature provides insight information about the nature of degradation at various temperatures. Degradation of biopolymer includes all changes associated with the chemical structure and physical properties due to external chemical or physical stress. The aim of the present study is to reveal the amount of information about thermal decomposition blend films and to estimate the kinetic parameters such as activation energy (E_a), enthalpy (ΔH), entropy (ΔS), and Gibbs free energy (ΔG°). These parameters can be used to give a better understanding of the thermal properties of the polymer blend films.

EXPERIMENT

Preparation of blend films

The equal weight percent of poly (vinyl alcohol)/vanillin (PVA/Vn) doped chitosan films were prepared by solvent casting technique. Different weight ratios of individual CH, PVA and Vn solution were prepared in a respective solvent (chitosan in 1 % acetic acid, PVA, and Vn in distilled water). After complete dissolution, all solution were mixed and stirred overnight to get clear homogeneous and viscous solution. Further, the mixture was poured into Petri dishes and allowed to evaporate the solvent at room temperature. Then dry films were peeled off and stored in the desiccators until use.

Dry zone plant diversity and its management

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Introduction

The state of Karnataka covers an area of over 1,92,000 sq. Km., and several of its mountainous regions are covered with dense forests. The dry-zone in Karnataka is distinct in many respects. It is mainly an inland plateau of varying height covering a large area of 92,353 sq. Km. This zone embraces sixteen drier, 'maidan' districts viz. Bagalkot, Bangalore (Rural), Bellary, Bidar, Bijapur, Chitradurga, Davenageri, Gadag, Gulbarga, Haveri, Kolar, Koppal, Mandya, Raichur, and Tumkur. These districts lie between 12° 45' - 18° 25' N latitude and 74° 59' - 78° 35' E longitude. The total forest area in this region accounts to only 7 % of the total geographical area. The pioneering work of Sir J.D. Hooker and his associates (1872-87) on dry zone is very limited. Who published the only available, monumental and exhaustive work on the Flora of India, wherein Bellary and Kolar districts are occasionally mentioned. This was followed by the publication of a number of provincial/regional floras, as wished by Sir Hooker in the valedictory preface of his last volume. With reference to the present area, mention may be made of the Flora of the Bombay Presidency by T. Cooke (1901-08) wherein only Bijapur district is cited and of the flora of the Presidency of Madras by J.G. Gamble (parts 8.1 L by C.E.C. Fischer) (1915-36) which deals with the southern districts of Bellary and Kolar, M.S.Khan's (1953) Forest Flora of Hyderabad State deals with the woody species covering in, general the northern districts of Bidar, Gulbarga and Raichur with out any, particular reference to them. Buchanan Hamilton (1807), seems to be the pioneer "who collected in the present area in the district of Kolar, Tumkur and Chitradurga on his journey from Madras through the Countries of Mysore, Canara and Malabar during 1800-1801. Unfortunately these collections were greatly damaged during transportations to Calcutta. However, the salvaged, specimens were somehow handed over, to James Edward Smith, Who made scanty use of some of these specimens in his volumes of Exotic Botany. Of the United Brotherhood established by Koenig at Trangebar, Heyne (1814) seems to have collected in the southern districts, which were described, by Roth (1821) in his *Novae Plantarum Species* but no definite localities are indicated there. Wight collected about 2000 specimens when he was posted at Bellary in 1833, which are very often mentioned by Sir Hooker and Gamble (*l.c.*) in their floras. Subsequently there was a complete lull in the collections activities in the present area till the end of the nineteenth century and the beginning of the twentieth century, when Cooke, Woodrow and Talbot collected in Bijapur district. Many of which find a place in Cooke's (*l.c.*) flora and are deposited at BSI. Around the first decade of the present century many workers from Pune went, and collected in Bijapur district. These included Bhide, Bhiwa, Paranjapye and Patwardhan besides Kanitkar, Shevade and Vaidya and their collections are also deposited at BSI. Almost simultaneously, Meebold (1909) published a tour report describing in general terms the vegetation in some eastern areas of the state. A few of his collections are also deposited at BSI. Singh *et al.* (1988) have called this land as "land of Tamarind, Temples, Thorns and stones (huge rocks and boulders included)". This work deals with 1421 species belonging to 696 genera and 140 families of which 156 species are cultigens. The forests in these districts are very much scattered all over and are located in small pockets; the forests themselves being very open and stunted, are known to possess great variety in terms of plant and animal species. The distinctness of the vegetation, being categorized as scrub, itself demands for a special status for conservation. The hardiness of various species to withstand the vagaries of nature in the form of extreme heat and drought conditions renders the bio-diversity in area a speciality and calls for a concerted efforts to inventories, assess the extent and preserve/conservate the components, for the benefit of future generations.

This area was inhabited since ancient days and was a battlefield between various groups, dynasties and rulers for a considerable period. The people drew their essentials for existence from the forests in the past and continue to draw them to a considerable extent even

ANALYSIS OF CHARACTER VARIATION AND DATA PRESENTATION IN
SOME SPECIES OF *BAUHINIA* L., *CASSIA* L., *CAESALPINIA* L.,
HARDWICKIA ROXB. AND *MOULLAVA* ADAN. (CAESALPINIACEAE)

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*Department of Botany, Gulbarga University, Gulbarga, Karnataka

Abstract

The present study on 12 species of *Bauhinia*, 19 species of *Cassia*, five species of *Caesalpinia*, one of *Hardwickia* and one of *Moullava*. These specimens were collected from various parts of Karnataka and other states. The collected specimens were identified with the help of Flora, monographs and Pictorial Cyclopaedia of Cultivated Plants.

For character analysis 12 multistate quantitative and 8 multistage qualitative characters were considered to draw the polygraph of the genera under study. The polygraph are plotted separately, following the method of Hutchinson (1936) and Davidson (1947). These polygraphs shows an affinity among the taxa at glance. The details of the character, character states and index values are tabulated in the table. Auderson's metroglyph analysis method was used to study the interspecific and intergeneric variability among taxa. The epidermal cell size on both adaxial and abaxial surfaces were considered for metroglyph. About 50 cells of each surfaces were observed and mean values were considered for plotting. The details of the character are given in the table. The close affinity between *Bauhinia* and *Hardwickia*, similarly *Caesalpinia* and *Moullava* has been noticed in our study.

Introduction

It is generally accepted today that the geographical and ecological radiation of populations is in many instances paralleled by morphological (physical, biochemical etc.) differentiation. Backed by extrinsic (environmental) and/or intrinsic (biological) isolation this allopatric type of differentiation becomes an important aspect of speciation, and also of the space-time bound processes of evolution (Wagner 1868).

All evolutionary processes are regarded as hereditary changes in populations brought about by mutation and recombination, sifted by selection, and channeled by isolation and random events. These basic phenomena are closely related to size, position, migration, variation and reproduction of populations and their environment.

In phenetic population analysis all characters should be considered; formulae, indices, histograms, polygons, and particularly pictorialized scatter diagrams are well known methods to bring out diversity and combination of characters within, and distinctness between species. Special mention should be made of the remarkable taximetric computer analysis of 196 individual phenotypes in South American groups of *Cassia* L. (Irwin and Rogers 1967).

Materials and Methods

Materials for the present investigation were collected from different parts of South India, Lucknow and Pune. The collected plant species were identified with the help of flora and monographs. (Baker, 1879. Cooke, 1903; de Wit, 1956; Gamble, 1935 and Saldanha, 1984). The cultivated species were also identified with the help of Pictorial Cyclopaedia of Exotic Plants (Graf, 1980) and Manual of Cultivated Plants (Bailey, 1971). For each collection, voucher number was given. Field notes were prepared with all the collections. Herbarium sheets were prepared with usual procedure by selecting healthy twigs for each collection. All the specimens are deposited in the Herbarium of Gulbarga University, Gulbarga (HGUG). The details about the place of collection, voucher number of the specimen and others are tabulated (Table - 1)

Polygraph

In the present study we have considered 12 multistate quantitative characters, 8 multistate qualitative character to draw the polygraphs of the genera under study. The details of character, character states and the index values are tabulated in Table-2 and 3.

1. Studies on phyto-diversity, alien species and their status in Dharwad District, Karnataka, India

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ABSTRACT

In this study we present an account of Phytodiversity and alien species in the Dharwad District in India with additional information on habit, origin, longevity, habitat and uses since 1998. During this investigation; a total of 1322 plant species belonging to 793 genera and 151 families were identified. Out of these 306 alien species belonging to 227 genera in 71 families were identified and listed from various localities in the District. Among the total number of the alien species 59% are native to Tropical America. Analysis of the habit shows that 167 alien species are herbs, followed by 63 trees, 47 shrubs and 30 climbers. Among the 71 families, Fabaceae is found to be the most dominantly invasive family with 33 species. There is an urgent need to list regional data on (invasive) alien species diversity in order to study their impact on native vegetation and explore the worldwide pattern of species invasion.

KEY WORDS: Alien species, Dharwad, invasive species, phytodiversity

INTRODUCTION

Organisms migrating to new localities and their descendants have been referred to as alien, adventive, exotic, introduced and non-indigenous (Sharma *et al.*, 2005). Biological invasions by alien species are globally recognized as a significant component of human induced environmental changes, often resulting in a significant loss in the economic value of crops, forests, fisheries, grazing capacity of domesticated animals (Mack *et al.*, 2000; Lambdon *et al.*, 2008), causing serious environmental threats to native ecosystems (Abella *et al.*, 2009), conservation of biodiversity (Rejmanek *et al.*, 2005; Foxcroft *et al.*, 2008) and also to society including human health (Wu *et al.*, 2010a). Invasive alien species annually cause billions of dollars damage across a wide range of sectors including agriculture, forestry, fishery, ecosystem services, and overall environment (Goyal, 2005). Invasive exotic plants are implicated in the decline of threatened and endangered species, because they alter the ecosystem processes, change vegetation structures and displace native species, often because they reach high densities and biomass (Denslow, 2007).

Biological invasions are represented by alien species introduced accidentally or purposefully outside their native geographical distribution ranges, for example, within 200 years of introduction to India, the invasive weed *Parthenium hysterophorus* L. invaded 14.25 million hectares of farm land. Similarly, *Prosopis juliflora* (Sw.) DC. invaded 1.8% of the total land area of India (Love *et al.*, 2009). *Parthenium hysterophorus* has been reported to exert effective allelopathic interference in the surrounding flora (Kanchan and Jayachandra 1980; Hierro and Callaway, 2003), also to be a health hazard, particularly to farm labourers. Frequent contact with this plant causes allergy, dermatitis, eczema, asthma, and gangrene (Bahar, 2000), and also constant sneezing, cough, and fever (Dasgupta, 2010). Another

9. Abutilon bidentatum var. *major* (Blatt. & Hallb.)
Bhandari: A New Record for Southern Peninsular India

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ABSTRACT

Abutilon bidentatum var. *major* (Blatt. & Hallb.) Bhandari is recorded from Karnataka state for the first time and is also a new record for Southern Peninsular India. The detailed description and illustrations are provided.

Key words: Malvaceae, New record, Dharwad, Karnataka State

INTRODUCTION

The genus *Abutilon* Miller is one of the larger genera of Family Malvaceae (Fryxell 1987, 2002). In India, it is represented by 13 species (Paul & Nayar 1988 ; Paul 1993). Saichama and Ramesh (1984) have recorded seven species from Karnataka State, but not *Abutilon bidentatum* var. *major*. The monographic work by Sivarajan and Pradeep (1996) also indicates, that this species has not been recorded from Southern Peninsular India. Further, the subsequent floristic studies on the district Floras of Karnataka State viz: Coorg (Keshavmurthy & Yoganarasimhan 1990), Gulbarga (Seetharam *et al.*, 2000), Shimoga (Ramaswamy *et al.*, 2001), Udipi (Bhat 2003) and Davangere (Manjunatha *et al.*, 2004) too have not recorded this species. In view of these facts, we report *Abutilon bidentatum* var. *major* (Blatt. & Hallb.) Bhandari collected by the authors from Dharwad, Dharwad District as a new record for both Karnataka State and Southern Peninsular India. The species is described in detail and illustrated appropriately.

Abutilon bidentatum var. *major* (Blatt. & Hallb.) Bhandari, Fl. Indian Des. 60, 1978, Paul & Nayar in Nayar *et al.* (eds.), Fasc. Fl. India 19: 83, 1988, Paul in Sharma & Sanjappa (eds.), Fl. India 3:263, 1993.

Fig.1



Fig 1: *Abutilon bidentatum* var. *major* (Blatt. & Hallb.) Bhandari
A. Habit Sketch. B. Calyx.
C. Petal. D. Androecium
E. Gynoecium. F. Fruit. G. Mericarp

FOLIAR STUDIES IN SOME SPECIES OF *SIDA* L. (MALVACEAE)

Sharada B. Kunnur and K. Kotesha

Abstract

The present study is on eight species of *Sida* L. (Malvaceae) viz., *Sida acuta* Burm. f., *S. alnifolia* L., *S. cordata* (Hornem.) Bors., *S. elongata* Bl., *S. mysorensis* W. & Arn., *S. rhombifolia* L., *S. rhomboides* Roxb. and *S. spinosa* L. from Karnataka state. These were studied in respect to venation pattern and were incorporated for preparing a key. The major venation pattern is camptylodromous in six species and astromerodromous in two species. The highest degree of venation order resolved is up to fourth (4th) degree. The lamina shape, base, apex, margin, number of primary (1st) veins, secondary (2nd) veins and the venation patterns all vary from species to species. An indented key is provided for the identification of *Sida* L. species.

Keywords: Foliar venation, *Sida*, Malvaceae

Introduction

There are about 200 species of *Sida* L. (Willis, 1973) widely distributed along the tropical and subtropical parts of the world. Among the 17 species (Sivarajan and Pradeep, 1996) represented in India 8 species are collected from Karnataka for the present work. Leaves are generally neglected organs in taxonomic and comparative morphological studies. Recent studies on leaf architecture of dicotyledons Hickey (1975, 1979) had created much interests and put forwarded several investigations in this field as taxonomic importance. In these it had been considered the shape, base, apex and marginal teeth of the lamina and had also given terminology for the venation patterns. A comparative study of leaf architecture throughout the angiosperms had been done and six different classes of major venation patterns are recognized by Melville (1976). Many investigators (Goster, 1950, 1951, 1952; Datta and Saha, 1968; Chandra *et al.*, 1972; Mohan and Inaradhar, 1982, 1984; Seshnaram and Kotesha, 1998) had concluded that the studies on foliar venation provide useful taxonomic clues for the identification of different taxa.

Sida L. is one of the very variable and widely distributed genera of the family Malvaceae (Hegnathiglu, 1983). As a genus *Sida* L. is easily distinguished from other genera by the lack of involucre, calyx morphology (10-costate) and uniovulate mericarps. However, it is a taxonomically difficult group as far as infragenetic classification is considered (Ugbongho, 1980). Several authors have attempted subgeneric classification of the genus. Out of 11 sections recognised by Fryxell (1973), six are represented in India. In the present study, the authors have collected eight species from Karnataka and includes *S. acuta* Burm. f. (Spiny-head *Sida*), *S. alnifolia* L., *S. cordata* (Hornem.) Bors., (Long-stalk *Sida*), *S. elongata* Bl., *S. mysorensis* W. & Arn., *S. rhombifolia* L. (Common *Sida*), *S. rhomboides* Roxb. and *S. spinosa* L. (Prickly *Sida*). The eight species fall under three sections namely section *Sidae* (*S. acuta*, *S. alnifolia*, *S. rhombifolia*, *S. rhomboides*), section *Nelavagae* Bors. (*S. cordata*, *S. elongata*, *S. mysorensis*) and section *Spinosae* Small (*S. spinosa*).

Indian *Sida* L. have been identified on the basis of mericarp morphology (Sivarajan *et al.*, 1992). However, classification becomes uncertain when mericarps are damaged or lose their carpal-wall. Therefore, an attempt is made in this study to identify them on the basis of macro-morphological characters, specially the foliar venation pattern.

Materials and Methods

The eight species of *Sida* L. were collected from Karnataka state (Table 1; Fig. 1). All species are heliophilous and wild in habitat. They were identified with the help of relevant books (Hansen, 1972; Greuter, 1991; Gamble, 1935; Rao and Razi, 1981; Yoganarasimhan *et al.*, 1982; Sankaran, 1989; Sharma *et al.*, 1984; Keshavamurthy & Yoganarasimhan, 1991; Paul, 1993; Seshnaram *et al.*, 2000; Karmaswamy *et al.*, 2001; Hiral, 2003; Mangamath *et al.*, 2004) and monographs (Sivarajan and Pradeep, 1996). All the collected species were deposited in herbarium



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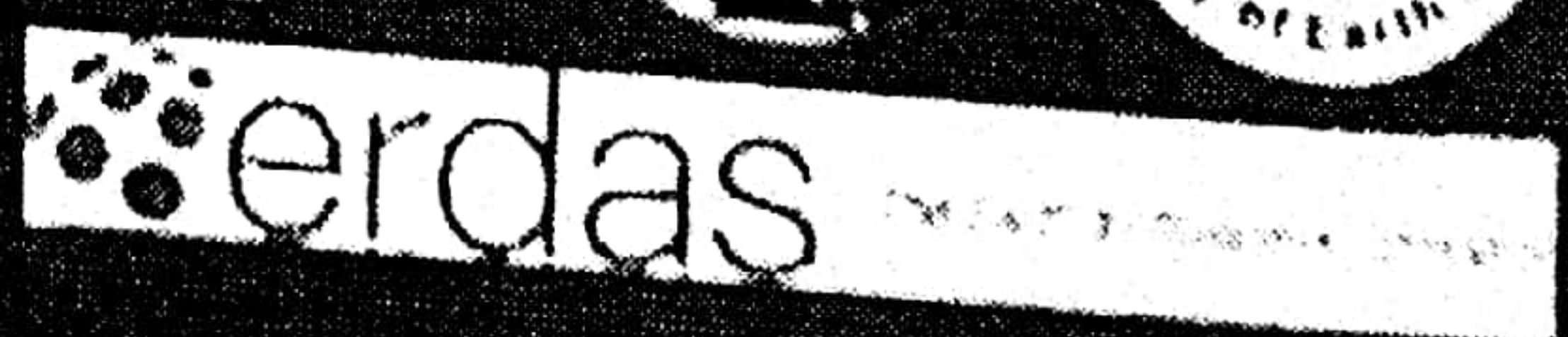


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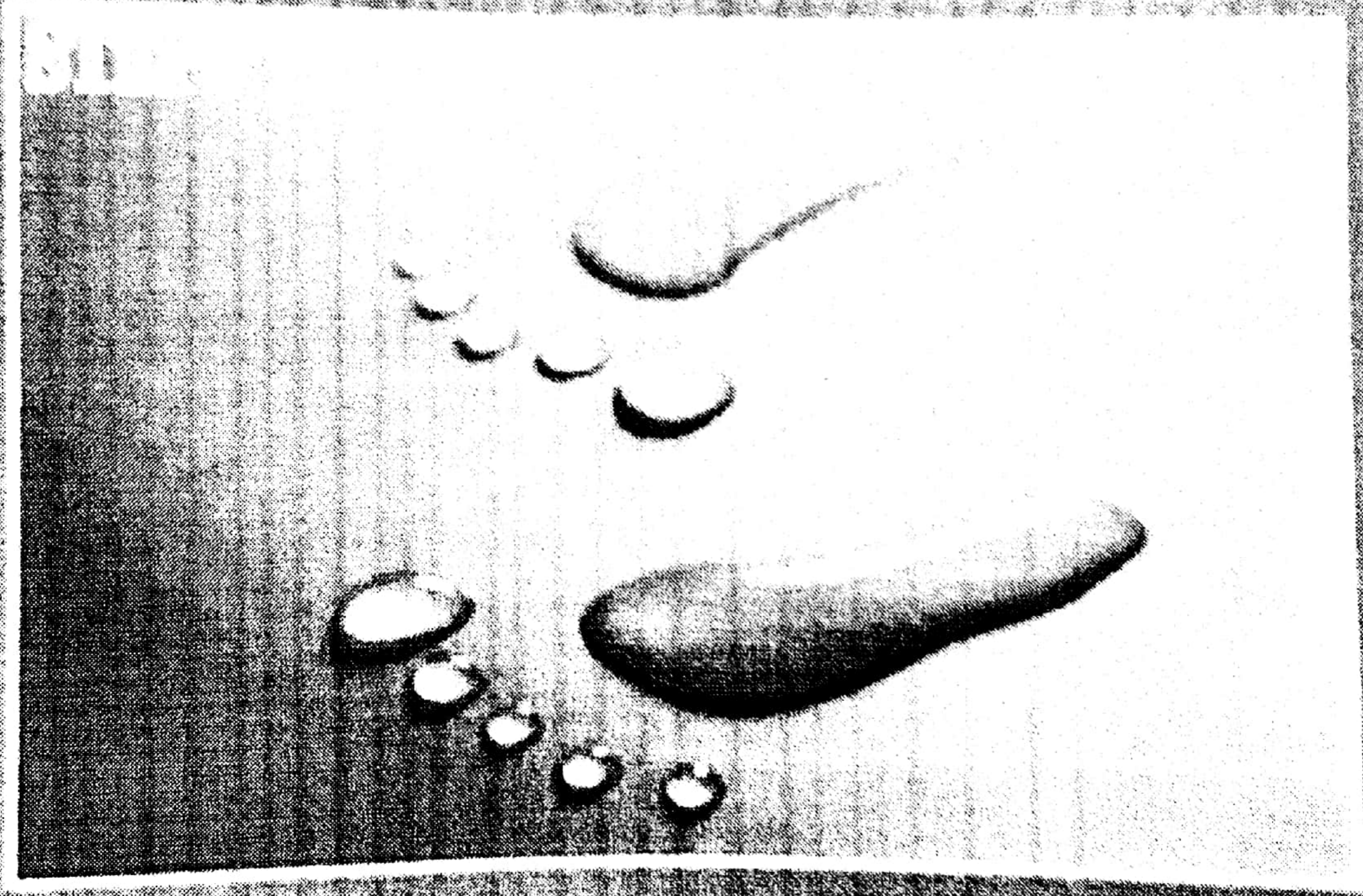


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