



TEXT BOOK OF PRACTICAL BOTANY - II

Ron Kemprai
Dr Ajit Kr. Tamuli
Dr. Robindra Teron

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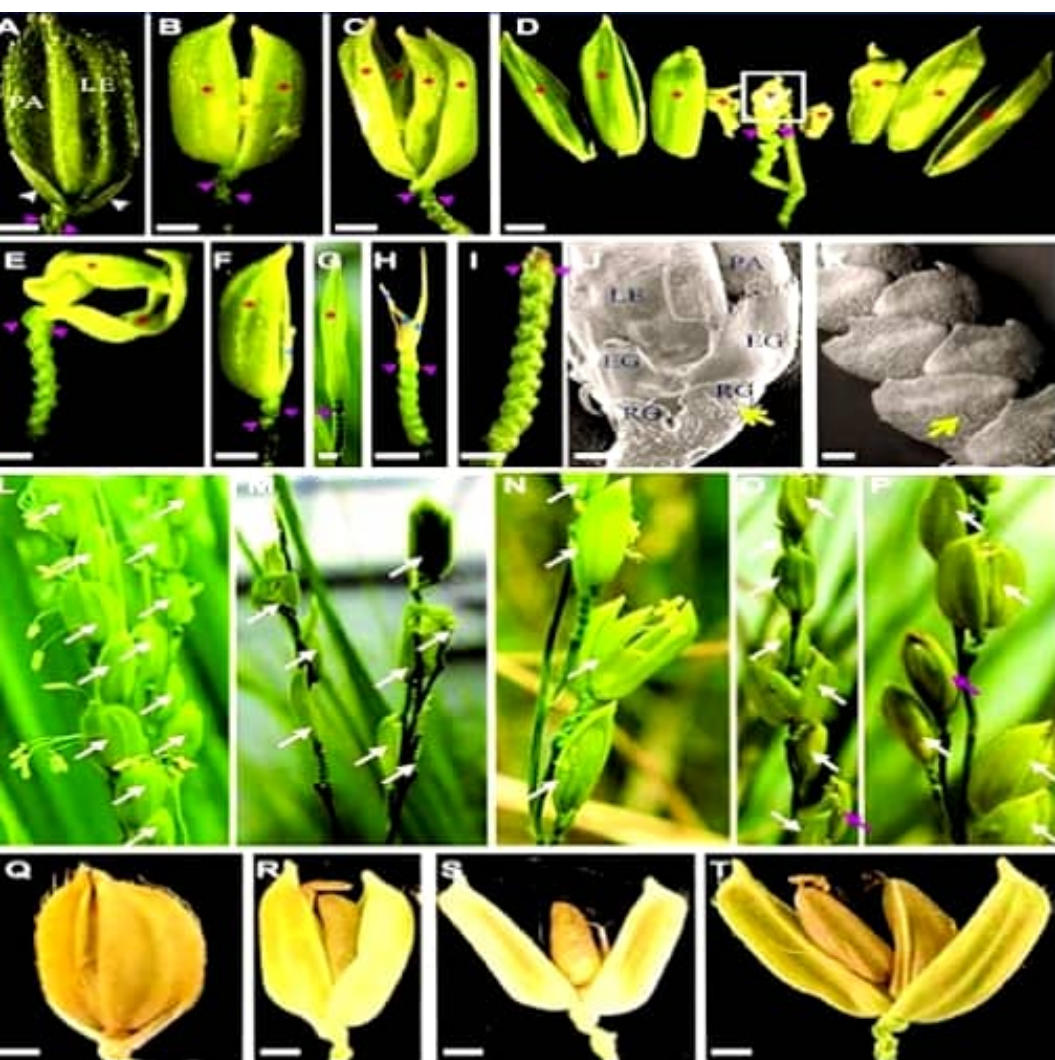
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23.1.1	Identification of Fungi: <i>Plasmodiophora</i> , <i>Phytophthora</i> , <i>Albugo</i> , <i>Rhizopus</i> , <i>Erysiphae</i> , <i>Aspergillus</i> , <i>Penicillium</i> , <i>Claviceps</i> , <i>Ustilago</i> , <i>Puccinia</i> , <i>Colletotrichum</i> , <i>Cercospora</i> , <i>Alternaria</i>	
23.2	Study of Koch's Postulates for Evaluation of Pathogenicity	
23.3	Isolation of Plant Pathogens and Pure Culture Preparation	
23.3.1	Preparation of some Culture Media for Fungi	
23.3.2	Pouring the Media for culture	
23.3.3	Inoculation of Fungi	
23.3.4	Isolation of Pure Culture	
23.4	Evaluation of Disease Index and Crop loss	
23.5	Glossary	
23.6	Viva- voce	
23.7	References	
Unit -24	Biochemical and Microbiological study of Pathology	506-511
24.0	Objectives	
24.1	Estimation of Culture Filtrates of Fungi: Cellulose, Pectinase, Protease and Amylase	
24.2	Estimation of Protein and Amino-acids	
24.3	Evaluation of Fungicidal Efficacy	
24.4	Viva-Voce	
24.5	References	
Unit -25	Diseased Plant Material	517-5
25.0	Objectives	
25.1	Introduction	
25.2	Collection of Diseased Plant Material	
25.3	Viva-voce	
25.4	References	

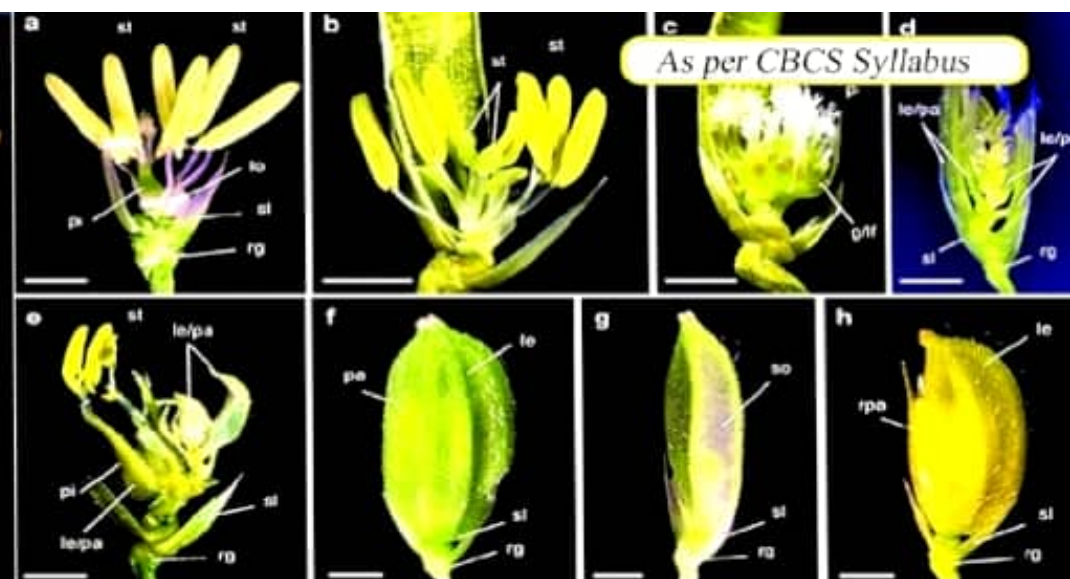


Ron Kemprai
A Complete Practical Manual
of Plant Breeding
Dr. Ajit Kumar Tamuli



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A COMPLETE PRACTICAL MANUAL OF PLANT BREEDING

For B. Sc. 5th Semester of Botany for Honours
 Students of Assam University and Other Indian Universities

PRACTICAL MANUAL PART – I
&
THEORY PART – II

PAPER CODE – DSE-503.

Ron Kemprai
Dr. Ajit Kumar Tamuli



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PRACTICAL MANUAL
PART -I
Content of Laboratory Manual

Lab. No.	Aim of the Experiment	Page No.
1.	Plant Breeder's kit, Study of germplasm of various crops	1 - 10
2.	Study of floral structure of self-pollinated and cross pollinated crops	11 - 16
3.	Emasculation and hybridization techniques in self pollinated crops	17 - 19
4.	Emasculation and hybridization techniques in cross pollinated crops	20
5.	Consequences of inbreeding on genetic structure of resulting populations	21
6.	Study of male sterility system	22 - 24
7.	Handling of segregation populations	25 - 28
8.	Methods of calculating mean, range, variance, standard deviation, heritability	29 - 31
9.	Designs used in plant breeding experiments, analysis of Randomized Block Design	32- 34
10.	To work out the mode of pollination in a given crop and extent of natural out-crossing	35
11.	Prediction of performance of double cross hybrids	36

A Complete Practical Manual of Plant Breeding : (Practical Manual part – I & theory part – II)
A Textbook for B. Sc. 5th Semester of Botany for Honours Students of Assam University and
Other Indian Universities written/compiled by Ron Kemprai, Assistant Professor, Department of
Botany, Haflong Government College, Haflong, and Dr. Ajit Kumar Tamuli, Associate Professor,
Department of Life Sciences and Bioinformatics, Assam University, Diphu Campus, Diphu and
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PREFACE

This Book entitled "A Complete Practical Manual of Plant Breeding" (Practical Manual part – I & theory part – II) has been especially meant for the Students of B. Sc. 5th Semester Botany Honour covering the latest CBCS Syllabi of Botany Practical as well as Theory of the Universities of Assam in particular, and other Indian Universities in general.

This Book includes 11 Part – I Chapters. The basic Contents of the Book include are :- * Plant Breeder's kit, Study of germplasm of various crops * Study of floral structure of self-pollinated and cross pollinated crops * Emasculation and hybridization techniques in self pollinated crops * Consequences of inbreeding on genetic structure of resulting populations * Study of male sterility system * Handling of segregation populations * Methods of calculating mean, range, variance, standard deviation, heritability * Designs used in plant breeding experiments, analysis of Randomized Block Design * To work out the mode of pollination in a given crop and extent of natural out-crossing * Prediction of performance of double cross hybrids *.

This Book includes 15 Part – II Chapters The basic Contents of the Book include are :- * Introduction to Plant Breeding * Achievements of Plant Breeding, Constraints of Plant Breeding, Plant Introduction Purposes/objectives of Plant Introduction * Acclimatization, Evolution, Polyploidy, Germplasm, Center of Origin * Pollination and reproduction in crop plants * Male Sterility, Self Incompatibility (SI), Qualitative and Quantitative Traits * The Multiple Factor Hypothesis, Role of environment in quantitative characters, Biometrical Techniques in Plant Breeding, Selection in self-pollinated Crops * Johannsen's Pureline Theory, Origin of Genetic variation in Purelines * Genetic gain/response to selection * Genetic Composition and Selection in Cross Pollinated Crops * Inbreeding and Heterosis, Breeding Methods in Self Pollinated crops, Single seed descent method, Backcross Selection method * Clonal selection and hybridization, Breeding hybrid cultivars * Mutation and Mutation Breeding, * Polyploidy in Plant breeding, Role of polyploidy in plant breeding, Synthesis of allopolyploids * Breeding for pest resistance, Release of new varieties, Origin *.

The "A Complete Practical Manual of Plant Breeding" (Practical Manual Part – I & Theory Part – II) is entirely written/compiled work and will be most use to the Students and Teachers of Botany. In this book an attempt has been made to collect and compile the information of Practical available in various literatures/research publications as well as websites necessary care has been taken to incorporating data from the said sources. The authors has given more emphasis to present the subject matter of each and every topics covered by the syllabi, in simple, concise and lucid manner to the students.

The authors is very much thankful to the 'ARB Publications, Guwahati' for publishing this book with utmost care and interest. We are thankful to esteemed colleagues of my department for their best wishes, suggestions. We convey our thanks to our beloved Parents and all our loving family members and relatives for their heartiest co-operation and inspiration.

Ron Kemprai, Dr. Ajit Kumar Tamuli

Practical Manual part –II

Content of Theory Part

No.	Aim of the Experiment	Page No.
1.	<i>Introduction to Plant Breeding</i>	39-43
2.	<i>Achievements of Plant Breeding, Constraints of Plant Breeding, Plant Introduction Purposes/objectives of Plant Introduction</i>	44- 47
3.	<i>Acclimatization, Evolution, Polyploidy, Germplasm, Center of Origin</i>	48-55
4.	<i>Pollination and reproduction in crop plants,</i>	56-61
5.	Male Sterility, Self Incompatibility (SI), Qualitative and Quantitative Traits	61-66
6.	<i>The Multiple Factor Hypothesis, Role of environment in quantitative characters, Biometrical Techniques in Plant Breeding, Selection in self-pollinated Crops</i>	67-73
7.	Johannsen's Pureline Theory, Origin of Genetic variation in Purelines	74-76
8.	<i>Genetic gain/response to selection</i>	77-79
9.	Genetic Composition and Selection in Cross Pollinated Crops	80-87
10.	<i>Inbreeding and Heterosis, Breeding Methods in Self Pollinated crops, Single seed descent method, Backcross Selection method</i>	94-109
11.	Breeding methods in cross-pollinated crops, Progeny selection, Half sib selection,	110-118
12.	Clonal selection and hybridization, Breeding hybrid cultivars	119-128
13.	Mutation and Mutation Breeding,	129-134
14.	Polyploidy in Plant breeding, Role of polyploidy in plant breeding, Synthesis of allopolyploids	135-154
15.	Breeding for pest resistance, Release of new varieties, Origin	155-182



As per CBCS Syllabus



A TEXTBOOK OF PRACTICAL BOTANY - 1

ALGAE, FUNGI, LICHENS, MICROBIOLOGY, PLANT
PATHOLOGY, BRYOPHYTA, PTERIDOPHYTA,
GYMNOSPERMS AND PALAEOBOTANY

*For Botany of all Semester for Regular Students of Degree
Colleges, Assam University and other Indian Universities*

Ron Kemprai
Dr. Ajit Kumar Tamuli



A TEXTBOOK OF PRACTICAL BOTANY – 1 : A Textbook for Botany for all Semester for Regular Students of Degree Colleges, Assam University and other Indian Universities written/compiled by Ron Kemprai, Assistant Professor, Department of Botany Haflong Government College, Haflong, and Dr. Ajit Kumar Tamuli, Associate Professor, Department of Life Sciences and Bioinformatics, Assam University, Diphu Campus, Diphu and Published by ARB Publications, House No. 14, Kushal Konwar Path, Last Lane, P.O. Ambari Fatashil, Guwahati -781 025, Dist. Kamrup (M), Assam.

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Contents

1. Introduction

Preamble 1, Laboratory etiquette 1, Work plan 1, Necessary instruments 1, Microscope 1, Other laboratory provisions 4, Fixing agents and preservatives 4, Laboratory techniques 4, Record of work 11, Herbarium 12. **1-15**

2. Algae

Preamble 16, Classification 20, *Chlamydomonas* 21, *Volvox* 22, *Chlorella* 24, *Hydrodictyon* 25, *Cladophora* 26, *Fritschella* 28, *Coleochaete* 29, *Oedogonium* 31, *Zygnema* 34, *Chara* 36, *Vaucheria* 40, Diatoms 43, *Ectocarpus* 45, *Fucus* 47, *Sargassum* 50, *Batrachospermum* 55, *Ceramium* 56, *Polysiphonia* 59, *Oscillatoria* 63, *Nostoc* 64, *Scytonema* 66, *Rivularia* 67, *Gloeotrichia* 68. **16-69**

3. Fungi

Preamble 70, Classification 71, *Plasmodiophora* 74, *Synchytrium* 77, *Saprolegnia* 79, *Achlya* 81, *Phytophthora* 83, *Albugo* 86, *Rhizopus* 89, *Erysiphe* 92, *Sphaerotheca* 95, *Phyllactinia* 97, *Aspergillus* 99, *Penicillium* 102, *Claviceps* 103, *Peziza* 106, *Ascobolus* 107, *Morchella* 109, *Ustilago* 111, *Puccinia* 114, *Agaricus* 120, *Polyporus* 122, *Altemaria* 124, *Cercospora* 126, *Colletotrichum* 128. **70- 130**

4. Lichens

Ascolichens 131, Crustose lichens 131, Foliose lichens 132, Fruticose lichens 134, Basidiolichens 136. **131 - 136**

5. Microbiology

To culture bacteria 137, To isolate micro-organisms from mixed culture and grow a pure culture 139, To stain and study bacteria 140, To measure bacterial cells 140, Microscopic examination of curd 141. **137 - 141**

Contents

6. Plant Pathology **142-166**

Preamble 142, List of diseases 142, Black wart disease 143, Damping off 144, Late blight of potato 145, Green ear disease of bajra 146, Downy mildew of pea 148, White rust of crucifers 149, Powdery mildew of barley 150, Loose smut of wheat 151, Covered smut of barley 152, Whip smut of sugarcane 152, Black stem rust of wheat 153, Brown (orange) rust of wheat 154, Rust of linseed 155, Early blight of potato 156, Tikka disease of groundnuts 157, Wilt of cotton 158, Red rot of sugarcane 159, Bacterial blight of rice 160, Citrus canker 160, Tundu disease of wheat 161, Leaf curl of potato 162, Tobacco mosaic 162, Leaf curl of tobacco 163, Leaf curl of papaya 163, Yellow vein mosaic of bhindi 164, Little leaf of brinjal 164, Root knot of vegetables 164, Important plants and their bacterial diseases 165, Important plants and their viral diseases 166. **142-166**

7. Bryophyta

Preamble 167, Classification 169, *Riccia* 169, *Riccia fluitans* 173, *Marchantia* 173, *Pellia* 180, *Porella* 184, *Frullania* 188, *Anthoceros* 191, *Sphagnum* 196, *Funaria* 203, *Polytrichum* 208, *Pogonatum* 215. **167 - 219**

8. Pteridophyta

Preamble 220, Distinguishing characters of taxa 220, *Psilotum* 223, *Lycopodium* 227, *Selaginella* 233, *Equisetum* 239, *Adiantum* 247, *Nephrolepis* 253, *Pteridium* 256, *Marsilea* 262, *Awla* 469. **220-272**

9. Gymnosperms

Preamble 273, Classification 273, Distinguishing characters of taxa 274, *Cycas* 275, *Pinus* 288, *Ephedra* 303. **273 - 312**

10. Palaeobotany

Preamble 313, Classification 313, Distinguishing characters 314, *Rhynia* 315, *Homophyton lignieri* 317, *Lepidodendron* 318, *Calamites* 320, *Lyginopteris* 322, *Cycadeoidea* 324, *Williamsonia* 326. **313 - 327**

Appendix

Fixing agents and preservatives 328, Stains 328, Mounting media 329, Recommended stains and mounting media 329. **329- 330**

Index

331 - 332



Thymine



Cytosine



FUNDAMENTAL OF GENETICS

For B. Sc. 3rd Semester of Botany (Honours and Regular)
Students of Assam University and Other Indian Universities.

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Ron Kemprai
Dr. Ajit Kumar Tamuli

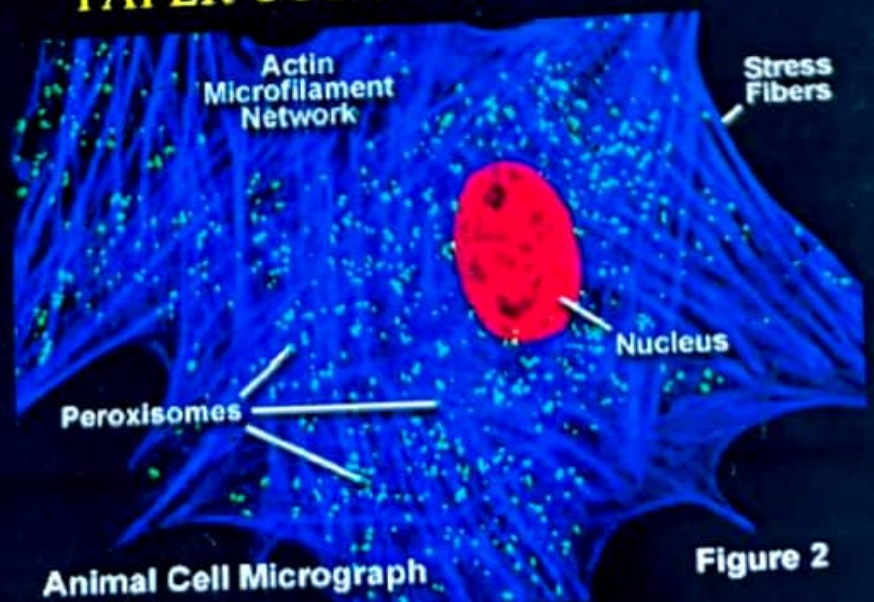


Figure 2

FUNDAMENTAL of Genetics : A Textbook for Botany For B. Sc. 3rd Semester of Botany (Honours & Regular) Students of Assam University and Other Indian Universities, written/compiled by Ron Kempur Assistant Professor, Department of Botany, Haflong Government College, Haflong and Dr. A Kumar Tamuli, Associate Professor, Department of Life Science and Bioinformatics, Assam University, Diphu Campus, Diphu. and Published by ARB Publications, House No. 14, Kushal Konwar Path, Last Lane, P.O. Ambari Fatashil, Guwahati – 781 025, Dist. Kamrup (M), Assam.

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Index

SN	Lecture	Page No
1.	History of Genetic	1-9
2.	Mendel's Laws of Inheritance and exceptions to the Laws.	10-28
3.	Types of Gene action	29-37
4.	Multiple Alleles	38-43
5.	Multiple factor Hypothesis.	44-47
6.	Quantitative traits - Qualitative traits and differences between them	48-54
7.	Cytoplasmic Inheritance	55-60
8.	Methods of inducing Mutations and C / B Technique.	61-66
9.	Mutation - it's characteristic features -	67-75
10.	Regulation Gene expression	76-82
11.	Lac operon and Fine structure of Gene.	83-98
12.	Ultra structure of cell and cell organelles and their functions.	99-118
13.	Study of chromosome structure, morphology, number and types - Karyotype and Ideogram.	119-135
14.	Mitosis and meiosis - their significance and differences between them.	136-151
15.	DNA and its structure, function, types, modes of replication and repair.	152-166
16.	RNA and its structure function and types.	167-178
17.	Transcription - Translation - Genetic code and outline of protein synthesis.	179-201

18.	Crossing over - Factors affecting it	202-214
19.	Linkage	215-223
20.	Numerical chromosomal aberrations (Polyploidy)	224-245
21.	Structural chromosomal aberrations.	246-250

Education and Sustainable Development Goals

Editors

**Ch. Beda Devi
Ch. Sonia Devi**



**Foreword
Jarnail Singh**

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Contents

<i>Prolusion</i>	ix
<i>Foreword</i>	xi
<i>Preface</i>	xiii
1. Conflict: Impact on Psychological well-being and Academic Performance of Students – <i>Sarika Sharma & Altaf Rasool Shaksaz</i>	1
2. View on Quality of Education in Modern India – <i>H.N. Narasingappa</i>	5
3. Sustainability in Jhum: Need for Environmental Education among Masses – <i>M. Bahar Uld Din Shah</i>	12
4. Empowerment of Tribal Women: Perspective from Dima Hasao District – <i>Loilungthianglimi Nampui</i>	18
5. Validity and Reliability in Qualitative Research – <i>Shweta Tewari & Shikha Diwaker</i>	25
6. Adult Education for Sustainable Development – <i>S. Kiran Singh</i>	33
7. Women Teachers in Higher Education: Their Problems and Satisfaction – <i>Arambam Bebina Devi & Soibam Birahari Singh</i>	40
8. Loktak: Sense-Making of Ecology and Collective Memory – <i>Asem Chanu Manimala</i>	48
9. Lai Haraoba of Maripur: A Living Art Form – <i>Yemlembam Gopi Devi</i>	55

Empowerment of Tribal Women: Perspective from Dima Hasao District

- Loilungthianglimi Nampui

Introduction

Women have been accorded different status in the Indian society from time to time. In its transitional state the Indian society is changing vastly. The image of women has been considered magnified and vibrant from the shades of pre-creation to illuminating professionalism in many nations. Today woman's status is determined in terms of her stronghold in various fields of economy like entrepreneurship, Non Governmental Organization, politics etc. However the status and position of women in the country entails its own complexity. There is a growing realization among the people that development would have never become self sustaining unless it was accompanied by corresponding changes in the knowledge, values, attitudes and skill of the people as a whole and more particularly of women. There is a growing awareness that gender inequality is detrimental to the development process of a nation. Human Rights have become an important and crucial issue in the context in which we live today. The discussion has become a necessity owing to the deprivation and violation of the rights of the people particularly women. Hence it became a worldwide issue addressed by both UNO and the member nation states. But despite International instruments, Constitutional provisions, special laws the status of women continues to be a cause of concern. Special provision for women are enshrined in various articles of the constitution of India but tribal women in the district have a long way to go to reap the benefits of development taking place around them and as such they have remained the most backward and deprived section of the population. This has underscored the urgency that is necessary for their uplift and empowerment.

Environmental Ecology, Biodiversity and Sustainability

A bilingual edited book

**Edited by
Dr. Liza Handique
Lalsanlevis Nampui**



Environmental Ecology, Biodiversity and Sustainability

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A Comparative Study on Antidiabetic Plants Used by the Mishing Tribe of Majuli District Based on the Management and Drug Formulation for the Promotion of Human Health	Porismita Borah Nazrul Islam	97
Woes of Environmental Degradation: A Panoramic View (With Special Reference to Selected Areas of Dima Hasao District in Assam)	Priskili Nampui	105
An Ecocritical Reading of Anuradha Sharma Pujari's 'Sikar': A Select Study	Kanyashree Bhagavaty	116
Environmental Consequences of Baghjan Oil Disaster	Tribeni Sonowal	123
An Overview of Herbalism of Upper Assam	Emon Gogoi Manashree Borchetia	135
Mapping Climate Change and Its Impact on Dima Hasao District	Dr. Loilungthianglimi Nampui	154
Toxic Gods: The River and the Widow in Mamoni Raisom Goswami's <i>Neelakanthi Braja</i>	Tejoswita Saikia	165
Natural resource management including Microbial Resources: A Mini Review	Ananya Bordoloi Denen Kr. Duarah	175
Diversity of ethnomedicinal plant used by the people of Mishing community of Nasonipara village of Golaghat district, Assam, India	Akankhya Bora Jyotishna Gogoi Liza Handique	187
Environmental Ecology, Biodiversity and Sustainability		□7

Mapping Climate Change and Its Impact on Dima Hasao District

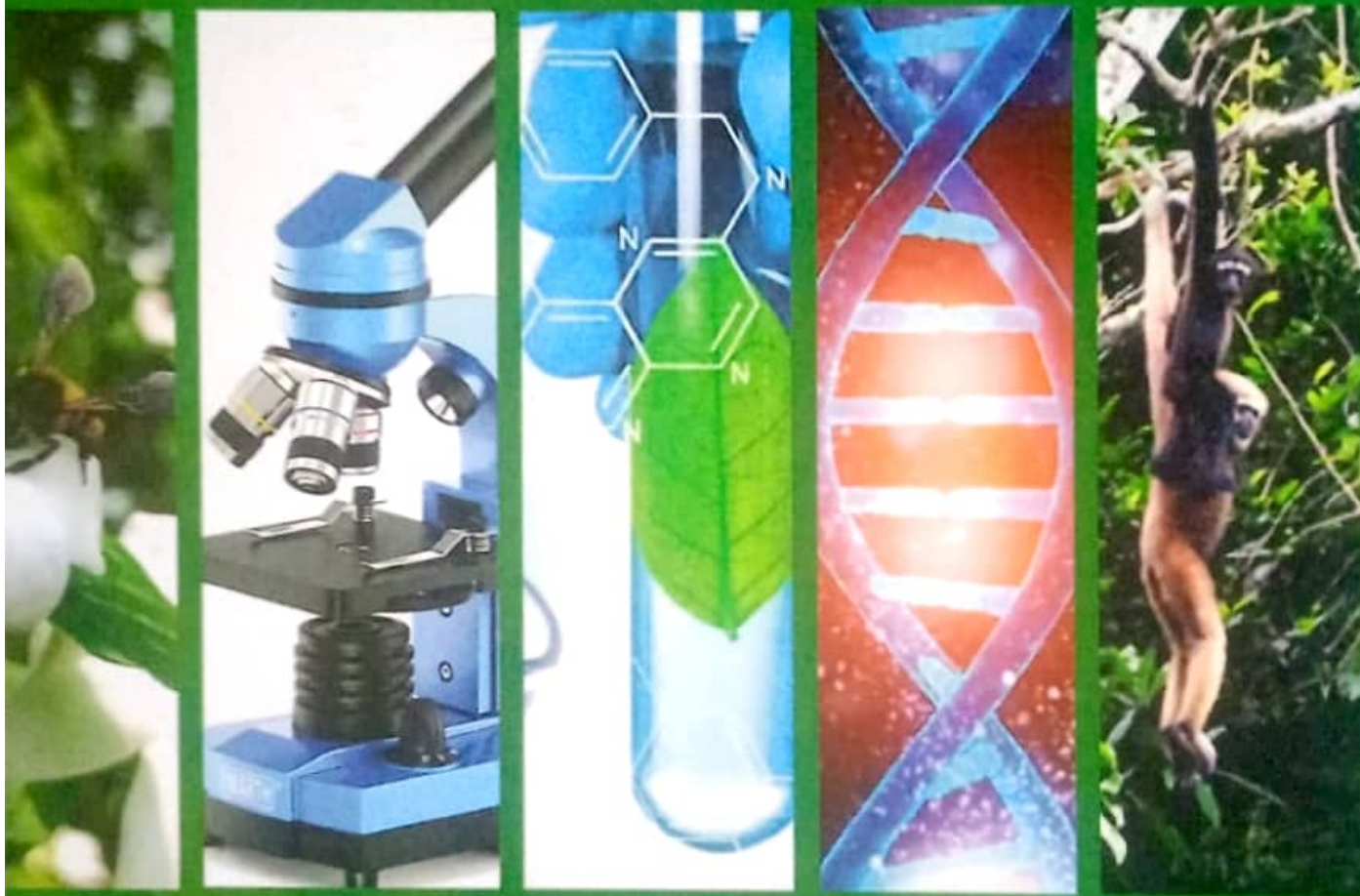
Dr. Loilunghianglimi Nampui

Department of Political Science,
Haflong Govt. College, Haflong

Abstract

One of the worst environmental challenges facing the world today is climate change. Climate change as a concern is not new in today's time and it remains infinitely patterned with various adverse impact on agriculture, water resources, forest ecology, health, coastal management and increase in temperature becoming more common than before. Heightened decline in agricultural productivity may be taken as one of the hazards resulted by climate change particularly. As a result of climate change, more occurrences of natural disasters such as earthquake, landslide, tsunami, high winds, river floods, coastal flooding, wild fires, drought as well as environmental damage has been observed in the past four decades. The escalation of severe destruction triggered by related technological and environmental disaster is threatening. The unbridled depletion of natural resources and unscientifically undertaken project have unleashed havoc and led to a tremendous loss of property and life in Assam, Dima Hasao District. In the most recent incident of heavy rains in Dima Hasao District of Assam last May in the year 2022 intensive devastations wrecked Assam's lone hill station destroying railway tracks, bridges, home and severe landslides that cost four innocent human lives. The paper aims at a careful and extensive understanding of the impact

Emerging Research Trends in **BIO-SCIENCES**



M. Islam
B. K. Das
M. C. Das

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CONTENTS

- Chapter 1** **Current threats to Biodiversity of Barak Valley, Assam, India.** 13-22
S. A. Kowser Alam Laskar, Ajit Kumar Das,
Nazimur Rahman Talukdar
- Chapter 2** **Understanding Autoimmune diseases : Its Complications and management.** 23-34
Dipika Malakar, Girin Hazarika
- Chapter 3** **Analysis of water quality parameters in Bharalu River, Guwahati.** 35-45
Pratyakhya Sarmah, Jyotishmita Kashayap,
Dr. Rajashree Saikia
- Chapter 4** **Diversity and Distribution of Butterflies in Pancharatna Hill and Adjoining areas, Goalpara District, Assam.** 45-57
Elina Aktarun Ahmed, Dr.Sushil kr. Dutta
- Chapter 5** **Synthesis of green nanoparticle from *Azadiectaindica*.** 58-69
Imdadul Islam Mondol, Milu Rani Das,
Hemen Sarma
- Chapter 6** **Seasonality in the reproduction of vertebrate.** 70-80
Namram S. Singh, Akalesh K. Verma,
Kasturi Dutta, Mary Devi, Jumi Das, Munmi Gogoi
- Chapter 7** **Reckoning Homestead tea plantations for climate change mitigation and livelihood sustainability.** 81-97
Rinku Moni Kalita, Ashesh Kumar Das, ArunJyoti Nath
- Chapter 8** **Some Invasive Alien Plant Species of Assam and their Impact on Terrestrial and Aquatic Ecosystems.** 98-105
Dimonjyoti Bora, Nilakhi Kakoti, Dulumoni Tamuly,
Ratul Nath, Munmi Borkataky

- Chapter 9** **Effect of Rhizosphere Microorganisms on Production of Plant Secondary Metabolites.** 106-131
 Nilakhi Kakoti, Dimonjyoti Bora, Munmi Borkataky,
 Dulumoni Tamuly, Ratul Nath
- Chapter 10** **Diversity and Health Benefits of Some Locally Available Food Plants Used by the Ao Tribe of Dimapur District of Nagaland, India.** 132-147
 Uttam Nath and Toshinungla Ao
- Chapter 11** **A study on the morphometric and biochemical content of egg of *Lissemyspunctataandersoni* of Dhubri, Assam.** 148-154
 Dr. Bhabesh Nath, Dr. Chandralekha Deka
- Chapter 12** **Edible insects used by the Tribal community of Goalpara district, Assam.** 155-161
 Suchitra Das
- Chapter 13** **Dendrometry and Phenology of Some Shade Tree Species in Tea Agroforestry System of Barak Valley, North East India.** 162-179
 Panna Chandra Nath, Ashesh Kumar Das,
 Rinku Moni Kalita
- Chapter 14** **Physico-Chemical and Biological Properties of the River Umshing, Meghalaya.** 180-194
 Wallambok Shangdiar, Dr. Tiewri Lyngdoh Nonglait
- Chapter 15** **Enzyme-Linked Immunosorbent Assay (ELISA): Principle, Types and Its recent advancements.** 195-207
 Mridusmita Bora, Girin Hazarika
- Chapter 16** **Ecology and management of *Leucinodesorbonalis* Guenee (Lepidoptera: Pyralidae) on brinjal (*Solanum melongena* L.) in Cachar district, NE India.** 209-221
 Tanushree Chakravarty
- Chapter 17** **Importance of Areca Nut and Betel Leaves in an Ahom Society: A study "Paan –Chewing" Habit in Mothiachiga Gohain village in Sibsagar District.** 222-230
 Dr. Dipa Patir, Dharmendra Changmai

Chapter 18 Ethnic Medicinal Healing Practices Among The Misings of Assam. 231-237

Dr. Naba Kumar Pegu

Chapter 19 Importance and Benefits of Vermiculture. 238-245

Dr. Chandana Shyam

Chapter 20 Neurochemical and Molecular mechanism of lead Induced Neurotoxicity. 246-280

Jyotirmoy Das

Chapter 21 Systematic List and Distribution of Fishes in River Jamuna in Karbi Anglong District of Assam, North East India. 281-287

Bubul Das

Bubul Das
20/09/2023

Chapter 21

Systematic List and Distribution of Fishes in River Jamuna in Karbi Anglong District of Assam, North East India

Bubul Das

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Abstract

Extensive ichthyological field survey conducted from June 2021 to May 2022 in the river Jamuna of Karbi Anglong district of Assam, revealed the occurrence of bewildering diversity of fishes. River Jamuna is one of the tributaries of Brahmaputra river system of Assam which flows through various geographical terrains of Karbi Anglong district. It portrayed 39 species of fishes belonging to 7 major orders. Of these Cyprinidae families belonging to the order Cypriniformes dominating the river. This study is a preliminary step of documentation and an attempt to compile the recent ichthyodiversity of river Jamuna. For any conservation drive or preservation oriented works, to study the bio-diversity and their role on the life supporting system is of outmost importance and hence keeping these in mind the present work has been compiled after studying the fish diversity in river Jamuna.

Keywords: River Jamuna, Brahmaputra, fish diversity, Karbi Anglong, Assam.

Introduction

North-Eastern region of India has been identified as a 'Hotspot' of biodiversity by the World Conservation Monitoring Centre (WCMC, 1998). The NE Region of India (89-97 °N to 20-30 °E) harbours about 267 ichthyospecies belonging to 114 genera under 38 families and 10 orders, which is approximately one third of the total Indian freshwater fishes (Sen, 2000). Extensive

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CONTENTS

Chapter No	Title	Authors	Pages
	<i>Preface</i>		
	<i>Message</i>		
1.	Golden Mahseer in River Barak in North-East India with a note on their Morphometry and Meristics	Anjam Hussain Barbhuiya & Devashish Kar	11
2.	Characterization of traditional fermented Missing tribe fish product <i>Numsing</i> from Northeast India	Bandita Talukdar	20
3.	An investigation on the rearing and grainage behaviour of Muga silkworm, <i>Antheraea assamensis</i> Helfer., germplasm accessions	Biswajit Sarmah	24
4.	Distribution of fishes in Krishnai river system, Meghalaya and Assam	Dilip Borah & Bubul Das	32
5.	Silkworm: an emerging model organism in animal research	Chandra Biswas	38
6.	Gonadotropin-releasing hormone (GnRH): discovery, distribution and its role in the regulation of reproduction in fishes and birds	Bidisha Kataki, Debashish Khanikar & Alope Kumar Singh	42
7.	Water quality and fish diversity of Jinjiram river, Goalpara district, Assam, India	Dhiraj Kumar Borah	60
8.	Production of Phenazine compound and biofilm by pathogenic bacteria isolated from tail and fin rot disease of <i>Channa punctata</i> (Bloch, 1793)	Dibya Jyoti Saikia	70
9.	Fishing practices in Pagladia – a northern tributary of river Brahmaputra, Assam	Hitesh Das	76
10.	Implantation: decoding the molecular determinants of embryonic attachment	Indira Sarma & Hirendra Nath Sarma	84
11.	Food plants used by Western Hoolock Gibbon (<i>Hoolock hoolock</i>) in the inner-line reserve forest of Barak valley, Assam, India	Mofidul Islam & Parthankar Choudhury	93

4. DISTRIBUTION OF FISHES IN KRISHNAI RIVER SYSTEM, MEGHALAYA AND ASSAM

Dilip Borah¹ and Bubul Das²

¹Department of Zoology, C.N.B. College, Golaghat, PIN-785612, Assam

²Department of Zoology, Haflong Govt. College, Dima Hasao, PIN-788819, Assam

ABSTRACT

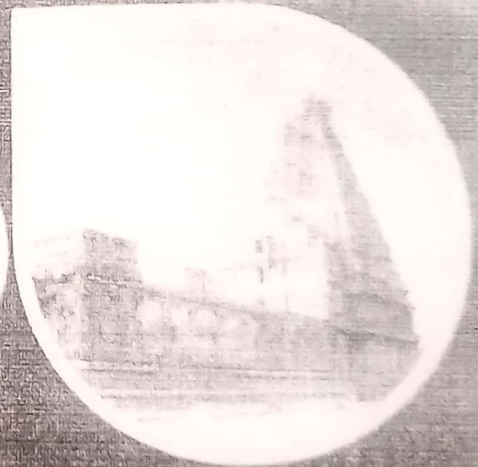
The geomorphology and distribution of fishes of Krishnai river system in Meghalaya and Assam is a part of fishery work which was carried out within the years from the year 2015 to 2019. With proper analysis of physiological adaptive character of the fishes and habited study of the stream fishes were categorised to hills stream and plains. As a tributary of Brahmaputra river some fishes of intermediate and plain zone of Krishnai are common to river Brahmaputra. 15 numbers of hill stream fish diversity in the perennial river system is a conclusive indication for the system to be conserved and managed for future utilization. In geomorphological study topographic forms in different parts of the river were observed regarding nature of river bed and embankment.

Key words: Geomorphology, Krishnai, fish, adaptive character.

INTRODUCTION

Krishnai river originates from Garo hills of Meghalaya, latitude 25°34'N and longitude 90°25'58"E. Geologically it is a part of peninsular India (Hora, 1944). The lower reaches of the river traverse through Goalpara district of Assam. Geomorphic set up and topography of river Krishnai creates two different types of fish distribution pattern. The present study gives emphasis on topographic zonation regarding fish distribution. This study is specially based on two patterns i.e., hill stream character of fishes as well as common riverine character of the fishes of the river Krishnai.

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- Chapter 37. Development of Awadhi Culture in Calcutta Under Nawab
Wajid Ali Shah (1856-87) Sk. Ansar Ali/265
- Chapter 38. A Study of Indian Art and Cultural Diversity -
Bhabita Nath/274
- Chapter 39. Post-Colonial Narratives: Diversity and Resistance in
Indian Literature and Art - Bilkis Bahar Ferdousie/282
- Chapter 40. The Importance of Understanding Ethnic Diversity,
Globalization and Nationalism in Culture -
Lakhsmi Mohan/288
- Chapter 41. Conceptualizing North-East India: Diversity
and Its Significance - Prithwish Kuri/296
- Chapter 42. Diversity in Indian Culture - Dr. Priyanka Koiri/303
- Chapter 43. Ethnic Conflict in North East India: A Case Study of Interstate
Border Dispute Between Assam and Nagaland
Runali Gogoi/308
- Chapter 44. Spirit of Place and Sense of Acceptance in Anjum
Hassan's "Lunatic In My Head" Sandip Longmailai/312
- Chapter 45. Folk Arts of India - Shabana Yesmin/320
- Chapter 46. Ethnic Culture and Diversity in North-East with
Special Reference to Dimas Community -
Swapnali Warisa/327
- Chapter 47. The Shifting Dynamics of Nationalism and Patriotism:
Examining the New Challenges to the Nation State in the
Modern Era Vaishali Gowala / 333
- Chapter 48. Depiction and Cognition in the Prehistoric Cave Rock Art
Sites in Kerala - Dr. Martiz Kurian/341
- Chapter 49. Decoding Identity: Mamang Dai's Poems as Portraits of
North Eastern Indigenous Communities - Anirban Roy/348
- Chapter 50. The Influence of Social Media on Shaping National Identity
in a Globalized World - Dildar Hussain/354
- Chapter 51. Early Childhood and Identity Formation -
Kabita Nath
Manisha Baishya / 363
- Chapter 52. Eid; The Traditional Culture of Muslim: A Study -
Wahidul Islam / 370
- Chapter 53. দেউৰী জনগোষ্ঠীৰ সাজপাৰ আৰু অলংকাৰঃ পৰম্পৰা আৰু পৰিৱৰ্তন
ড° হেমালক্ষী গগৈ / 377
- Chapter 54. বড়ো সমাজ আৰু বিশ্বায়ন
কবৰী দাস / 386

CONTENTS

Chapter 1.	A Pioneering Force for Cultural and Political Identity: A Study on Rani Gaidinliu, Daughter of the Hills	<i>Ananya Gogoi /1</i>
Chapter 2.	Navigating the Mosaic: Issues of Race and Identity Amidst the Rainbow of Ethnicities in Northeast India	<i>Archana Borah/9</i>
Chapter 3.	Realms of the Third Identity: An All-Inclusive Study	<i>Arpita Mukherjee / 19</i>
Chapter 4.	Nationalism and Patriotism: An Issues and Challenges to the Modern Nation State -	<i>Bipul Daimary / 22</i>
Chapter 5.	The Role of Ecology in the Cultural Identity of the Bodos	<i>Buddhadev Lahary/32</i>
Chapter 6.	Nation State and Ethnicity in the Art and Culture of North-East India -	<i>Dikshita Hazarika/40</i>
Chapter 7.	Cultural Diversity and National Integration	<i>Dipanjolly Nath, Ponkhi Goswami / 49</i>
Chapter 8.	From Tradition to Transformation: Women's Identity in Modern India	<i>Miss Dipsikha Das, Miss Sumi Bhagawati/57</i>
Chapter 9.	Cultural Diversity and National Integration -	<i>Elisa Moran/63</i>
Chapter 10.	Gender and Identity -	<i>Geetasree Devi/71</i>
Chapter 11.	A Sociological Investigation of Friendship Relation Among Youth in Kolkata -	<i>Gunjari Bhattacharya/77</i>
Chapter 12.	Folklores: An Intangible Source of Galo Identity	<i>Jumbi Zirdo/85</i>
Chapter 13.	Role of Technology in Identity Formation -	<i>Kabita Bora/90</i>
Chapter 14.	Reclaiming Identities through Media Discourses	<i>Lucas Narzari/100</i>
Chapter 15.	Cultural Diversity in Workplace -	<i>Dr. Pranami Chakravorty/107</i>
Chapter 16.	Gender Identity, Gender Socialization, and Aspiration for a Gender-Equal Society -	<i>Rashmi Saikia/114</i>

Spirit of Place and Sense of Acceptance in Anjum Hassan's "Lunatic In My Head"

Sandip Longmali

Anjum Hassan's "Lunatic in my Head" delves deep on the personal insights of its three pivotal characters, Aman, Moon, and Firdaus Ansari and Sopia Das, who are all a part of the other end of the dividing invisible line that separated the demography of the capital city of Meghalaya, Shillong, where the novel is based. The division is made of two significant groups often characterised by political sense of belongingness and attributed status of being aliens to the landscape of which political status of a separate state in 1972 only came true after decades of political unrest by the natives, since independence in 1947.

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Introduction to Women's Studies

Deepan Das
Tanusree Sarker
Rakhimoni Gogoi

As per
Semester System



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Contents

<i>Preface</i>	v
<i>Syllabus</i>	vi
Unit I Understanding of Women's Studies	1
• Meaning of Women's Studies	2
• Nature of Women's Studies	3
• Objectives	5
• Scope of Women's Studies	5
• Development of Women's Studies an Academic Discipline	6
Unit II Approaches to the Study of Women's Studies	10
• Liberal Approach to the Study of Women's Studies	10
• Criticism of the Liberal Approach to the Study of Women's Studies	13
• Marxist Approach to the Study of Women's Studies	14
• Criticism of the Marxian Approach to the Study of Women's Studies	16
• Radical Approach to the Study of Women's Studies	17
• Third World Feminist Approach	22
Unit III Basic Concepts in Women's Studies	26
• Patriarchy	26
• Gender	32
• Theories of Gender Socialisation	36
• Social Learning Theory	37

• Cognitive Development Theory	38
• Gender Schema Theory	39
• Psychoanalytic Theory	39
• Parents as Socialization Agents	40
• Public-Private Divide	41
• Sexual Division of Labour	43

Unit IV Women's Movements ✓ 49

• Western Women's Movement	49
• Second Wave Women's Movement	52
• Third Wave Feminist Movement	54
• Indian Women's Movement	55
• Trends of Women's Movement in India	58
• The Chipko Movement: Struggle for Conservation of Environment	63
• Anti-Arrack Movement: Women's Struggle against Liquor	64

Unit V Feminist Analysis of Socio-cultural and Institutional Basis of Women's Oppression 73

• Family as an Instrument of Women's Oppression	73
• Education as an Instrument of Women's Oppression	75
• Religion as an Instrument of Women's Oppression	76
• Women Oppression in Economic Sphere	80
• Media as an Instrument of Women's Oppression	83

Annexures

I. The Protection of Women from Domestic Violence Act, 2005	92
II. Convention on the Elimination of All Forms of Discriminations Against Women (CEDAW)	110

References

HUMAN RIGHTS & GENDER JUSTICE

Vol-3



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HUMAN RIGHTS & GENDER JUSTICE

Content :

- Discrimination and Abuse against Aged Women: A Study on Old Age Home of Guwahati, Assam/Priya Kachari/7
- Environmental Justice for Human: A Study of the novel *The Immortals of Meluha*/Patrika Handique/14
- ভূপেন হাজৰিকাৰ গীতত নাৰী চৈতন্য : এক অধ্যয়ন/মিলাকী ডেকা/19
- A STUDY ON ISSUES OF GENDER INEQUALITY THROUGH POLITICAL PARTICIPATION OF WOMEN IN INDIA/MIRINALI NARZARI/26
- অসমীয়া সাধুকথাৰ লুপ্তনিৰ্মিত লৈনিক পৰিচয় আৰু নাৰীৰ অধ্য-পৰিচয়/মুন্সল মৰাণ/31
- HUMAN RIGHTS AND DOMESTIC VIOLENCE AGAINST WOMEN/Minu Borah/39
- Women Education and Human Rights/Manjula Baruah/44
- Impact of Globalization in Northeastern Region of India/Lipikajyoti Dowarah/49
- TRIPLE TALAQ FROM THE PERSPECTIVE OF GENDER EQUALITY/ Gayotree Phukon/Debasish Hazarika/56
- A Study on Women Self-help Groups and It's Challenges in 1 no Jambari Village of Kamrup District, Assam/Farina Wahid/63
- HUMAN RIGHT AND DOMESTIC VIOLENCE/Diplipa Borgohain/68
- GLOBALIZATION AND IT'S IMPACT ON WOMEN/Bonti Hazarika/72
- THE ROLE OF HUMAN RIGHTS LITERATURE: A SELECT STUDY OF BAMA FAUSTINA SOOSAIRAJ'S 'SANGATI' AND MULK RAJ ANAND'S 'UNTOUCHABLE'/Miss Apurba Borbora/Miss Urbashi Borbora/78
- Domestic Violence and Women Rights With Reference To Assam/Alpana Gogoi/83
- বাঙালী বন্ধুৰ সেউজী পাতৰ কাহিনী উপন্যাসত প্ৰতিফলিত শোমন আৰু লিংগ বৈষম্যতা/হেমন্তা ৰাভা/87
- Practice of Human Rights in India :- A Critical Study/Dr. Ipsita Halder/93
- লক্ষ্মীনাথ বেজবৰুৱাৰ 'মুণি' অইন সাধুৰ সাধুকথাত প্ৰতিফলিত নাৰীৰ বৈবাহিক স্থিতি (নিৰ্বাচিত সাধুকথাৰ আধাৰত)/মিহাৰিকা গগৈ/97
- WOMEN EMPOWERMENT IN ASSAM: AN EDUCATIONAL PERSPECTIVE/ Karishma Handique/103
- FEMALE LABOUR FORCE PARTICIPATION AND GENDER EQUALITY/ Latumoni Gogoi/112

HUMAN RIGHTS & GENDER JUSTICE

- অসমীয়া উপন্যাসত নাৰী অধিকাৰৰ সমস্যা/মিলাকী ডেকা/118
- Migration and its Impact on Education of Morigaon District/Malabika Hazarika/122
- HUMAN RIGHTS AND THE CHALLENGES AHEAD IN NORTH EAST INDIA/Biswajyoti Gogoi/126
- "Writing as Resistance": A study of the testimonial aspects of Nadia Murad's *The Last Girl*/Chandana Das/131
- GENDER INEQUALITY : A MATTER OF CONCERN (A CASE STUDY AMONG WOMEN TEA WORKERS OF DIBRUGARH DISTRICT OF ASSAM)/Dr. (Mrs.) Deepika Dutta Saikia/136
- INFRINGEMENT OF THE RIGHT TO ADEQUATE FOOD OF WOMEN-ITS EFFECTS/Mrs. Geetima Dutta/143
- Gender inequality in India is a multifaceted issue : That concern man & women/Happy Khan/146
- Domestic Violence and Human Rights/Joyshree Mudoi/150
- Human Trafficking and Bride Trafficking/Lalparvul Pakhuongte/157
- জুৰি বৰা বৰগোহাঞিৰ 'আংকুশ' উপন্যাসত প্ৰতিফলিত মানৱ অধিকাৰ খৰণ চিত্ৰ/মলোজ কুমাৰ বৰুৱা/162
- HUMAN RIGHTS OF THE MIGRANT WORKERS/PRETI PARNA BARUAH/171
- Tea Gardens: A Gendered Space of Power, Dominance and Resistance/ Priyanka Neog/176
- অসমীয়া উপন্যাসত নাৰী অধিকাৰ আৰু সংগ্ৰামৰ ছবি/পুষ্পাঞ্জলি হাজৰিকা/183
- CHILD RIGHTS AS HUMAN RIGHT AND EDUCATION/Rameswar Baruah/187
- ড০ ৰীতা চৌধুৰীৰ 'মাকাম' উপন্যাসত প্ৰতিফলিত কামিক প্ৰৱণতা : এক অৱলোকন/চুমি কাঠাৰ/191
- GENDER EQUALITY AND WORKPLACE IN INDIA: AN ANALYSIS/Sakina Khatun/194
- Role of Law Libraries and Librarians in Legal Aid and Education/Pranjal Deka/199
- মামনি ৰাঘৱ গোহাঞিৰ 'মেই নীচৰ তেজ' গল্পত সমাজ মনস্তত্ত্ব আৰু নাৰী অধিকাৰৰ সমস্যা/ ড০ স্মৃতিৰেখা চেতিয়া সন্দিহা/205
- নাৰীৰ অধিকাৰৰোধক সম্মতিপত্ৰ দাবিৰ নব নিগন্ত তসলিমা নাসৰিনেৰ কবিতা : একাধিক বিশেষ অধ্যয়ন/সৈকত ৰাউত/212
- মানুহেৰ অমানৱিকতাৰ আৱেকমুখ শিতকম : অসম তমাপল চৌধুৰীৰ খাৰিও/প্ৰজিৎ সৰকাৰ/222
- পৌৰাণিক আশাৰে ৰচিত ড০ ৰীপক চক্ৰেৰ 'তোমাৰই নাম কণ' উপন্যাসে চিত্ৰকাণীৰ মানৱজীবনৰ সংকট আৰু অধিকাৰ অৰ্হণেৰ লড়াই : একাধিক বিশেষাধ্যয়ক অধ্যয়ন/প্ৰাণজিৎ সৰকাৰ/226
- Discovering the Trans Voice: A study of the Literature on accomodating Ambisexual Singers /Rozla Samoom/232

HUMAN RIGHTS & GENDER JUSTICE

- অসমীয়া উপন্যাসত নাৰী অধিকাৰৰ প্ৰসংগ/লেখিকা গগৈ/118
- Migration and its Impact on Education of Morigaon Distret/**Malabika Hazarika/122**
- HUMAN RIGHTS AND THE CHALLENGES A HEAD IN NORTH EAST IN-DIA/**Biswajyoti Gogoi/126**
- “Writing as Resistance”: A study of the testimonial aspects of Nadia Murad’s *The Last Girl*/**Chandana Das/131**
- GENDER INEQUALITY : A MATTER OF CONCERN (A CASE STUDY AMONG WOMEN TEA WORKERS OF DIBRUGARH DISTRICT OF ASSAM)/**Dr. (Mrs.) Deepika Dutta Saikia/136**
- INFRINGEMENT OF THE RIGHT TO ADEQUATE FOOD OF WOMEN-ITS EFFECTS/**Mrs. Geetima Dutta/143**
- Gender inequality in India is a multifaceted issue : That concern man & women/**Happy Khan/146**
- Domestic Violence and Human Rights/**Joyshree Mudoi/150**
- Human Trafficking and Bride Trafficking/**Lalparvul Pakhuongte/157** ✓
- জুৰি বৰা বৰগোহাঞিৰ ‘আংকুশ’ উপন্যাসত প্ৰতিফলিত মানৱ অধিকাৰ খৰ্বৰ চিত্ৰ/মনোজ কুমাৰ বৰুৱা/162
- HUMAN RIGHTS OF THE MIGRANT WORKERS/**PREETI PARNA BARUAH/171**
- Tea Gardens: A Gendered Space of Power, Dominance and Resistance/**Priyanka Neog/176**
- অসমীয়া উপন্যাসত নাৰী অধিকাৰ আৰু সংগ্ৰামৰ ছবি/পুষ্পাঞ্জলি হাজৰিকা/183
- CHILD RIGHTS AS HUMAN RIGHT AND EDUCATION/**Rameswar Baruah/187**
- ড॰ ৰীতা চৌধুৰীৰ ‘মাকাম’ উপন্যাসত প্ৰতিফলিত শ্ৰমিক প্ৰব্ৰজন : এক অৱলোকন/চুমি কাঠাৰ/191
- GENDER EQUALITY AND WORKPLACE IN INDIA: AN ANALYSIS/**Sakina Khatun/194**
- Role of Law Libraries and Librarians in Legal Aid and Education/**Pranjal Deka/199**
- মামণি ৰয়ছম গোস্বামীৰ ‘দেৱী পীঠৰ তেজ’ গল্পত সমাজ মনস্তত্ত্ব আৰু নাৰী অধিকাৰৰ প্ৰসংগ/ ড॰ স্মৃতিৰেখা চেতিয়া সন্দিকৈ/205
- নাৰীৰ অধিকাৰবোধ ও সমঅধিকাৰ দাবিৰ নব দিগন্ত তসলিমা নাসৰিনেৰ কবিতা : একটি বিশেষ অধ্যয়ন/ সৈকত ৱাউত/212
- মানুহেৰ অমানবিকতাৰ আৱেকমুখ শিশুশ্ৰম : প্ৰসঙ্গ ৰমাপদ চৌধুৰীৰ খাৱিজ/সুজিৎ সৰকাৰ/ 222
- পৌৰাণিক আধাৰে ৰচিত ডঃ দীপক চন্দ্ৰেৰ ‘তোমাৰই নাম কৰ্ণ’ উপন্যাসে চিৰকালীন মানবজীৱনেৰ সংকট ও অধিকাৰ অৰ্জনেৰ লড়াই : একটি বিশ্লেষণাত্মক অধ্যয়ন/প্ৰাণজিৎ সৰকাৰ/226
- Discovering the Trans Voice: A study of the Literature on accomodating Ambisexual Singers /**Rezia Sameem/232**

Human Trafficking and Bride Trafficking

Lalparvul Pakhuongte

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Haflong Government College, Haflong*

Introduction:

Human trafficking is a means where human being are used as a commodity which can be sold over and over again, unlike that of drugs and guns, which are the two other flourishing organized crimes. If we go back to history, we can see that trafficking has been defined as the trade in women and children for prostitution or other immoral purposes. Palermo Protocol was the first international instrument to called for criminalization of all acts of trafficking. The definition of Human Trafficking as given by United Nations' Palermo Protocol defines Trafficking in person as, "the recruitment, transportation, transfer, harbouring or receipt of persons, by means of the threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation. Exploitation should include, at a minimum, the exploitation of the prostitution of others or other forms of sexual exploitation, forced labour or services, slavery or practices similar to slavery, servitude or the removal of organ". (United Nations, 2000).

The concept of Human Trafficking demands for a broad perspective because there are different kinds of trafficking and each of them has its unique character or feature attached to it. The victims of human trafficking are mostly from the disadvantaged sections of the society like the isolated, poverty stricken, marginalized people, gender discrimination, etc. and also in areas where there is weak enforcement of law. People who get victimised are forced to work without pay. In one of the reports it is estimated that more than 27 million persons become victims of human trafficking every year and it is a more than 32-billion-dollar industry, the world's second largest, fastest growing criminal industry¹ and these numbers only tracks accounted cases. While the actual number is much more than projected, as many cases are not reported, and cases particularly trafficking of children and women who

THE POSTCOLONIAL EXPERIENCE :

IMPLICATIONS AND POSSIBILITIES

Editors

Ms. Rimjim Boruah

Dr. Madhulina Choudhury,

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EDITORS

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CONTENTS

S.no.	Chapter	Pg.no
1.	Postcolonial Science Fiction: Technoscapes, Globalization and Capitalist Realism - Mr. Akshaya Choudhary	7
2.	Multilingualism as Resistance in Postcolonial World in Context of Decolonizing the Mind - Anil Kumar Swadeshi Mamta Kumari	20
3.	Transnational Collocation: (Re) locating Postcolonial Theory as an Appropriative Act of Praxis - Siddhartha Mukherjee	32
4.	Mimicry as the tool of the Colonised Other to disrupt the Colonising Self in <i>Wide Sargasso Sea</i> - Ms. Debadrita Saha	47
5.	—What Was Anyone Supposed to Make of That?": <i>Small Country's</i> Defamiliarized Narrative of War and Identity -Tyler Martin Sehna	66
6.	Problematising the Politics of Migration: A Postcolonial Reading of Hwang Sok-yong's <i>Princess Bari</i> - Dr. Smaranjit Singha	80

7.	Portraying the 'Other': A Reading of Neel Mukherjee's <i>The Lives of Others</i> -Rajdeep Guha	94
8.	Ramakrishna Mission and Refugee Rehabilitation in North East India: A Historical Analysis. -Dr. Nirmalya Karmakar	107
9.	Once upon a War - Neocolonialism and the Indo-Pak war of 1971: An Analysis with reference to Asif Currimbhoy's <i>Sonar Bangla</i> -Suryatapa Nath	129
10.	Uncovering Lost Story: a reading of Mamang Dai's <i>The Black Hill</i> -Dr. Bhatima Barman	141
11.	A Post-colonial Feminist Reading of Caryl Churchill's play <i>Top Girls</i> -Rajashree Boruah	147
12.	Tribes and Citizenship: Making Sense of Citizenship Rights -Ripima Narzary	158
13.	Literature and Marginality: Tracing the Post-Colonial Strands in Select Karbi Works -Pretty Terangpi	176
14.	Reading Trauma and Other Issues of Transgender in <i>A Gift of Goddess Lakshmi</i> -Ms. Juri Bordoloi	189



15. The Subaltern Body as a Site of Protest
in *The Moth-Eaten Howdah of the
Tusker* by Indira Goswami 199
- Pallavi Bokotial
16. Psychological Trauma of the windows
in mamoni raisom goswami's in *The
shadow of the divine flute player* 210
- Gitarthi Goswami
17. Deterioration of IGBO community: *A
Postcolonial study of things fall apart* 225
-Swastika Nath
18. Diaspora Creates Multiple Identities:
An Analysis of *The Namesake* by
Jhumpa Lahiri 234
-SAKSHI DAGAR
19. Unhomeliness in Jhumpa Lahiri's story
-*Unaccustomed Earth*" and -*Hell-
Heaven*" 245
-Anikali
20. A study of Subaltern's Voice in Mulk
Raj Anand's *Untouchable* 258
-Ratna Prabha Kalyan
21. Post-colonial and Gender issues in 270
Mahesh Dattani's *Tara*
-Lalsangzuali Tuolor

CHAPTER-1

Postcolonial Science Fiction Globalization and Capitalism

Mr. A

Hindu College

I would like to investigate the
science fiction in the context of capital-
ism. Science fiction is predominantly a western
genre. I will first try and establish the
genre. I will first try and establish the
and how it relates to globalization and
of the key questions I will examine
science fiction relates to late capitalism.
What is the role of technoscapes
postcolonial science fiction genre
postcolonial science fiction represents
there a potential of subversive imagi-
of science fiction with technoscapes
the postcolonial science fiction as a
method of study will be the analysis
Chromosome by Amitav Ghosh and
Padmanabhan—two most recognizable
Indian science fiction—supplement
theoreticians and theories. I will sci-
deal with globalization, technology and
added significance, if any, they acquire
the generic conventions of science fiction
will also evaluate the dystopian in
Mark Fisher's capitalist realism, and

CHAPTER-21

Post-colonial and Gender issues in Mahesh Dattani's *Tara*

Lalsangzuali Tuolor

Assistant Professor,

Haflong Government College, Haflong.

ABSTRACT

This paper analyses the evolution of Indian English Drama in the post colonial era, taking into consideration the cultural identity to which it belongs. It is an attempt to highlight Mahesh Dattani's Tara with the concept of post colonial approach and gender discrimination. Both feminism and post colonialism search in retrieving the past into the present. Post colonialism marks the reactions to and analysis of the cultural legacy of colonialism and comprehends space for multiple voices that have been previously silenced by dominant ideologies. Feminism traces the gender based injustice and prejudices allotted to women. Patriarchy and male dominance over women in the society is a historical factor and has paved the way for the treatment of women as the 'other'. Even though women play a vital role in the constitution of society, they are labeled as the weaker sex.

The strong traditional beliefs, customs and rituals of India have a strong bearing upon its people, which Dattani reveals as reality in the form of drama. The themes of his plays are based on the reality of the lives of contemporary Indian middle class family. His plays represent the present scenario of Indian people, problems, lifestyle with different