Dr. Rathindra Nath Mandal

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Date of Birth	
Sex	Male
Qualification	M.Sc. & Ph.D. in Botany (University of Calcutta)

ROFESSIONAL EXPERIENCE

Project conducted: (as a Principal Investigator)

Name of the project	Achievements
Preliminary observation on the effect of certain herbicides on submerged weeds	• Standardization of herbicides dose to control submerged plants • Effect of herbicides on submerged plants along with other

	aquatic lives • Analysis of soil and water quality in post application of herbicides
Biological and chemical control of *Euglena* sp. and *Microcystis* sp. by means of aquatic macrophytes as biological agents	• Morphology, traits and behaviour of two nuisance plankton species • Efficacy of macrophytes to reduce nutrients from water bodies • Control of two nuisance species by aquatic macrophytes through depletion of nutrients
Influence of nutrient factors on growth performance of *Eicchornia crassipes* and *Vallisneria spiralis*	• Role of specific nutrients on growth of *Eicchornia crassipes* and *Vallisneria spiralis* • Influence of season on growth of *Eicchornia crassipes* and *Vallisneria spiralis*

Project conducted: (as a Co-Principal Investigator)	
Name of the project	**Achievements**
Development of recycling system of farm used wastewater for conservation and productivity	• Use of macrophytes for wastewater treatment
Characterization of associated bacteria and viruses in carps, catfish and prawn and their role in freshwater ecosystem.	• Investigation and characterization of micro organisms from aquaculture ponds
Organic aquaculture for some fresh water carps and prawns	• Identification and enlisting of periphyton available and utilized in organic farming
Fresh water mussel culture and quality of nacre formation	• Analysis of gut contents of mussels for estimation of food contents • Estimation of food resources for culture practice of mussels in captivity
Aquaculture Diversification and Wastewater Management – Nutrient flow in pond aquaculture system integrated using livestock and community wastes – Management of Aquatic plants pertaining to fish culture	• Estimation of ecological parameters pertaining to waste fed aquaculture • Role of hydroponics to control nutrient flow • Control of aquatic plants for better management of fish culture

Grow out culture of *Ompok pabda* and breeding of *O. bimaculatus*	• Selection of live food organisms for culture practice of *Ompok* spp.
Characterization and utilization of wastes in Aquaculture	• Bioassay experiment for determination of toxicity levels of different agro-industrial effluents • Removal of toxicity by aquatic plants • Efficacy of different aquatic plants for reducing toxic levels of different agro-industrial effluents • Utilization of different wastes for culture of fish food organisms

Teaching: (as a faculty member for M. F. Sc students)	
Division	**Subject discussed**
1. Finfish culture	Identification, classification, ecology, biomass assessment, and management of aquatic flora.
2. Nutrient management	Trophic level of aquatic biota and their status in aquatic environment. Assessment the role of aquatic flora in aquaculture.

Research guidance	❖ 'Eco-floristic survey of Aquatic macrophyte in three township regions of Orissa - A case study' ❖ 'Comparative evaluation on yield of Tubifex worm using cow dung & different agro industrial wastes'

Training attended (as a Trainee Scientist)

Topic	**Thrust area**	**Organized by**
Wise use of wetland	Categorization, utilization and management of wetlands.	British council of India in collaboration with Ministry of Environment and Forest, Govt. of India.

National Agricultural Research and Management	Research project management: problem identification, formulation, execution, monitoring and future strategy development	Indian Council of agricultural Research, Ministry of Agriculture, Govt. of India.
GIS for land resource data management	Land resource management in terms of sustenance of environment	Financed by ICAR
FAO/ CIFA/ NACA Expert consultation on intensification of food production in LIFDC's through aquaculture	Management of aquaculture in terms of sustainable environmental management	Financed by FAO/ CIFA/ NACA
Methods of assessment of Aquatic Eco-system for fish health care	Environmental monitoring to execute fish health care	Financed by ICAR
National workshop cum training on bioinformatics and statistics in aquaculture research	Biology in relation to agricultural data processing	Financed by Dept. of Biotechnology, Ministry of Science and Technology, Govt. of India
Patent search	Processing of patent	Ministry of commerce and industry, Dept. of Industrial policy and promotion, Govt. of India

Peer recognition	• Award:Young Scientist award – 2001 by ISEP for contribution on Mangrove Ecology and Biodiversity • Fellowship of Academy of Sciences for Animal welfare • Associate of Academy of Sciences for Animal welfare
Membership	• Life member of National Environmental Science Academy • Life member of Association of Aquaculturist • Life member of Indian Society of Coastal agricultural Research • Member of International Society for tropical ecology • Member of Editorial Board of Indian Society of Coastal agricultural Research

Under Ph. D. programme	Engagement as Honourary member in the following projects **'Coastal Ecology of Indian Sundarbns**" financed by Ministry of Environment & forest, Govt. of India during 1990-1996 "**Policy management of Mangrove flora**" financed by ICAR under national fellow project during 1997 • Surveyed the different ecosystems in India: Sundarbans (West Bengal), Bhitarkanika and Subarnarekha (Orissa), Mandavi & Zuary estuary (Goa), Coondapur &Ratnagiri estuary (Maharashtra coast), and Sundarbans (Bangladesh), • Studied morphology, anatomy, ecology, phenology and pollination of mangroves flora of Indian Sundarbans

PUBLICATIONS

Research paper

Mandal, R. N., Adhikari, S., Pani, K. C., Chakraborty, P. P. and Sarangi, N., 2010. Role of aquatic macrophytes for removal of nutrients from fish culture ponds, **Environment and Ecology,** 28 (1): 164-167.

Mandal, R. N., Saha, G. S. and Sarangi, N. 2010. Harvest and processing of Makhana (Euryale ferox Salisb.) – An unique assemblage of Traditional knowledge. **Indian Journal of Traditional knowledge**, 9(4): 684-688.

Das, D. N**., R. N. Mandal** and Mukhopadhyay, P.K., 2010**.** Seasonal wetlands: a unique ecosystem for regeneration of wild fish diversity, **Science & Culture**, 76(5-6): 185-190.

Mandal, R. N., Sharma, K. K., Majumder, D. and Naskar, K. R., 2009. Diversity, abundance**,** association and spatial distribution of aquatic macrophytes in flood-plain wetlands of coastal West Bengal, India**, Journal of Indian Society of Coastal Agricultural Research**, 27(2)**:** 61-67.

Mandal, R. N., Meher, P. K. and Naskar, K. R., 2009. Effect of salinity on germination and seedling development of *Heritiera fomes* Buch. Ham., **Proceeding of National Academy of Science (Bio. Sci.),** 79: 151-160.

Das, D. N., **R. N. Mandal** and Mukhopadhyay, P.K., 2009. Deepwater Rice-Fish Integrated Culture System: a Viable Option for Increasing Fish Production as well as Natural Water Harvest, **World Aquaculture**, 40:58-63.

Maiti, N. K., Mandal, A., Mohanty, S. and **Mandal, R. N.** 2009. Phenotypic and genetic characterization of *Edwardsiella tarda* isolated from pond sediments, **Comparative Immunology, Microbiology and Infectious diseases**, 32:1-8.

Mandal, R. N. and Naskar, K. R., 2007. Salt tolerant wild rice, *Porteresia coarctata* Takeoka needs more attention, **Indian Journal of Biological Science,** 13: 10-13.

Mandal, R. N., K. Kumar, U.L. Mohanty, and P.K.Meher, 2007. Estimation of gut contents of freshwater mussels, *Lamellidens marginalis* L., **Aquaculture Research** 38: 1364-1369.

Tripathi, S., N. Kumar, S. Mohanty, M. Samanta, **R. N. Mandal**, and N. K. Maiti, 2007. Characterisation of *Pseudomonas aeruginosa* isolated from freshwater culture, **Microbiological Research,** 162: 391-396.

Mandal, R.N., Saha, G.S., Das, K. M., Choudhury, B. P., 2006. Eco-floristic survey of aquatic macrophytes in CIFA farm – a case study, **Journal of Economic and Taxonomic Botany**, Vol. 30(4): 776-782.

Mandal, R. N., Adhikari, S., Das, K. M., 2002. Standardization of Glyphosate dose on disposal of Submerged weeds, **Journal of Environment Research,** 12(2) : 68 –72.

Mandal, R. N., Naskar , K. R., 2001. Morpho-anatomical studies of *Phoenix paludosa* Roxb. in relation to its halophytic adaptations, **Journal of Indian Society of Coastal Agricultural Research**, 18 (2): 161 – 163.

Mandal, R. N., Naskar, K.R., Saha, G.S., 2001. Importance of mangrove vegetation in cyclone prone coastal region, **Journal of**

	Environment Research: 11(2): 117-120. **Mandal, R. N**., Naskar, K.R., 2000. Morpho-anatomical studies of *Ipomoea pes-caprae* (L.) Sweet.in relation to its halophytic and sand dune adaptations, **Journal Interacad** 4(3): 356-359. **Mandal. R. N**., Naskar, K. R., Saha , G. S., 1999. Morpho-anatomical studies of *Heliotropium curassavicum* L. in relation to its halophytic adaptations, **Journal of Andaman Science Association,** 15(2): 89 – 90. Sanyal, P., **Mandal**, **R.N.,** Ghosh, Dolanchampa, Naskar, K.R., 1998. Studies on the Mangroves patch at Subarnarekha River mouth of Orissa state, **Journal Interacad**. 2(3): 140-149. Naskar, K.R., **Mandal**, **R.N.,** Sarkar, D., Sen, N., Sarkar, A.K., 1997. Investigations on seedlings development, vis-a-vis. plantation of *Heritiera fomes* Buch. Ham. beyond the Intertidal non-saline zones, **Journal Interacad,** I(3): 177 – 182. Naskar, K.R., Ghosh, D., Sen, N., **Mandal, R.N.,** Sarkar, A.K., 1997. Mangrove Ecology of the Indian sundarbans: Its impact on the Rural Ecology and Coastal Environment, **Journal Interacad** I(I): 49-60. **Mandal, R.N**., Ghosh, D., Ghosh, A. K., Sarkar, A.K., Naskar, K.R., 1995. On distributional record of *Schyphiphora hydrophyllacea Gaertn. f.* and *Atalantia correa* M. Roem from the intertidal mangrove forests of Indian Sundarbans, **Journal of National Botanical Society,** 49: 71-74.
Review article	**Mandal, R. N.,** Chattopadhyay, D. N. and Mukhopadhyay, P. K., 2012. Potentials of aquatic plant bio-resources. **Water Garden Journal**, 27(1): 12-19. **Mandal, R. N.**, Datta, A. K., Sarangi, N. and Mukhopadhyay, P. K., 2010. Diversity of Aquatic Macrophytes as Food and Feed Components to Herbivorous Fishes – a Review. **Indian Journal of Fish.,** 57: 65-73. **Mandal, R. N.,** Das, C. S. and Naskar, K. R., 2010. Dwindling Indian Sundarban mangroves: The way out**, Science & Culture,** 76 (7-8)**:** 247-254.

	Mandal, R. N. and Naskar, K. R., 2010. On the diversity, Adaptation and Importance of Mangroves, **Indian Journal of Biological Science,** 16: 10-18**.** **Mandal, R.N.** and K.R. Naskar. 2008. Diversity and classification of Indian mangroves – a review, **Tropical Ecology** 49(2): 131-146. ***Mandal, R. N.*** *and G. S. Saha. 2007. Aquatic vegetation – A potential support for rural economy.* ***Agricultural Situation in India,*** *Vol. LXIV, No. 6, pp. 251-255.*
Book chapter	Chakrabarti, P. P., Mandal, S. C., Paul, B. N. and **Mandal, R. N.** 2011. Untiring efforts never failing attitude made a poor farmer to reach a height of successful progressive fish farmer. In: Radheyshyam, Saha, G. S. and De, H. k. (eds.) **Aquaculture Innovations**. Central Institute of Freshwater Aquaculture (ICAR), Kausalyaganga, Bhubaneswar. pp. 114-120. **Mandal, R. N.**, Bar, R., Chattopadhyay, D. N. and Datta, A. K., 2011. Assessment of Impact of Water Hyacinth (*Eichhornia crassipes*) on Ecology and Socio-Economy. In: Roy, A. K. (ed.), **Evaluation and Impact Assessment of Technologies and Developmental Activities in Agriculture, Fisheries and Allied Fields**, New India Publishing Agency, New Delhi, pp. 291-312. **Mandal, R. N.,** Chakraborty, P. P. and Datta, A. K. 2010. Multiple Uses of Algae in Aquaculture – An Overview. In: Vinci, G. K., Manna, S. K., Suresh, V. R., Mitra, K., Srivastava, N. K., Vass, K. K. and Sharma, A. P. (eds.), **Proceedings of the 8th Indian Fisheries Forum**, IFSI, Kolkata, pp. 203-212. **Mandal, R.N.,** Jena, J.K., Das, P.C., Adhikari, S., Mohanty, P. and Sarangi, N., 2008. Eco-floristic survey of mangrove patch at Devi river estuary, Orissa. In: Gupta, N. and Mahapatra, A. K. (eds.) **Proceedings of symposium on Wetland & Mangrove Biodiversity in Orissa Coast**, Regional Plant Resource Centre, Bhubaneswar, Orissa. Maiti, N.K., **Mandal, R.N**., and Mohanty, S., 2008. Method of assessment of Microbial population and their role in aquatic ecosystem. In: Ray, A. K. and Sarangi, N. (eds.), **Applied Bioinformatics, Statistics and Economics in Fisheries Research**, pp. 151-164, New Delhi

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Mandal, R. N., Ghosh, D., Naskar, K.R., 1999. Studies on the species and varieties of *Avicennia* L. from Indian Sundarbans with special reference to their cross-pollination Mechanism, In: GuhaBakshi, D.N., Sanyal, P., Naskar, K.R. (Eds.), **Sundarbans Mangal**, Naya Prakash, Calcutta-6: pp. 263-267.

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Ghosh, D., **Mandal**, **R.N.,** Sen, N., Naskar, K.R., 1999. Studies on utilities of Saline Resistant Wild - rice, *Porteresia coarctata* (Roxb.)Takeoka from the newly silted up river flats of Indian Sundarbans. In: GuhaBakshi, D.N., Sanyal, P., Naskar, K.R. (Eds.), **Sundarbans Mangal**, Naya Prakash, Calcutta-6: pp.358-364.

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	Mandal, R.N., Naskar, K.R., 1998. Morpho anatomical studiies of *Nypa fruticans* (Thunb.) Wurmb. of Indian Sundarbans with special reference to its halophytic adaptation, In: Mukherjee, A.D., Datta, K., Sanyal, P. (Eds.), **National Proceeding on Coastal Zone Managements,** Jadavavpur University, Calcutta. **Mandal, R.N.,** Naskar, K.R., 1994. Studies on the periphytic algal on the aerial roots of the mangroves of Sundarbans in West Bengal, Recent Researches in **Ecology, Environment and Pollution**, Vol –9: 91-94. **Mandal, R.N.,** Naskar, K.R., 1991. Impact of aquatic flora for sustained productivity in humid tropics: **Proceeding of Symposium on Farming systems for sustained productivity in humid tropics,** 16-17th Dec., Port. Blair.
Popular article	**Mandal, R. N.,** 2011. Nurturing Wetlands. **Science Reporter,** November: 45-48. **Mandal, R. N**., Chattopadhyay, D. N., Saha, G. S. and Mukhopadhyay, P. K., 2010. Duck Weeds-Nature's Potential Treasures of Nourishment Source for Production of Herbivorous Fish. **Agrovet Buzz**, Vol. III (2): 26-31. **Mandal, R. N.,** Chattopadhyay, D. N., Saha, G. S. and Mukhopadhyay, P. K., 2010. Water Chestnut cum Fish Culture: A Viable Integration for Rural Aquaculture. **Agrovet Buzz**, Vol. III (5): 53-56. **Mandal, R. N**. and Mukhopadhyay, P. K., 2010. Little-known Treasures of Wetlands Need Conservation, **Science Reporter,** May: 27-29. **Mandal, R.N.,** G.S. Saha, P. Kalita and P.K. Mukhopadhyay, 2008. *Ipomoea aquatica* – an aquaculture friendly macrophyte, **Aquaculture Asia**, Vol. XIII. No. 2, pp. 12-13. **Mandal, R. N**., P. C. Das, and P. K. Mukhopadhayay, 2007. Water hyacinth - a little known role potential in aquatic ecosystem, **Aquaculture Asia**, Vol. XII. No. 3, pp. 29-31. **Mandal, R.N**., 2007. Identification and control of aquatic weeds (macrophytes), **Indian Farming**, 56(10): 37-42.

	Mandal, R.N., Saha, G.S., Mukhopadhaya, P. K., 2007. Lotus - an aquatic plant of versatile qualities, **Aquaculture Asia**, Vol. X11. No. 1, pp. 11-13. **Mandal, R.N**., Saha, G.S., 2007. Aquatic vegetation - a boon for aquaculturists, **Sabujima,** 48-51.
Book	K.R. Naskar and **R.N. Mandal,** 1999**. Ecology and Biodiversity of Indian Mangroves,** Daya Publishing House, New Delhi, Vol. I & II, pp. 1-754.