

INDIAN JOURNAL OF NATURAL SCIENCES (IJONS)
BIMONTHLY INTERNATIONAL JOURNAL

Editor-in-Chief
Dr.S.Vijikumar

Published by
TAMILNADU SCIENTIFIC RESEARCH ORGANISATION

39,MURA BHAVAN,KOODAL NAGAR,RAJAGOPALAPURAM POST,
PUDUKKOTTAI, TAMIL NADU, INDIA.

ijonstnsro@gmail.com,editorijons@gmail.com-www.tnsroindia.org.in

Editor-in-Chief, Editorial Board and Publisher take no responsibility for inaccurate, misleading data, opinion and statements appeared in the articles and advertisements published in this journal. It is the sole responsibility of the contributors and advertisers. No part of this journal can be reproduced without the written permission of the Editor-in-Chief who also holds the copyright © of the "Indian Journal of Natural Sciences (IJONS)".

Indian Journal of Natural Sciences (IJONS)

Editorial Committee Members (ECM)

Editor-in-Chief	Dr.S.Vijikumar Director TamilNadu Scientific Research Organisation Pudukkottai-622003, Tamil Nadu. India.
	Editorial Committee
Honorable Chief Advisor	Prof. Dr. V. Ramaiyan Marine Biologist Research Advisor Sri Venkateswara College of Arts & Science. Peravoorani, Thanjavur. Tamil Nadu. India.
Honorable Chief Advisor	Prof.Dr.A.Ganapathi Hon'ble Vice Chancellor, Bharathiyar University, Tiruchirappalli. Tamil Nadu. India.
Honorable Chief Advisor	Prof.Mahdi Vatan Parast Chancellor & Professor, Islamic Azad University, Quchan Branch,Quchan-Khorasan Razavi- Iran.
Honorable Chief Advisor	Prof.Dr.Hamid Saremi Vice- Chancellor, Islamic Azad University, Quchan branch, Quchan-Iran.
Honorable Chief Advisor	Dr. Sr.D.Victoriya Amalorpava Mary , FBS Principal, Bon Secours College for Women, Vilar bypass road, Thanjavur - 613 006. Tamilnadu, South India.
Honorable Member	Dr. N. Jayabalan Professor & Head, Dept. of plant Science, School of Life Sciences Bharathidasan University, Tiruchirappalli. Tamil Nadu. India.
Honorable Member	Dr. T.S. Saravanan Professor of Biotechnology cum Research Co-ordinator Dr.M.G.R Educational and Research Institute University Periyar E.V.R High Road,Maduravoyal,Chennai-600095.
Honorable Member	Dr.S.P.Subramaniam Asst.Controller of Patents and Designs (Govt.of India) Patent Office,IPR Building,GST Road,Guindy,Chennai 600032
Honorable Member	Er. Abdul Samad. M. Kamdod Assistant Professor,Department of Civil Engineering Bharat Institute of Science & Technology for Women Mangalpally, Renga Reddy Dist. Andhra Pradesh, India

Honorable Member	Dr. Hina kousar Assistant Professor, Department of Environmental Sciences, Kuvempu University, Shankaraghatta, Shivamogga – 577 451, Karnataka ,India
Honorable Member	Mr.B.Rajesh Manager (Tech. Services Env.) Grass Roots Research & Creation India (P) Ltd Noida – 201301,Uttar Pradesh,India
Honorable Member	Mr. K.Ramanathan Head, Department of Bioinformatics, Thanthai Hans Roever College Perambalur, TamilNadu, India.
Honorable Member	Dr. K.Gurunathan Prof & Head, Department of Nano science & Technology, Alagappa University, Karaikudi, TamilNadu, India.
Honorable Member	Dr. Rajashekar O, Patil Assistant Professor, Department of Environmental Management Sant Gadge Maharaj College of Commerce & Economics, Mumbai 400004, India
Honorable Member	Dr.M.Ravichandran Prof.& Head Department of Environmental Management Bharathidasan University, Tiruchirappalli. Tamil Nadu. India.
Honorable Member	Dr.M.Krishnan Prof.& Head,Department of Environmental Biotechnology Bharathidasan University, Tiruchirappalli. Tamil Nadu. India
Honorable Member	Dr.K.Kumarasamy Prof.& Head,Department of Geography Bharathidasan University, Tiruchirappalli. Tamil Nadu. India
Honorable Member	Dr.A.Sathya, Assistant professor – III, School of Civil Engineering, SASTRA University, Thanjavur – 613401, TamilNadu, India.
Honorable Member	Dr.G.G.Hammad Ahmad Shadab Senior Assistant Professor, Department of Zoology Aligarh Muslim University,Aligarh-202002,Uttar Pradesh
Honorable Member	Dr.H.Syed Jahangir Assistant Professor, P.G. and Research Department of Botany Jamal Mohamed College(Autonomous) Trichirappalli-620020,TamilNadu,India.
Honorable Member	Mrs.A.Indumathi Asst.Professor,Department of Biotechnology, Bon Secours College for Women,Vilar bypass road, Thanjavur Tamilnadu, South India

Honorable Member	Dr. P. Santhanam Assistant Professor, Department of Marine Science, School of Marine Sciences, Bharathidasan University, Tiruchirappalli. Tamil Nadu. India
Honorable Member	Dr.B.Parimala Devi Additional Director, Veeramani Mohana Centre for Quality Life Engineering Research, Periyar Maniyammai University, Vallam, Thanjavur, Tamil Nadu. India.
Honorable Member	Dr. M. Lekeshmanaswamy Associate professor PG and Research Department of Zoology Kongunadu Arts and Science College G.N. mills (PO), Coimbatore-641 029, TamilNadu, India.
Honorable Member	Dr. P.Udaya Kumar Principal D.K.T College of Education, 1/341, Near Amaravathipalayam, Peruntholuvu (PO), Tirupur - 641 665, TamilNadu, India.
Honorable Member	Dr.Syed Mohamed Asst. Prof. Dept. of Zoology, Jamal Mohamed College Tiruchirappalli, TamilNadu, India
Honorable Member	Dr. Komalavalli Narayanaswamy Associate Professor, PG and Research Department of Botany H.H. The Rajah's College (Autonomous) Pudukkottai – 622 001, Tamil Nadu, India.
Honorable Member	Mis.S.Muthu Bharathi Asst.Professor, Department of Chemistry, Bon Secours College for Women, Vilar bypass road, Thanjavur Tamilnadu, South India
Honorable Member	Mrs.Sujatha Ilangovan Assistant Professor, Department of Biochemistry Holy Cross College, Tiruchirappalli-620002. TamilNadu, India.
Honorable Member	Dr.C.Kathirvelan Assistant Professor, Department of Animal Nutrition Veterinary College and Research Institute (TANUVAS) Namakkal -637002. TamilNadu, India.
Honorable Member	Professor.G.Ganesan Professor, Department of Mathematics Adikavi Nannaya University, Rajahmundry-533105 Andhra Pradesh, India.

Honorable Member	Mis D.Kalpana Asst.Professor, Department of Chemistry, Bon Secours College for Women, Vilar bypass road, Thanjavur TamilNadu, South India
Honorable Member	Dr.C.Balusami Assistant Professor, Department of Livestock Production and Management College of Veterinary and Animal Sciences Pookode-673576.Kerala, India.
Honorable Member	Dr.P.Kavitha Assistant Professor, Department of Zoology and Biotechnology AVVM Sri Pushpam College (Autonomous) Poondi, Thanjavur, TamilNadu, India.
Honorable Member	Dr.Vasudevan Ayyappan Department of Biology, Delaware State University, Dover, Delaware - 19901
Honorable Member	Mrs.A.Amargeetha Asst.Professor, Department of Chemistry, Bon Secours College for Women, Vilar bypass road, Thanjavur TamilNadu, South India
Honorable Member	Mrs.N.Rajarajeswari Asst.Professor, Department of Physics, Bon Secours College for Women, Vilar bypass road, Thanjavur TamilNadu, South India
Honorable Member	Dr.V. Rajendran Dean i/c Vanavarayar Institute of Agriculture Manakkadavu – 642 103. Pollachi Taluk, TamilNadu, India.
Honorable Member	Dr.C.Thamaraiselvi Assistant Professor, Dept. of Biotechnology Mother Teresa Women's University Kodaikanal-624101, TamilNadu, India.
Honorable Member	Dr. K.Madhava Chetty Plant Taxonomist, Assistant Professor, Department of Botany, SVUCS, S.V. University, Tirupati-517 502, Andhra Pradesh, India.
Honorable Member	Dr.S.Ramesh Kumar Assistant Professor, Department of Horticulture, Vanavarayar Institute of Agriculture, Manakkadavu-642103, Pollachi, TamilNadu, India.
Honorable Member	Dr. S. Balasubramanian Assistant Professor Department of Mathematics, Government Arts College (A), Karur – 639 005, Tamilnadu, India.

Honorable Member	Dr.G. Rubalakshmi D/o V.P. Govindaraj, #3/41, Nanbargal Nagar,Muthukalipatty, Rasipuram TK, Namakkal DT-637401.Tamilnadu,India.
Honorable Member	Mr.Sridhar Ramachandran Assistant Professor, Department of Biological Science, Gojan College of Teacher Education , Chennai-600 052, TamilNadu, India
Honorable Member	Dr. H. Krishna Ram #11, 1st Main, Opp. to SBM, Gnanaganaganagar,Bangalore- 560 056, Karnataka, India.
Honorable Member	Dr.S.Senthil Murugan Assistant Professor, Department of Animal Nutrition, College of Veterinary and Animal Sciences, Pookode, Wayanad, Kerala, India.
Honorable Member	R.Muthukrishnan Assistant Professor Department of Soil Science and Agricultural Chemistry Vanavarayar Institute of Agricultural Manakkadavu, Pollachi-642- 103, TamilNadu, India
Honorable Member	K.Ashokkumar Senior Research Fellow Dept of Agricultural Microbiology, Tamil Nadu Agricultural University, Coimbutore-3, TamilNadu, India
Honorable Member	Dr.Subbiah poopathi Scientist-F/Deputy-Director Vector control Research Centre, Medical complex, Indira Nagar,Pondicherry-605006,India
Honorable Member	Dr. Sivalingam Elayabalan Assistant professor 3/33,Eachampatti village Attur(Tk),Salem(Dt)-636107, TamilNadu, India
Honorable Member	Dr. Horne Iona Averal Associate professor of Head Holy cross college (Autonomous), Trichy. TamilNadu, India
Honorable Member	Dr.G.Singaravelu Professor &Head Department of Education Bharathiar University Coimbatore-46 TamilNadu, India
Honorable Member	Dr.Ga.Bakavathiappan Associate Professor in Zoology SBK College, Aruppukottai - 626 101, TamilNadu, India.

Honorable Member	Dr.P.Govindaraj Head & Associate Professor in Chemistry Department of Chemistry SBK College, Aruppukottai - 626 101, TamilNadu, India
Honorable Member	Dr.M.Gopikannan Senior Research Fellow, 15-B3 Paramathi Main Road, S.P.Pudhur, Namakkal(Dt)-637 001, TamilNadu, India
Honorable Member	Dr.K.Samiayyan Dean Agricultural College and Research Institute, TNAU, Eachangkottai, Thanjavur-614902, T.N,India.
Honorable Member	Dr.M.Vasanthi Assistant professor Periyar Illam,(upstairs), No,4,Vayalur Road, Kumaran Nagar, Ramalinga nagar south Extension, Trichy-620017, Tamil Nadu, India
Honorable Member	Dr.N.Vijayakumar Assistant Professor Dept.of Biochemistry & Biotechnology Annamalai University, Annamalainagar-608 002, Tamilnadu, India.
Honorable Member	Dr. S. Umamaheswari Assistant Professor Department of Environmental Biotechnology School of Environmental Sciences Bharathidasan University Tiruchirappalli – 620 024, Tamil Nadu
Honorable Member	Dr. Jai Shanker Pillai H.P. H.D. Ponna swamy Pillai # 644, Ganesh Temple Street Hunsur taluk, Mysore district – 571105, Karnataka, India
Honorable Member	Mr. Nesarajan. J Assitant Professor, Department of Zoology, Bishop Heber College, Trichy-17, Tamil Nadu. India
Honorable Member	Dr. John Abraham Assistant Professor, Department of L.P.M. College of Veterinary and Animal Sciences Pookode, Wayanad. 673576, Kerala.
Honorable Member	Dr. S. Jayachandran Professor &Head,Dept. of Oral Medicine and Radiology, Tamil Nadu Govt. Dental College and Hospital, Chennai -600003,Tamil Nadu,India.

Honorable Member	Dr.V.M. Srinivasan Assistant Professor (Plant Pathology) Department of Crop Protection Thanthai Roever Institute of Agriculture and Rural Development, Valikandapuram Post, Perambalur - 621115., Tamil Nadu.
Honorable Member	Dr.Ranjith.D Assistant Professor, Department of Veterinary Pharmacology and Toxicology, College of Veterinary and Animal Sciences, Pookode, Wayanad – 673576. Kerala,India
Honorable Member	Daniel Jebaraj,M. C/o Joshuaah No.14A, Thendral Nagar New Thillai Nagar, Vadavalli, Coimbatore-641041,TamilNadu,India
Honorable Member	Dr.Sindhu. K Veterinary Officer Department of AH and VS Karnataka, India.
Honorable Member	Dr.Rajesh R Young Scientist, Department of Agricultural Microbiology, Tamil Nadu Agricultural University, Coimbatore 641 003,TamilNadu,India.
Honorable Member	Dr.Jaivel N Post Doctoral Fellow, Department of Agricultural Microbiology, Tamil Nadu Agricultural University, Coimbatore - 641 003,TamilNadu,India.
Honorable Member	Dr.R.Prabhu Research Associate, NADP Cell,CARDS, TamilNadu Agricultural University, Coimbatore - 641 003,Tamil Nadu, India.
Honorable Member	Dr.M.Uma Gowri Research Associate, NADP Cell,CARDS, TamilNadu Agricultural University, Coimbatore - 641 003,Tamil Nadu, India.
Honorable Member	S.Jegan Karuppiah Assistant Professor, Department of Rural Development Science, Arul Anandar College, Karmathur - 625 514, Madurai. Tamilnadu, India
Honorable Member	Dr. Rina Poonia Associate Professor, Department of Physical Education, Faculty of Arts & Law, Manipal University, Jaipur, India.

Honorable Member	Dr.S.Ezhil Vendan Scientist Fellow, Food Protectants & Infestation Control Department, CSIR-Central Food Technological Research Institute, Mysore-570 020,Karnataka,India.
Honorable Member	Dr.K.Shameem Rani Associate Professor and Head, Dept. of Zoology,M.S.S Wakf Board College, Madurai-625020,TamilNadu,India.
Honorable Member	Dr.B.Nagarathnam No.2, New Agraharam, Erode-638001, TamilNadu,India.
Honorable Member	Dr.P.Balaji Assistant Professor (Agricultural and Rural Management), Centre of Excellence in Biofuels, Forest College and Research Institute, Tamil Nadu Agricultural University(TNAU), Mettupalayam- 641 301, Coimbatore Dt., Tamil Nadu.
Honorable Member	Dr.M.Shanthasheela Assistant Professor (Agricultural Extension), Department of Sericulture,Forest College and Research Institute, Tamil Nadu Agricultural University(TNAU), Mettupalayam- 641 301, Coimbatore Dt. Tamil Nadu.
Honorable Member	Dr. N. Balakrishnan Young Scientist, Department of Nano Science &Technology, Tamil Nadu Agricultural University, Coimbatore – 641003, TamilNadu,India.
Honorable Member	Dr.N.Raman Associate Professor, Department of Chemistry, VHNSN College, Virudhunagar-626 001, TamilNadu,India.
Honorable Member	M.Thenmozhi Assistant Professor (Agrl. Engg.), Imayam Institute of Agriculture and Technology, Kannanur, Trichy - 621206, TamilNadu,India.

Honorable Member	K.Kalidas Assistant Professor & Head, Dept. of Social Science, Vanavarayar Institute of Agriculture, Manakkadavu, Pollachi, TamilNadu,India.
Honorable Member	Dr.M.Kumar Assistant Professor(Horticulture), Vanavarayar Institute of Agriculture, Manakkadavu,Pollachi, Coimbatore-642103, TamilNadu,India.
Honorable Member	Dr.T.Pradeesh Kumar Assistant Professor (Agronomy), Vanavarayar Institute of Agriculture,TNAU,Pollachi, Coimbatore-642103,TamilNadu,India.
Honorable Member	Dr.M.R.Nandhakumar Assistant Professor (Agronomy), Kumaraguru Institute of Agriculture (Affiliated to TNAU), Appakoodal,Erode-638315, TamilNadu,India.
Honorable Member	Dr.R.Govindan Assistant Professor (Agronomy), Kumaraguru Institute of Agriculture (Affiliated to TNAU), Appakoodal,Erode-638315, TamilNadu,India.
Honorable Member	Dr.K.Vinoth Kumar Research Associate, Department of Agronomy, Agricultural College and Research Institute, TNAU, Madurai – 625104, TamilNadu,India.
Honorable Member	Dr.S.Sandhya Professor and Head of Department, Department of Pharmacognosy, St.James College of Pharmaceutical Sciences, Chalakkudy, Thrissur,Kerala,India.
Honorable Member	Dr.P.Anbarasan Assistant Professor (Agricultural Extension), Kumaraguru Institute of Agriculture,Tamil Nadu Agricultural University,Sakthi Nagar, Erode-638315, Tamil Nadu, India.
Honorable Member	Dr.N.Muthuselvan Principal, Saiva Bhanu Kshatriya College, Aruppukottai, Virudhunagar, TamilNadu, India.

Honorable Member	Dr.M.Rajasekar Research Associate, Precision Farming Development Center, Agricultural Engineering College and Research Institute, Tamil Nadu Agricultural University, Coimbatore, TamilNadu,India.
Honorable Member	Dr.A.Dinakara Rao Associate Professor, Center for Bioinformatics,School of Life Sciences, Pondicherry university,Puducherry,India
Honorable Member	Dr.K.Sivakumar Associate Professor, Department of Botony,Annamalai University, Annamalai Nagar,TamilNadu,India
Honorable Member	Dr.S.Moghana Lavanya Assistant Professor,Department of Agricultural Economics, Agricultural College and Research Institute, TamilNadu Agricultural University, Madurai,TamilNadu,India.
Honorable Member	Dr.M.Biruntha Assistant Professor, Department of Animal Health and Management, Alagappa University,Karaikudi,TamilNadu,India
Honorable Member	Dr.K.Saravanan Assistant Professor ,PG & Research Dept. of Zoology, Nehru Memorial College (Autonomous), Puthanampatti,Tiruchirappalli TamilNadu,India.
Honorable Member	Dr.A.Kalyana Sundaram Assistant Professor(Entomology), Agricultural College and Research Institute, Tamil Nadu Agricultural University, Eachangkottai,Thanjavur,TamilNadu,India.
Honorable Member	Sirajuddin M.Horaginamani Principal, Sayyid Akbar Husayni Degree College of Arts,Commerce and Science,Kalaburagi,Karnataka,India.
Honorable Member	Dr.P.Ramachandran Director & Head, Trichy Institute of Regenerative Medicine, Thillai Nagar West,Trichy,TamilNadu,India.
Honorable Member	Dr.S.Lingathurai Assistant Professor,Department of Biotechnology, The Madura College, Madurai, TamilNadu,India.

Honorable Member	Dr.P.Manonmani Assistant Professor,Department of Life Sciences, Centre for Research and Development, PRIST University, Vallam, Thanjavur TamilNadu,India.
Honorable Member	Dr. Syed Abrar Research Associate, Department of P.G. Studies & Research in Applied Botany, Kuvempu University,Shivamogga, Karnataka,India.
Honorable Member	Dr.V.Violet Dhayabaran Associate Professor ,Department of Chemistry, Bishop Heber College (Autonomous), Puthur, Tiruchirappalli,TamilNadu,India.
Honorable Member	Dr.H.T.Raghavendra Gowda Haluvalli, Opposite Bus stand, Mallalur,Chikamagalore, Karnataka,India.
Honorable Member	Dr. Goverdhan Rathla K. S Assistant Professor,Department of Physics, Government First Grade College, Birur, Kadur Talluk,Chickmagalore District. Karnataka,India.
Honorable Member	Dr.Ananthnag B Lecturer, Department of Environmental Science, Kuvempu University,Shivamogga, Karnataka,India.
Honorable Member	Dr.M.Ramesh Associate Professor, Department of Biotechnology,Alagappa University, Karaikudi-630003,Sivagangai Dt, TamilNadu,India.
Honorable Member	Dr.S.Yamini Sudha Lakshmi Assistant Professor, Department of Medical Biochemistry, University of Madras,Taramani Campus, Chennai-600113,TamilNadu,India.

Indian Journal of Natural Sciences (IJONS)

Volume V(7)	February 2017
CODEN: IJONS (40) (2017)	ISSN: 0976 - 0997
Issue 40	

S. No.	CONTENTS	Page No.
	Editorial	
1	Unlocking the Potential of Rainfed Agriculture: A Case of North Western Regions of Tamil Nadu, India. M.S. Raman and K.Chandran	11924-11932
2	Standardization of Bioassay Techniques to Study the Insecticide Resistance in Cotton Jassid, <i>Amrasca biguttula</i> . A.Kalyana sundaram and Balbir Singh Joia	11933-11938
3	Fatty Acid Metabolism in <i>Leptospira</i> a Key to its Pathogenicity and Evasion from Host Immune Response Leading to Prolonged Survival of the Organism. Govindaraju Shruthi, V Balamurugan, Shiva Prasad K, Nanjunda Swamy S and Chandan S	11939-11945
4	A Sociological Studies of Cybercrime and Cyber Security Guidelines. Grace Varghese	11946-11951
5	Detection and Identification of <i>Xanthomonas perforans</i> by Direct Sequencing and <i>in silico</i> Analysis of <i>hrpB</i> Gene. Chandrashekar.S, Umesha.S, Chandan.S and G. Shruthi	11952-11965
6	GC-MS Analysis and Antifungal Potential of <i>Coriandrum sativum</i> L. Seed Essential Oil against Pathogenic Fungi. Ravinder Singh, K.K.Chahal and Amit Kumar	11966-11971
7	Flow – Injection Spectrophotometric Determination of Calcium using Bromopyrogallol Red (BPR) as a Color Agent. Lazgin Abdi Jamil and Sameer Abdul-Rahim	11972-11977
8	Assessment of Water Quality and Organic Pesticides in Gomti River Water at Lucknow, Uttar Pradesh. Hafizurrahman, ZulfiqarAli, Mohd Jahir Khan and Abrar Ahmad	11978-11987
9	Studies on Extraction of Juice from Noni Fruits (<i>Morinda citrifolia</i> Linn.). S.Thirukkumar, P.Vennila, S.Kanchana and T.Uma Maheswari	11988-11994
10	Use Geo Accumulation Index and Enrichment Factor in Assessing Pollution in Iraqi Tidal Flats of Some Heavy Metals. Donia K. Kassaf Al-Khuzie, Wesal Fakhri Hassan, Zahraa Al-Hatem, Zuhair Ali Abdulnabi, AlaaAdilMizhir and Hala Ali Shabar	11995-12005
11	Efficacy of Various Antibacterial Chemical against Bacterial Blight of Cluster Bean <i>In vivo</i> Condition. G .L. Kakraliya, A .L. Yadav ² , Sajjan Choudahry , M. K. Jat and Sanju Choudhary	12006-12008
12	Antibacterial Studies of Fruits Extract of <i>Lantana camara</i> L. (Verbenaceae). Zekarias Gebre, Yinebeb Tariku and Venkatesan Jayakumar	12009-12015
13	Effect of Various Neem Based Products and Fresh Cow Dung Suspension against Bacterial Blight of Cluster Bean <i>In vivo</i> Conditions. G .L. Kakraliya, A .L. Yadav, Sajjan Choudahry , M. K. Jat and Sanju Choudhary	12016-12018

14	Effect of Newer Insecticides on Coccinellids Population in Cauliflower Ecosystem. S.K.Dotasara, N.Singh, N.Agrawal, S. Yadav and Kaushal Kishor	12019-12022
15	Organic Meat: A Review. Chetan S Khanapur, Renuka Nayar and Kavitha Rajagopal	12023-12029
16	Variability in Seeds of <i>Argania spinosa</i> according to the Shape and the Geographic Origin of the Fruit. R.Belcadi Haloui, A. Zekhnini, S. El Madidi and A. Hatimi	12030-12038
17	The Rot-Itte Model-Emerging Green Techniques with Airborne Wind Energy. Sayantan Gupta	12039-12050
18	Comparative Assessment of Monoherbal and Polyherbal Creams Incorporated with the Flower Extracts <i>Cassia auriculata</i> L., <i>Chrysanthemum indicum</i> L., <i>Tagetes erecta</i> L. for Acne. Kranthi Kumar, Ranjith D and Sandhya S	12051-12063
19	Determine the Varietal Resistance in Indian Bean, <i>Lablab purpureus</i> (L.) Sweet against Pod Borer Complex. G.C. Jat, V. K. Agarwal and H. L. Deshwal	12064-12069
20	Effect of Duration of Dystocia on Maternal and Fetal Survival Following Caesarean in Crossbred Cows S.Viswanath,V.C.Murthy,A.Krishnaswamy, B.M.Ravindranath, T.G.Honnappa and Narayanaswamy M	12070-12073

Editorial.....

National Science Day 2017...Remember Prof.M.N.Saha....



MEGHNAD SAHA was a great Indian scientist. He made remarkable contribution to the field of Astrophysics. He put forward an "**ionization formula**" which explained the presence of the spectral lines. Meghnad Saha belonged to a poor family and struggled to rise in life. He was born in Seoratali, Dacca district, now in Bangladesh, **on October 6, 1893**. He was the fifth child of his parents, Sri Jagannath Saha and Smt. Bhubneshwari Devi. His father was a petty grocer who barely managed to keep his large family from starvation. Meghnad Saha started his education in the primary school of the village. The nearest such school was in another village about 10 kilometers away. He was lucky in that one Dr. Anantha Kumar Das took an interest in him and offered free board and lodging, so the young Meghnad could go to school. Later in life, he took every opportunity to

express his gratitude to Anantha Kumar Das for this timely help at such a crucial stage, without which his education may never have continued.

Meghnad Saha took admission in the Kishorilal Jubilee School and passed the Entrance examination of the Calcutta University in 1909, standing first among the student from East Bengal obtaining the highest marks in languages (English, Bengali and Sanskrit combined) and in Mathematics. In 1911, he ranked third in the ISc exam while the first position went to another great scientist Satyendranath Bose. After that he took admission in Presidency College Calcutta. In 1913, he graduated from Presidency College with Mathematics major and got the second rank in the first one. In 1915, both S. N. Bose and Meghnad Saha ranked first in M.Sc. exam, Meghnad Saha in Applied Mathematics and S.N. Bose in Pure Mathematics.

In 1917, He started his professional career and joined as lecturer at the newly opened University College of Science in Calcutta. He taught Quantum Physics. Along with S.N. Bose, He translated the papers published in German by Einstein and Hermann Minkowski on relativity into English versions. In 1919, American Astrophysical Journal published – "On Selective Radiation Pressure and its Application" – a research paper by Meghnad Saha. He put forward an "onization formula" which explained the presence of the spectral lines. The formula proved to be a breakthrough in astrophysics. He went abroad and stayed for two years. He spent time in

research at Imperial College, London and at a research at Imperial College, London and at a research laboratory in Germany. In 1927, Meghnad Saha was elected as a fellow of 'London's Royal Society'.

In 1932, Meghnad Saha moved to Allahabad, Uttar Pradesh Academy of Science was established. He returned to Science College, Calcutta in 1938. During this time, Saha got interested in Nuclear physics, which later was named after him as Saha Institute of Nuclear physics in the curriculum of higher studies of science. Having seen cyclotrons used for research in nuclear physics abroad, he ordered one to be installed in the institute. In 1950, India had its first cyclotron in operation. He invented an instrument to measure the weight and pressure of solar rays. He produced the famous equation, which he called 'equation of the reaction-isobar for ionization', which later became known as Saha's "Thermo-Ionization Equation".

Saha was the leading spirit in organizing the scientific societies like the 'National Academy of Science' (1930), 'Indian Institute of Science' (1935), and the ' Indian Association for the Cultivation of science' (1944). The lasting memorial to him is the 'Saha Institute of Nuclear physics' founded in 1943 in Calcutta. He was the chief architect of river planning in India. He prepared the original plan for Damodar Valley Project. Meghnad Saha was an Indian astrophysicist who nominated for the 'Nobel prize' in physics in 1935-36. In 1952, he was elected as a Member of Parliament for the North-West Calcutta constituency. He was an advocate for the peaceful use of nuclear energy and instrumental in the reformation of the Indian calendar. He died on **February 16, 1956**. Saha was the chief architect of river planning in India and prepared the original plan for the Damodar Valley Project.

His student D.S. Kothari was pointed out "*He (Saha) was extremely simple, almost austere, in his habits and personal needs. Outwardly, he sometimes gave an impression of being remote, matter of fact, and even harsh, but once the outer shell was broken, one invariably found in him a person of extreme warmth, deep humanity, sympathy and understanding; and though almost altogether unmindful of his own personal comforts, he was extremely solicitous in the case of others. It was not in his nature to placate others. He was a man of undaunted spirit, resolute determination, untiring energy and dedication*"

On behalf of National Science Day 2017, IJONS and its team salute M.N Saha's intellectual work and also wish the all scientist of our country.

Yours Naturally

S.Vijikumar

Editor in Chief-IJONS

Source :TNSRO Research Library