RESEARCH NEWS LETTER

ISSUE: 2 2019

NORTH ORISSA UNIVERSITY

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Inside the Issue

HON'BLE VICE CHANCELLOR, PROF. PRADEEP KUMAR CHAND RECEIVED THE PRESTIGIOUS 'PRANA KRUSHNA PARIJA AWARD' FOR 2019

Hon'ble Vice Chancellor, Prof. Pradeep Kumar Chand received the prestigious 'Prana Krushna ParijaAward' for the year 2019 at Sarala Bhavan, Cuttack on 2nd June 2019. This Award was conferred on Prof. Chand in recognition of his significant contributions to the field of Plant Science in general and Plant Biotechnology and Genetic Engineering in particular in form of teaching and research, thereby motivating the young researchers throughout a career span of over three decades.

UNIVERSITY ADOPTS DIGITAL SCORE SHEET METHOD FOR QUANTITATIVE ADJUDICATION OF PH.D. THESES

North Orissa University has adopted the Plagiarism Policy for Ph. D thesis submission including language subjects like Odia, Santali, Sanskrit. Further a Digital Score Sheet method for quantitative adjudication of Ph.D. thesis was decided in a special meeting of Academic Council on 22.05.2019. It was also decided that prior to implementation, the digital mode of evaluation of Ph.D. thesis will be subject to examination by a committee (constituted for the purpose) followed by approval of same in the next academic council meeting.

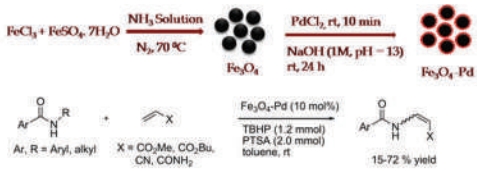
Research Highlights

Title : Effect of anti-oxidant and pesticide on earthworm and its implication
Investigator : Dr Puspanjali Parida, Department of Zoology
Funded By : DST Govt. of Odisha, Odisha
Findings : Earthworms (Soil Engineer) occupy more than 80% of the total soil faunal biomass according to many Indian agricultural system (384 species are reported in India). Due to soil pollution (pesticide) the earthworm undergo oxidative stress which affects the species composition, depth distribution, age structure, growth rate, survival of earthworm. In the present work, Growth, maturation, life cycle, behaviour, biochemical parameter and histological alteration in response to Furadan, vitamin A and Curcumin were studied and compared. Antioxidants such as curcumin, vitamin A may reduce the adverse effect of furadan for the soil dwelling earthworm. Further study in this field required to find other low cost alternative (cost effective) antioxidant to reduce the adverse effect of the soil toxicity on soil dwelling organism.

Effect of pesticides on the morphology of earthworm

Title : In vitro growth inhibition and apoptosis in human cervical cell lines
Investigator : Dr P. R. Debata Department of Zoology
Findings : Using an emerging programmable clustered regularly interspaced short palindromic repeat (CRISPR)/Cas13a system, Dr P Debata and his collaborators from Uttar-Pradesh of India, China, Russia and South Africa have cleaved HPV 16/18 E6/E7 messenger RNAs (mRNAs), which led to growth inhibition and apoptosis in human cervical cell lines in vitro. Their study demonstrated that targeting HPV E6/E7 mRNAs by the CRISPR/Cas13a system may be a candidate therapeutic strategy for HPV-related cervical cancer

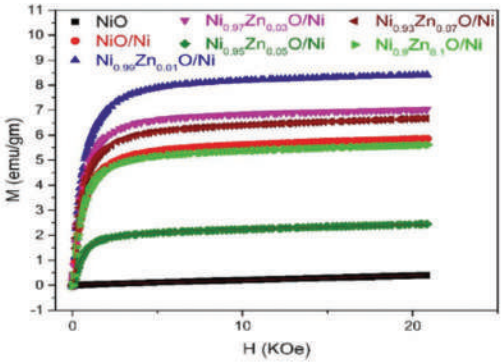
Title : Magnetically recyclable palladium nanoparticles (Fe3O4-Pd)for oxidative coupling between amides and olefins at roomtemperature
Investigator : Dr Ashis Kumar Jena, Department of Chemistry
Funded By : SERB and UGC
Findings : A convenient method for the synthesis of magnetically recyclable palladiumnanoparticles (Fe3O4-Pd) is described. The catalytic application of the Fe3O4-Pdnanoparticles was explored for the first time in oxidative coupling betweenamides and olefins. p- Toluenesulfonic acid plays a significant role in the oxidative amidation reaction. The reaction proceeds at room temperature, resultingin (Z) - enamides under ambient air in the absence of co - catalyst and ligand.The superparamagnetic nature of Fe3O4-Pdfacilitates easy, quantitative recovery of the catalyst from a reaction mixture, and it can be reused for up to threeconsecutive cycles with a slight decrease in catalytic activity (DOI: 10.1002/aoc.4985)



Fe3O4-Pd NPs catalyzed stereoselective synthesis of enamides

Title : Effect of Ion Irradiation on the Resistive Switching Characteristics of NiO/ZnOHheterojunction
Investigator : Dr P Mallick, Department of Physics
Funded By : IUAC, New Delhi
Findings : Dr. Mallick in collaboration with IUAC, New Delhi, UGC-DAE CSR, Indore, Utkal University, Bhubaneswar and Fakir Mohan University, Balasore have studied the effect of ion irradiation on the resistive switching (RS) characteristics of NiO/ZnOheterojunction with an aim to utilize this material for memory device applications. Their study indicated the improvement of the RS characteristics of NiO/ZnO heterojunction upon ion irradiation at certain fluence of ion irradiation.
DOI : https://doi.org/10.1088/2053-1591/ab39

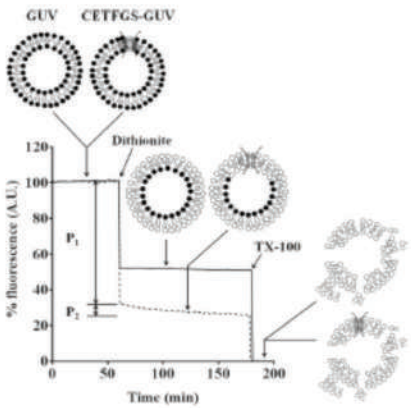
Title : Structural, optical and magnetic properties of Ni1−xZnxO/Ni nanocomposite
Investigator: Dr P Mallick, Department of Physics
Funded By : UGC-DAE CSR, Mumbai
Findings : Dr. Mallick in collaboration with UGC-DAE CSR, Mumbai and Utkal University, Bhubaneswar have studied the effect doping on the optical and magnetic characteristics of NiO/Ni nanostructures with an aim to utilize this material for multifunctional device applications. Their study indicated that 1% Zn doped NiO/Ni nanocomposite sample with the highest value remanent magnetization and anisotropic constant could be ideal for its use in various device applications like magnetic recording media (DOI:https://doi.org/10.1007/s42452-019-0461-0)



Variation of magnetization with magnetic field for NiO and Ni1−xZnxO/Ni (x = 0 to 0.1) nanocomposite taken in first interval (i.e., 0 to H) measured at 300 K. The solid line corresponds to the fitted data to the experimental data.

Title : Biochemical constituents in leaves of primary host of tasar silkworm
Investigator: Prof. N. Mohanty, Department of Zoology
Findings : Important biochemical constituents of the three primary host plants, i.e., Terminalia tomentosa (asan), Terminalia arjuna (arjun) and Shorearobusta(sal) of the tropical tasar silkworm Antheraeamylitta Drury were analyzed. The biochemical constituents, like protein, ascorbic acid, reduced glutathione and level of lipid peroxidation were assayed. The results indicate that the concentrations of protein, ascorbic acid and reduced glutathione were highest in sal followed by asan and least in arjun. The level of lipid peroxidation was highest in asan and lowest in sal (DOI : 10.5958/0974-8172.2018.00283.3)

Title : Terpenoid fraction of Gymnemasylvestre as a therapeutic target
Investigator: Dr S.K. Sahu, Department of Biotechnology
Funded By : DST, Govt. of Odisha, Odisha
Findings : Insisted with terpenoid fraction of Gymnemasylvestre as a therapeutic target, earched for novel membranotropic terpenoids and their mechanism of action. The lipid-flippase activity of the terpenoid fraction showed concentration and incubation dependent cooperativity, indicating their lipophilic nature and membrane-destabilizing activity that facilitated lipid translocation. Their study was first in reporting the flippase activity of a terpenoid fraction of Gymnemasylvestre which could be further explored for their membrane-mediated pharmacological properties.
Flippase activity of CETFGS. Schematic diagram of flippase assay. Initial fluorescence of both control GUVs as well as GUVs incubated with CETFGS CETFGS-GUVs) exhibited 100% fluorescence (F0) as shown by their dark head groups. Addition of dithionite at 1 min deceased the fluorescence in both GUVs and CETFGSGUVs. While GUVs show quenching of NBD-lipids located on outer leaflet only, leading to ~ 50% NBDfluorescence quenching, CETFGS-GUVs observed a larger (⊠ 50%) fluorescence quenching due to flipping of NBD-lipids from inner leaflet to the outer leaflet. The total quenching is a combination of a fast (P1) and a slow (P2) phases. Addition of triton X-100 lyses the membrane, leading to ~ 100% NBD-fluorescence quenching for both GUVs and CETFGS-GUVs (DOI 10.1007/s12010-020-03399-3) .



Research Highlights

Title : Factor productivity and marketed surplus of NTFP: a study of STs in Similipal area of Mayurbhanj district of Odisha

Investigator : Dr. Pratap Kumar Jena, Assistant Professor, Dept. of Economics

Funded By : ICSSR, New Delhi

Findings : The project was sanctioned by the ICSSR, New Delhi to analyse; (i) the collection, retention and marketing of NTFPs, (ii) estimate the marketed surplus of NTFPs, (iii) analyse the factors influencing marketed surplus, and (iv) estimate the total factor productivity of NTFPs in the Similipal area of Mayurbhanj district of Odisha. From the primary data, the study found that more than 90% of households in the study villages collect NTFPs, among them women are larger numbers compared to men, most of them are illiterate, and sale their product to traders. The households earned more than 50% of total annual income from NTFPs, followed by wage labour and agricultural crops. There is marketed surplus of NTFPs and also positive total factor productivity. To strengthen the livelihood of STs through NTFP in the study area, the government of Odisha should immediately solve the problems related to marketing of NTFPs, pricing of NTFPs, awareness of medicinal plants, their uses and market values.

Title : Isolation and characterization of anti-plasmodial metabolites from selected medicinal plants

Investigator : Dr. G Dhangadamajhi, Department of Biotechnology

Funded by: DST, Govt of Odisha

Findings : The anti-malaria activity of Cuscutareflexawhich was being used in the treatment of malaria by indigenous people of Odisha. The study revealed potential in vitro anti-plasmodial activity of methanol extract and its sub-fractions against different strains of drug-resistant malaria parasites. Besides, these fractions were shown to suppress parasitemia level in in vivo studies and improved the mean survival time in experimental mice, similar to the standard anti-malarial drug artesunate. The study warrants further exploration of these potent fractions for lead phyto-drug discovery.

Title : Edge and Fog Computing in Healthcare – A Review

Investigator : Dr. Sujata Dash, Department of Computer Application

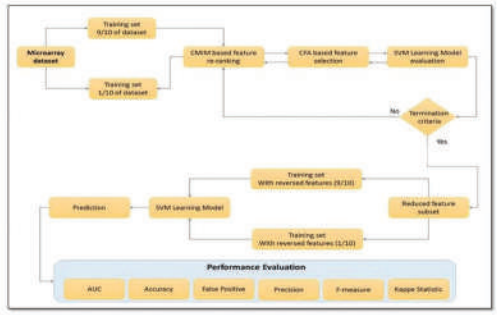
Findings : The review undertaken in this paper focuses on three important areas: firstly, the enormous amount of computing tasks of healthcare system can take mileage of these two computing principles; secondly, the limitation of wireless devices can be overcome by having higher network tiers which can execute tasks and aggregate the data; and thirdly, privacy concerns and dependability prevent computation tasks to completely move to the cloud. Another area which has been considered in the study is how Edge and Fog computing can make the security algorithms more efficient. The findings of the study provide evidence of the need for a logical and consistent approach towards fog and mist computing in healthcare system.

Title : A Modified Firefly based Meta-Search Algorithm for feature selection: A Predictive Model for Medical Data

Investigator : Dr. Sujata Dash, Department of Computer Application

Funded by : Association of Commonwealth (Titular Fellowship)

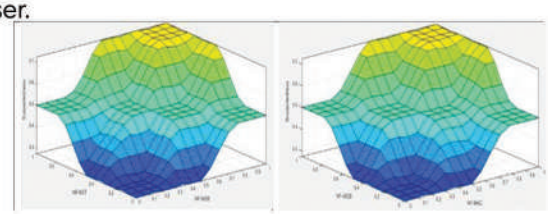
Findings : TA novel hybrid swarm intelligence-based meta-search algorithm is proposed by combining a heuristic method called conditional mutual information maximization with chaos-based firefly algorithm. The chaos-based firefly algorithm increases the global search mobility of fireflies. The efficiency of the model is studied over high-dimensional disease datasets.



Title : Hybrid chaotic firefly decision-making model for Parkinson's disease diagnosis
Investigator: Dr. Sujata Dash, Department of Computer Application
Findings : A novel chaos-based stochastic model is proposed by combining the characteristics of chaotic firefly algorithm withKernel-based Naïve Bayes (KNB) algorithm for diagnosis of Parkinson's disease at an early stage. The efficiency of themodel is tested on a voice measurement dataset that is collected from "UC Irvine Machine Learning Repository."The experimental study of the problem established thatchaos-based logistic model overshadowed other chaotic models. In addition, four widely used classifiers such as Naïve Bayes classifier, k-nearest neighbour, decision tree, and radial basis function classifier are used to prove the generalizationand stability of the logistic chaotic model.

Work-Flow Diagram of CFA-KNB Model

Title : A Neuro-Fuzzy Approach for User Behavior Classification and Prediction
Investigator: Dr. Sujata Dash, Department of
Funded by: This research was supported by the KIAT (Korea Institute for Advancement ofTechnology) grant funded by the Korea Government (MOTIE: Ministry ofTrade Industry and Energy). (No. N0001791, HRD Program for ICTConvergence Smart Rehabilitation Industrial Education Program) and theSoonchunhyang University Research Fund.
Findings : A neuro-fuzzyapproach for the classification and prediction of user behaviour is proposed. A dataset, composed of users'temporal logs containing three types of information, namely, local machine, network and web usage logs,istargeted.-Forprediction, a Gaussian Radial Basis Function Neural Network(GRBF-NN) is trained based on the example set generated by a Fuzzy Rule Based System (FRBS) and the360-degree feedback of the user.



Achievements

Dr. Sisira Behera, Assistant Professor, Department of Odia is felicitated by the University for 'Kendriya Sahitya Academy YuvaPuraskar' for the year 2019

Dr. P. Mallick, Assistant Professor, Department of Physics, North Orissa University receiving the award for best poster presentation

Prof. H.N. Thatoi visited Malaysia for participation and presentation as chief speaker in 2nd International Postgraduate Symposium in Biotechnology, 2019, University of Technology Malaysia, Malaysia

Book Release

- Release of edited book on Biotechnology for sustainable utilization of bioresources edited by H.N. Thatoi and S.K. Nayak. Astral publication, 2019
- Release of book on Baikunthanath Bramhachari By Dr. Sisir Behera, Assistant Professor, Depament of Odia, North Orissa University, Keonjhar Campus, Keonjhar.

Patents/MoU/Awards/Publications/Ph. D

Ph.D	: 24
Publications	
• Research articles (UGC care enlisted)	: 66
• Book/Book Chapters	: 57
• Patent	: 0
MoU	: 1
Awards (Research)	: 19

Research Grants Received

DEPARTMENT OF CHEMISTRY RECEIVES 2ND PHASE DST -FIST GRANT

The Post-Graduate Department of Chemistry of North Orissa University is established in the year 2004. The Department has well equipped post graduate and research laboratories. The Department was under DST-FIST assistance during 2009-2014 and UGC-SAP during 2009-2014. The Department is under the cover of DST-FIST assistance and has received a 2nd phase grant of Rupees Sixty Lakhs only for the purchase of sophisticated instruments like atomic absorption spectrophotometer, fluorescence spectrophotometer and zeta size analyzer.

PI: Dr. S. Dash, Computer Application
Title: Plagiarism detection softwares for odia documents using Fuzy neural network
Funding Agency: DST, Odisha
Amount: 8.04 Lakhs

PI: Dr. I. Naik, Physics
Title: Effect of magnetic and non-magnetic element (Fe, Zn & Al) substitution on synthesis and characterisation of MnTiO3
Funding Agency: SERB, NEW DELHI
Amount: 34.1 Lakhs

PI: Dr. S. Dash, Computer Application
Title: Collaborative project on rural transformation through customised training, capacity building and sustainable livelihood-a study on tribal youths of Odisha
Funding Agency: ICSSR New Delhi

PI: Dr. Pratap kumar Jena, Economics
Title: Climate change and household vulnerability to food insecurity in odisha: A panel data analysis
Funding Agency: Odisha State Higher Education Council
Amount: 3.28 Lakhs

Seminar/Conferences/Workshop Organized

Department	Level National/ International/ State	Category	Title
Material Science	National	Seminar	Science of Engineering Materials
English	State	Seminar	The Novel In Western And South Asian Literatures'
Physics	National	Seminar	Challenges And Prospects In Physics
Odia	State	Seminar	Samrudha Jati Gathana Re Matrubhasa Ra Bhumika
Odia	State	Seminar	Basanta Satpathy Smaraki Alochana Chakra
Odia	State	Seminar	Adhunika Odia GalparaGati O Prakruti