



RESEARCH NEWS LETTER

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NORTH ORISSA UNIVERSITY

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PADMABHUSAN PROF Y.C. PATI, VISITING FACULTY FROM UNIVERSITY OF MARYLAND, USA AND STANFORD LINEAR ACCELERATOR CENTRE



To commemorate the visit of son of the soil Padmabhusan Prof Jogesh C. Pati to North Orissa University, a special seminar entitling "Unity in Particle Physics and Beyond Einstein's Dream" on 5th February 2020. On his address to the gathering, he

justified "The unified gravitational force, electromagnetic force, strong force and weak force must one day come true". Amazing discoveries such as Higgs boson, gravitational waves and the accurate determination of black holes have been made in this decade and physics will be enriched in new discoveries in the coming days, he added. The session was chaired by Hon'ble Vice Chancellor Prof P.K. Chand. In his presidential address, Prof Chand expressed his gratitude to Prof. Pati on behalf of the University and asserted that the Noble Prize would be a worthy honor to Prof. Y. C Pati for his seminal contribution in particle physics. The seminar was attended by faculty members, students and research scholars from different PG Departments. Prof Pati captivated the audience by answering their questions very lucidly. At the end, Prof Pati discussed with students of PG department of physics on a new research domain on particles such as quark, neutrino, lepton etc.

THE APJ ABDUL KALAM BIODIVERSITY PARK: EXPERIENCING SIMILIPAL PLANT BIODIVERSITY IN THE CAMPUS

The A.P.J. Abdul Kalam Biodiversity Park of North Orissa University, Baripada was inaugurated on 3rd July 2020 to promote, preserve and publicize Similipal biodiversity among scholars, tribal, rural and common citizens. The Park is holding 94 trees, 164 herbaceous plants, 42 shrubs and 32 climbers; from which 81 species are having medicinal properties. The Park is also believed to play a great role in conserving several RET (Rare, Endangered and Threatened) species which includes Saracaasoca, Oroxyllumindicum, Gloriosa superba, Pterocarpus santalinus, Rouvolfiaserpentina, Pterocarpus marsupium, Paederiafoetidaetc. and several Carnivorous plants of genera Drosera and Utricularia. It is a store house of Hydrophytes, Gingers, Orchids, Ferns, Palms, Timber and Medicinal plants.

Research Highlights

Title : Comparative transcriptome analysis of blastemas of regenerating and regeneration-deficient limbs of Indian tree frog *Polypedates maculatus* (Gray,1830)

Investigator : Dr Cuckoo Mahapatra, Department of Zoology

Funded By : DST-SERB, Govt. of India

Findings : This is the first ever transcriptome analysis of normal and hind limb blastemas of tadpoles and froglets of Indian tree frog *Polypedates maculatus* published in the NCBI. The data from the transcriptome is relevant for limb regeneration studies in *P. maculatus*. The publication can be accessed with NCBI Bioproject accession no. PRJNA669113 (<https://www.ncbi.nlm.nih.gov/bioproject/PRJNA669113>).



Title : Additions to the cicada (Insecta: Hemiptera: Cicadidae) fauna of India: first report and range extension of four species with notes on their natural history from Meghalaya.

Investigator : Dr Cuckoo Mahapatra, Department of Zoology

Funded By : Collaborative work with Zoological Survey of India, Kolkata

Findings : The work describes the additions of four species of cicadas to the fauna of India. This work provides an account of the taxonomy, natural history, distribution, and acoustics of these four species of cicadas along with their attribute to the culture and customs of the indigenous tribes of the landscape (<https://doi.org/10.11609/jott.5668.12.9.16021-16042>).



Meimnaduffelsi



Dundubiaannandalei



Balintatenebricosa



Orientopsaltriafangrayae

Title : A novel, diminutive *Hemiphyllodactylus* Bleeker, 1860 (Squamata: Gekkonidae) from a sacred grove in Odisha, eastern India

Investigator : Dr Cuckoo Mahapatra, Department of Zoology

Funded By : Collaborative work with Zoological Survey of India, Kolkata, Thackeray Wildlife Foundation, Mumbai and Don Bosco University, Assam

Findings : A new species of *Hemiphyllodactylus* from a sacred grove near Humma in Ganjam District of Odisha state, eastern India. Additionally, the new species was 16.0-22.7% divergent from all other peninsular Indian *Hemiphyllodactylus* in uncorrected ND2 sequence data. The new species is the first member of the genus described from Odisha state and also the first *Hemiphyllodactylus* known from < 100 m asl. The discovery of *Hemiphyllodactylus minimus* sp. nov. from a low elevation coastal locality in the Eastern Ghats open ups the possibilities that the genus could be more widespread than currently understood and potentially harbour many more distinct undescribed lineages. (<https://www.biotaxa.org/Zootaxa/article/view/zootaxa.4852.4.6>).



Title : Sphingosine 1 Phosphate in malaria pathogenesis

Investigator : Dr G Dhangadamajhi, Department of Biotechnology and Prof. Shailja Singh at Jawaharlal Nehru University

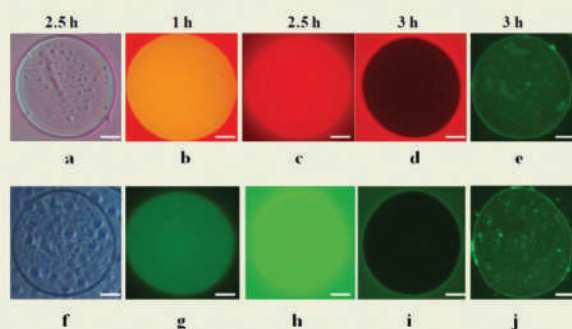
Funded by : ICMR, INDIA

Findings : The significance of Sphingosine 1 Phosphate, a bioactive lipid in the context of malaria was investigated and discussed. The study discussed how RBC content of S1P can be channelized in a better way for its possible implication in therapeutic opportunities to control malaria.

Title : Electroformation of liposomes and phytosomes using copper electrode

Investigator: Dr S.K. Sahu, Department of Biotechnology

Findings : A novel method for electroformation of liposomes and phytosomes using copper electrode is described. Liposomes made at 2 V and 10 Hz AC field from L- α -egg-phosphatidylcholine (egg-PC), *K. pneumoniae* phosphatidylethanolamine, *K. pneumoniae* polar lipids and *E. coli* polar lipids on copper electrode. All liposomes were unilamellar as indicated by their unilamellar indices of 50 ± 2 , had surface charge comparable to vesicles made from lipid(s) with similar composition and exhibited only 1–2 mol% of oxidized lipids. Cu concentration in the liposomal samples was <1.5 ppm for large unilamellar vesicles (LUVs) and ≈ 5 ppm for giant unilamellar vesicles (GUVs). The vesicles were stable for >15 d without loss of their size, charge, or unilamellarity. The method was successfully applied to prepare phytosomes from egg-PC and a phytochemical fraction of *Dimorphocalyx glabellus*, a medicinal plant with anti-diuretic properties. Our method is easy, inexpensive and convenient that will prove to be useful for preparation of liposomes and phytosomes

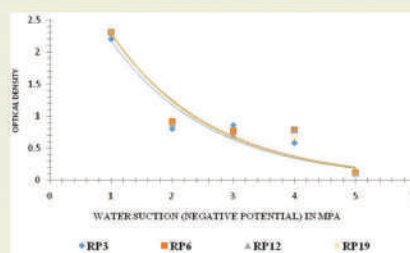


Images of GUVs formed from *K. pneumoniae* phospholipids those trapped sulforhodamine B (a–e) and carboxyfluorescein (f–j) inside the vesicles. a and f: images taken in bright field at 2.5 h of electroformation; b, c, d and g, h, i show fluorescent images obtained after 1, 2.5, and 3 h of swelling, respectively. e and j show fluorescent images of NAO-stained GUVs. Scale: 10 μ m (<https://doi.org/10.1080/08982104.2020.1800729>)

Title : Optimisation of exopolysaccharide production from rice rhizospheric soil

Investigator: Dr S. K Nayak, Associate Professor, Department of Biotechnology

Findings : A total of 22 EPS producing bacteria were isolated from the rice rhizospheric region and amongst 4 isolates were found to tolerate maximum level of water stress (-0.73 MPa). Further, optimization studies indicated that all these 4 bacterial isolates produced EPS at 37°C , 80 mM salt concentration and pH value 7.5 within 3 days of incubation. Further, among different carbon sources, sucrose followed by glucose was found to be best for production of EPS. The growth pattern (as measured in terms of turbidity in PEG 6000) (negative potential) of four potent EPS producing bacterial isolates under different moisture stress conditions (Shown in Figure). These findings indicated a positive correlation between carbon pools and total and colloidal EPS production (<https://doi.org/10.1016/j.rhisp.2020.100206>).



Title : Tree species composition and carbon stocks assessment in different forest types of Similipal Biosphere Reserve, Odisha

Investigator: Dr S. C. Sahu, Department of Botany
Funded By : Science & Technology Department, Govt. of Odisha

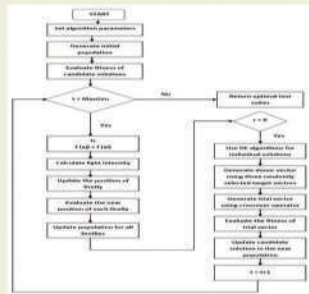
Findings : Dr. Sudam Charan Sahu and his team members of Department of Botany, North Orissa University in collaboration with faculty from Utkal University, Bhubaneswar have assessed the carbon stock and its relation with tree biodiversity in Tropical Moist Deciduous Forest of Similipal Biosphere Reserve, Odisha, India. This paper is published in Tropical ecology 61(4): 497-508. DOI: 10.1007/s42965-020- 00111-8

Research Highlights

Title : **Test Suit Generation for Object Oriented Programs Using Hybrid Firefly Algorithm**

Investigator : **Dr. Sujata Dash, Department of Computer Application**

Findings : A hybrid algorithm is adopted to generate optimized test suits for the benchmark triangle classification problem. Experimental results evidently show that the hybrid FA-DE search algorithm outperforms the individual model-based Firefly and Differential Evolution algorithm's performances in terms of time complexity, better exploration and exploitation as well as variations in test case generation process. The framework generates optimized test data for complete transition path coverage of the available feasible paths of the example problem.



Hybrid FA-DE Flow Chart

Title : **Zn Doping Induced Enhancement of Multifunctional Properties in NiO Nanoparticles**

Investigator : **Dr P Mallick, Department of Physics**

Investigator : **UGC-DAE CSR, Mumbai**

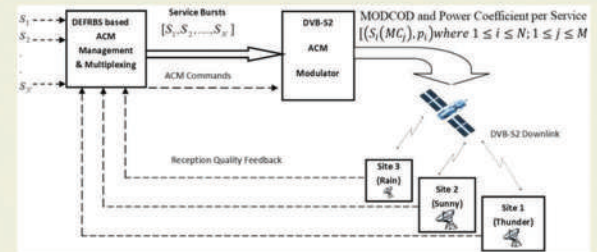
Investigator : **Collaborative work with Zoological Survey of India, Kolkata**

Findings : Dr. Pravanjan Mallick and his team of Department of Physics, North Orissa University in collaboration with UGC-DAE CSR, Mumbai and Indore, Institute of Physics, Bhubaneswar and Fakir Mohan University, Balasore have studied the effect doping on the optical and magnetic characteristics of NiO nanostructures with an aim to utilize this material for multifunctional device applications. Their study indicated that Zn as well as Mg doped NiO nanoparticle samples could be useful for multifunctional device applications. <https://doi.org/10.1016/j.jallcom.2020.155050>; <https://doi.org/10.1088/2632-959X/aba285>

Title : **Dynamic MODCOD and power allocation in DVB-S2: a hybrid intelligent approach. Telecommunication Systems**

Investigator : **Dr. Sujata Dash, Department of Computer Application**

Findings : An adaptive modulation, coding (MOD-COD) and power scheme is proposed. By investigating a fuzzy system and differential evolution algorithm, to select the set of MODCODs and optimum power vector, respectively, for the next transmission interval. From the simulation results, it is apparent that the proposed scheme is promising in terms of efficient link and transmit power utilization as well as quality of service compared to the schemes in the literature with flat power distribution.



Proposed Model

Patents/MoU/Awards/Publications/Ph. D

Ph.D : 36

Publications

- Research articles (UGC care enlisted) : 76
- Book/Book Chapters : 59
- Patent : 7
- MoU : 3
- Awards (Research) : 39

EVENTS

ANNUAL MEETING OF ORISSA BOTANICAL SOCIETY



North Orissa University hosted the 44th Annual conference of Orissa Botanical Society and the National Seminar on "Green Technology for Environment Management" On 22nd -23rd January 2020. The meeting was presided by the Hon'ble Vice Chancellor and former president of the society Prof. Pradeep Kumar Chand who spoke on the purpose and scope of the Orissa Botanical Society for promotion of studies in plant science and environment conservation, protection and management. The conference was inaugurated by the Chief Guest Prof. N. H. Ravindranath, an internationally distinguished scientist of Indian Institute of Science, Bengaluru, who highlighted the long reach application of botany with advanced and allied subjects for the benefit of mankind. He also expressed the significant role of botany for mitigating environmental issues and climate change. The project director of Indian Institute of Tropical Meteorology and the winner of the Bhatnagar Award, Dr Guoffran Begg as the Guest of Honor spoke on how the use of green technology can be successful in controlling climate change and environmental pollution. Prof U. B. Mohapatra, Head, Department of Botany and the convener of the conference introduced the guest. Dr Chinmay Pradhan, Secretary, OBS read out the Annual Report and Prof. Anil Kumar Biswal, Department of Botany, the organizing secretary of the conference proposed the formal vote of thanks to all the participants. On this occasion, the official journal of the society "Plant Science research" and the souvenir of the national seminar was unveiled. The session was attended by about 400 eminent botanists, researchers and students from various educational and research institutes across the country and members of teaching faculty of PG department of Botany, Biotechnology, Anthropology and Tribal Studies, Wildlife and Biodiversity Conservation, RS & GIS and Zoology

CELEBRATION OF NATIONAL SCIENCE DAY ON 28TH FEBRUARY 2020



The national science day which is celebrated to commemorate discovery of the 'Raman Effect', which led to Sir C.V. Raman winning the Noble Prize was observed on 28th February 2020 at North Orissa University. The function was attended by large number of students and faculty members from different PG departments of North Orissa University. Hon'ble Vice Chancellor Prof P. K. Chand graced the occasion as chief guest. In his speech Prof. Chand emphasized the importance of science and encouraged for pursuing research on cutting edge areas. On this occasion, Prof Susmita Kar, Chairperson, PG Council, addressed the audience citing the significance of the science day and also emphasized the contribution made by the noble laureate Sir C.V. Raman towards the growth of science in India.

Research Grants Received

PI: Dr. Pratap kumar Jena, Economics

Title: Causal link between food inflation and supply chain management practices in India

Funding Agency: IOE-Directorate

Amount: 30.66 Lakhs

PI: Dr. Gargee Mohanty, Zoology

Title: Conservation of fish waste as a plant growth supplement

Funding Agency: DST, Odisha

Amount: 9.47 Lakhs

Seminar/Conference/Training/Workshop Organized

Department	Level National/ International/ State	Category	Title
Placement Cell	University	Training	Career Counseling
Education	State	Lecture Series	Education For Sustainable Development: Issues And Challenges
Geology	University	Seminar	Field Techniques In The Study Of Geology
IQAC	University	Workshop	NAAC Awareness
Economics	University	Workshop	Awareness Programme On RTI Act, 2005 Organized By Odisha Soochna Adhikar Abhiyan, Mayurbhanj
English	National	Seminar	Literature And The State: Lineages And Futures'
Material Science	National	Conference	Science of Engineering Materials
Odia	State	Seminar	84th Year Observation Odisha Pradesh Gathana Re
Odia	State	Seminar	6th Year Observation Odia BhasaSastriyaBhasaManyata
Odia	National	Seminar	Prakruti Sahitya O SabujhaSamalochana
Education	State	Educational Drive	Teach Mayurbhanj: A Need-Based Educational Drive
Odia	State	Seminar	Inauguration of The University Literary Council
Sanskrit	National	Seminar	Sanskrit And Nationalism
Anthropology & Tribal Studies	National	Seminar	Participation Of Indigenous Tribes in Biodiversity Conservation Anthropology Tribal Studies And Center For Similipal Studies
Placement Cell	State	Workshop	Career Counseling