

Indian Phytopath News

A quarterly Newsletter of Indian Phytopathological Society

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From President's Desk

As President of the Society, I sincerely feel that the research journal, *Indian Phytopathology* has reached to a newer height in recent days due to active role of the Editorial Board and the publisher Springer Nature. The review articles and research papers published in this journal have attracted attention of the scientific



community all around the globe. I would like to quote one instance: one of my review article on mushroom published in the September issue of *Indian Phytopathology* 2018 has impressed the organizer Scholerana, USA and invited me for presentation of my work in the Scon International Conference on "Food Science, Nutrition and Public Health" at Singapore on 27-28th June, 2019.

It was a co-incidence that the General Body and Executive Council of IPS during 70th and 71st Annual Meetings and National Symposia at AAU, Jorhat, Assam and BHU, Varanasi, respectively decided to hold the 7th International Conference of the Society in the year 2020 at IARI, New Delhi which so happened by declaring the United Nation General Assembly to mark 2020 as the International Year of Plant Health. IPS being the third largest society of Plant Pathology in the world has come forward to make use of this biggest platform by organizing 7th International Conference on "Phytopathology in Achieving UN Sustainable Development Goals" from January 16-20, 2020 at IARI, New Delhi. I am very happy to inform all the distinguished members of the Society that IPS along with 12 most prominent plant protection societies within and outside the country have already consented to act as Coorganizers of the conference and probably it would be the first time when all the like-minded societies have come together for celebrating 2020 as the International Year of Plant Health. I would urge each and every member of the Society to please reserve their excellent works for presentation during this international conference. I would also request them to place their critical comments and fruitful suggestions in improving the overall activity of the Society so that the society may really reach its goal for which it was constituted. Continuous contact in sharing the scientific information, innovation, thoughts, views, and best plant pathological practices among our fraternity is the need of the hour which must be continued making use of the ICT tools available with us.

M.P. Thakur President, IPS

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Editorial

Amelioration of abiotic stresses in plants through potential microorganisms

B.N. Chakraborty Chief Editor, IPS Newsletter

Agriculture is one of the most vulnerable sectors encountering abiotic stresses such as drought, flooding, salinity, high and low temperatures, change of pH, exposure to UV light and heavy metals, since it depends on the productivity of crops. Adverse environmental conditions have a negative impact on crop



production, which have the potential to become major problems for food security, particularly in tropical regions. There is no doubt that in the current agricultural scenario, threats to crop production from abiotic stresses continue to rise. Besides natural changes in environmental conditions, the most compounding factors are population explosion and human activities. Abiotic stress management is one of the greatest challenges for agricultural scientists and hence needs careful consideration.

Various strategies to cope with abiotic stresses include development of heat, drought and salt tolerant varieties, shifting of crop calendars as well as resource management practices. Development of stress tolerant plants (STPs) is another option being considered which includes manipulation of stress associated genes and proteins for over expression of metabolites, production of transgenics or conventional plant breeding combined with the use of molecular markers and QTLs. However, though some of these technologies have shown promise, they are costintensive and laboratory oriented which may not be the solution for common farmers.

Another strategy which has high potential to alleviate stresses in plants involves the utilization of multi-faceted traits of beneficial microorganisms - heat stress (Pseudomonas putida strain AKMP7; Bacillus amyloliquefaciens 5113; B. safensis; Azospirillum brasilense NO40; Glomus mosseae; G. aggregtaum, G. etunicatum, Gigaspora margarita); cold stress (Pantoea dispersa, P. fragi, Exiguobacterium acetylicum, P. lurida, Burkholderia phytofirmans strain PsJN); drought and salinity stress (Brachybacterium saurashtrense, Brevibacterium casei, P. putida, Achromobacter piechaudii, B. safensis, Ochrobacterum pseudogregnonense, G. mosseae, G. intraradices, Trichoderma harzianum T-22, T. hamatum DIS-219). Bioformulations of these microorganisms must be made easily available to the farmers as low-input technologies for application in the field. Use of these microorganisms can alleviate adverse effects and stresses caused by the abiotic factors that will result sustainability in agriculture over time.

Research Highlights

Inducing confidence in improved agriculture through bio-resources

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The major constraints of the productivity and area expansion of lentil in West Bengal are cultivation of mostly local/old varieties, non-use of rhizobium and other bio-inoculants, high level of weed infestation and limited option for herbicidal application, lack of awareness on improved package of practices and lack of supply of good varieties with high yield potential befitted with the demand of the region in seed supply chain. Considering all constraints of seed production, participatory research trials were set up by using the promising variety "Maitree" with bioinoculum consortium (Rhizobium, Phosphate solubilizing bacteria and *Trichoderma viride*) as seed dresser and need based application of Trichoderma in 2012-13 at Kalinagar Village of Gazole block in Malda district both under conservation and conventional tillage. The average yield was higher in conservation agriculture (1.82 t/ha) as compared to conventional tillage (1.76 t/ha). However, yield ranged from 1.33 to 2.23 t/ha depending upon the land situation. Rhizobuim (URH 5), PSB (UBPS 9) and *Trichoderma viride* (UBT 18) were isolated and developed locally from lentil, arjun and wheat rhizosphere, respectively under DBT and RKVY projects. The outcome of CA technology made a greater impact on rural youth and women farmers of locality. The area coverage had also increased to a greater extent and almost replaced mustard with lentil in the locality. In reality, acreage under lentil production jumped to about 400 ha in 2016-17 from mere 12 ha in 2012-13 in the locality. The success of CA lentil helped the state government to introduce lentil variety "Maitree (WBL 77)" in different flagship programmes.

Mr. Arun Roy of Kalinagar village is a progressive farmer and always comes forward with innovative ideas. He is the first man to introduce lentil in the locality in 2012-13. He is also involved in good quality seed production using CA technologies. Now, he is earning an additional sum of INR 1,30,000/- per ha through 'seed producing entrepreneurship' in lentil.



Mrs. Jyotsna Roy is a women farmer from the same village engaged as seed grower of lentil with improved packages of practices since 2016-17. She is a poor marginal farmer having 0.67 ha of land. She has a family of three members with her

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disabled husband and unmarried daughter. Under such circumstances she started agripreneur as a lentil seed grower. She could increase lentil yield from 1.02 t/ha to 1.87 t/ha by adopting seed bio-priming and conservation agriculture technology. Mrs. Roy was successful in this venture and able to generate income up to INR 75,000/ha that helps to support her family.

Now, hundreds of farmers in the neighbouring villages are motivated towards the improved agro-technologies.



Farmers received payments for seed production from West Bengal State Seed Corporation Ltd.

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Incidence of canna rust caused by *Puccinia* thaliae from Tripura

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Canna indica is a perennial, beautiful flowering plant which grows wildly in different parts of North-East India. The plants were found infected with canna rust caused by Puccinia thaliae from Tripura-West District. The disease severity was estimated to be 36.3 %. Infected leaves were covered with numerous small, yellow, irregularly shaped, powdery rust pustules. Orange rusty pustules develop primarily on the lower surface of leaves, with corresponding 1-2 mm-diameter chlorotic lesions on the upper surface. In advanced stages, spots on the upper leaf surface coalesce and turn dark brown. Heavily infected leaves eventually collapse, dried up and die. Numerous golden urediniospores are formed in the uredinia. The urediniospores possess bristly walls which may vary from egg- to pear-shaped and orange in colour. Based on symptomatology and microscopic observation the pathogen is identified as Puccinia thaliae. In the pathogenicity test, rust pustules were developed 15 days after inoculation on the under surface of the leaves bearing typical disease symptoms.



1. Underside of leaf showing orange rusty pustules, 2. Uredinospores

Microneedle technique for quick detection of plant pathogen

Researchers from North Carolina State University have developed a new technique that uses microneedle patches to collect DNA from plant tissues in one minute, rather than the hours needed for conventional technique. The new method holds promise for on-site plant pathogen detection. *Journal Reference*: Rajesh Paul, Amanda C. Saville, Jeana C. Hansel, Yanqi Ye, Carmin Ball, Alyssa Williams, Xinyuan Chang, Guojun Chen, Zhen Gu, Jean B. Ristaino, Qingshan Wei. Extraction of Plant DNA by Microneedle Patch for Rapid Detection of Plant Diseases. ACS Nano, 2019; DOI: <u>10.1021/acsnano.9b00193.</u> (Source: www.sciencedaily.com).

Occurrence of *Phomopsis* sp. on spider plant in Himachal Pradesh

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Chlorophytum comosum, also known as spider plant, St. Bernard's lily, spider ivy, ribbon plant etc. is a beautiful ornamental house plant. This perennial plant with variegated leaves has gained the Royal Horticulture Society's Award of Garden Merit in 2007. It is known for its air purifying ability, so it has found place in hanging type baskets, corner type shelf or tables in houses. Recently, dark pink to magenta coloured spots were observed affecting its long narrow leaves (Fig. 1). The spots later coalesced to form a large coloured patch (Fig. 2).



Microscopic examinations revealed the presence of two types of conidia which appeared to be alpha and beta conidia of *Phomopsis* sp. Alpha conidia were single celled, hyaline and oval to fusoid whereas, beta conidia were single celled, hyaline, long and thin with a characteristic curve or bend (Fig. 3). Associated pathogen was isolated in pure (Fig. 4) form and identified as *Phomopsis* sp. using standard keys.

Training Organized

To develop interest among school students in the world of microorganisms a sensitization programme on "Viewing microorganisms by use of Foldscope" was conducted by Department of Plant Pathology, College of Agriculture, Tripura at Tripureswari Vidya Mandir, Tripura, India on 6th May, 2019. Altogether 50 students participated in the programme.



Seminar/Symposia attended

Dr. M.P. Thakur, Director Instruction & Controller of Examination of Indira Gandhi Krishi Vishwvidyalaya, Raipur, Chhattisgarh, presented Keynote address on "National and International Scenario of Mushroom Research and Innovations in Production and Value Chain Management" in the "International Conference on Innovative Horticulture and Value Chain Management - Shaping Future Horticulture" organized by Swadesh Prem Jagriti Sangosthi at GBPUAT, Pantnagar (Uttarakhand) during May 28-31, 2019. Dr. Thakur chaired a Technical Session on "Recycling of Agrowaste" in All India Seminar on "Waste to Wealth" organized by Institutions of Engineers, Chhattisgarh State Centre, Raipur during June 16-17, 2019. He also presented a keynote address on "Recent Advances in Mushroom Processing, Biofortification and Product Development of Oyster Mushroom" in "SCON International Conference on Food Science, Nutrition and Public Health-2019" organized by Scholarena, Delaware, USA at Park Hotel Clarke Quay, Singapore during June 27-28, 2019.



Mohamad Hussam Halabi, a Ph D scholar of the Department of Plant Pathology, Assam Agricultural University, Jorhat, Assam was invited for an oral presentation of his research paper entitled "Molecular Identification and Prevalence of Potato Viruses in North-Eastern States of India" at

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the 17th Triennial meeting of the Virology Section of the European Association of Potato Research (EAPR) combined with 10th Annual meeting of PVY organization at Laulasmaa, Estonia from June 18-21, 2019. He was provided with an assistance of Euro 550.00 for registration and accommodation by the EAPR. Mohamad Hussam, a Syrian scholar under Indian Council of Cultural Relation fellowship programme, is currently pursuing research work under the supervision of Dr. Palash Deb Nath, Professor, College of Agriculture, AAU, Jorhat, Assam, India.

INDIAN PHYTOPATHOLOGICAL SOCIETY, NEW DELHI 7th International Conference Phytopathology in Achieving



Forth-coming Events

- IPS 7th International Conference 2020: The Indian Phytopathological Society (IPS) is organizing 7th International Conference on "Phytopathology in Achieving UN Sustainable Development Goals" at ICAR-IARI, New Delhi during January 16-20, 2020.
- XIX International Plant Protection Congress (IPPC 2019): The IPS is organizing a half day technical session on the topic "Detection and diagnosis of plant pathogens: DNA barcoding" in association with the XIX International Plant Protection Congress (IPPC 2019) i.e. International Association for the Plant Protection Sciences (IAPPS), ICRISAT and the Crop Protection Societies in India, at International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) during November 10-14, 2019 at Hyderabad, Telangana, India (http://www.ippc2019.icrisat.org).
- 6th Asian PGPR International Conference: Asian PGPR Society for Sustainable Agriculture is organizing 6th Asian PGPR International Conference (6th APGPR 2019) during August 18-22, 2019 in Tashkent, Uzbekistan. The IPS is also one of the Co-organizer of the Conference (http://asianpgpr2019.com).
- IPS Zonal Chapter Meeting and Symposium 2019-20
- Southern Zone: Topic: Transdisciplinary Plant Pathological Research The Way Ahead; Venue: Agricultural Extension Education Centre (UAS, Raichur), Koppal, Karnataka; Date: Nov. 28-29, 2019 (Contact: Dr. M.B. Patil (ZP), patilmb_65@yahoo.com; Dr. Y.S. Amaresh (ZC), ysama2008@rediffmail.com)
- Western Zone: Topic: Emerging Trends in Plant Pathology under Climate Change Scenario; Venue: Mahatma Phule Krishi Vidyapeet, Rahuri, Ahmednagar, MS; Date: Between 1 to 9th Sept., 2019 (Contact: Dr. C.D. Deokar (ZP), cd_deokar@rediffmail.com; Dr. V.K. Bhalerao (ZC), vkb145@gmail.com)
- Eastern Zone: Topic: Mitigating biotic stresses in agriculture for 21st Century: Changing Market Paradigm; Venue: Uttar Banga Krishi Viswavidyalaya, Coochbehar, WB; Date: Nov. 5-6, 2019 (Contact: Dr. P.M. Bhattacharya (ZP), pmbubkv2012@gmail.com; Dr. Ayon Roy (ZC), ayonroy.plantpathology@gmail.com)
- North Eastern Zone: Topic: Sustainable Plant Health Management in North-east India; Venue: ICAR Research Complex for NEH Region, Umiam, Meghalaya; Date: Nov. 7-8, 2019 (Contact: Dr. Pankaj Baiswar (ZP), pbaiswar@yahoo.com; Dr. Tasvina R. Borah (ZC), tasvinaborah@gmail.com)
- Delhi Zone: Topic: Bio-intensive Approaches for Management of Crop Diseases; Venue: Division of Plant Pathology, IARI, New Delhi; Date: Nov. 23, 2019 (Contact: Dr. M.S. Yadav (ZP), dr.msyadav65@gmail.com; Dr. Nasim Ahmad (ZC), nasimnc@gmail.com)
- Mid-Eastern Zone: Topic: Plant Health Management for Eco Friendly and Sustainable Agriculture; Venue: CSA University of Agric. & Tech., Kanpur, UP; Date: Nov. 6-8, 2019 (Contact: Dr. Ved Ratan (ZP), vedratancsau@gmail.com; Dr. U.K.Tripathi (ZC), pclinseed@gmail.com)
- Central Zone: Topic: Challenges and Opportunities in Plant Pathology; Venue: Andhra University, Visakhapatnam, A.P.; Date: Dec. 11/12, 2019 (Contact: Dr. T.S.S.K. Patro (ZP), drsamuelpatro@gmail.com; Dr. P.K. Varma (Z C), penumatsakishore@gmail.com)
- Northern Zone: Topic: Plant Disease Management for Food Security Under Climate Change Scenario; Venue: CCS HAU, Hisar, Haryana; Date: Dec. 12-13, 2019 (Contact:Dr. Rakesh Mehra (ZP), rmehra1354@gmail.com; Dr. P.L. Kashyap (ZC), plkashyap@gmail.com)

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Awards/Honours

Dr. A.K. Misra, former Project Coordinator, AICRP on Subtropical Fruits and Head, Division of Crop Protection, CISH, Lucknow and former President of Indian Phytopathological Society was conferred with "Life Time Achievement Award" for his significant contributions and commitment to furtherance in the field of eco-friendly agriculture in the International Conference on Sustainable Organic Horti-Agriculture System by Doctor's Agriculture and Horticulture Development Society, Lucknow during Nov. 28-30, 2018 at Lucknow. He was also conferred with "Dr. Panjab Singh Distinguished Scientist Award-2017" by U.P. Academy of Agricultural Sciences, Lucknow on the occasion of 30th foundation day of U.P. Council of Agricultural Research, Lucknow on 14th June, 2019.



Dr. Rashmi Aggarwal, Head and Principal Scientist, Division of Plant Pathology, ICAR-Indian Agricultural Research Institute, New Delhi awarded with NAAS Fellow in Plant Protection Section 2019.



Dr. B. Parameswari, Senior Scientist (Plant Pathology) from ICAR-Sugarcane Breeding Institute Regional Centre, Karnal awarded with NAAS Associate from 1st January 2019.



 Dr. M.P. Thakur, Director Instruction & Controller of Examination of Indira Gandhi Krishi Vishwvidyalaya, Raipur, Chhattisgarh, received "All India Above and Beyond Award 2018" for his outstanding contributions in the field agricultural and allied fields by Society for Advancement of Human and Nature (SADHNA), Dr. Y.S.



Parmar University of Horticulture and Forestry, Nauni, Solan (H.P.). The award was given during National Seminar on "Doubling Income through Sustainable and Holistic Agriculture (DISHA) during June 5-7, 2019 at Nauni, Solan (Himachal Pradesh).

 Dr. Shamarao Jahagirdar, Professor (Plant Pathology) & National PI (Soybean Pathology), Department of Plant Pathology, UAS, Dharwad received "Fellow of Society for Plant Research (FSPR)-2018" in the National Seminar on "Current Interventions to Plants and Microbes for



Environment and Agricultural Sustainability" held at Guru Nanak Dev University, Amritsar during March 6-7, 2019. He also received "National Achiever Award-2018" from Society for Advancement of Human and Nature (SADHNA) and recognized with Honorary Life Member of Board and Society during National Symposium on "Doubling Income through Sustainable and Holistic Agriculture" held at Dr. YSPUHF, Nauni, Solan, HP during June 5-7, 2019.

 Dr. Pramod Kumar Gupta, Scientist, Plant Pathology, JNKVV, Jabalpur Madhya Pradesh, received Young Scientist Award for the recognition of outstanding contribution in Farm Advisory Services under Transfer of Technology and Participatory research in



the International Conference on "Food Security Through Agriculture & Allied Science (FAAS-2019)" held at Tribhuvan University, Kathmandu, Nepal during May 27-29, 2019 in jointly organized by the Society for Agriculture Innovation & Development, Ranchi, India.

 Dr. K. Sesha Kiran, Asst Professor & Head, Department of Plant Pathology, Dr. YSRHU, West Godavari Dt, Venkataramannagudem, Andhra Pradesh, was selected for Science Academies Summer Research Fellowship Program (SRFP-2019) by INSA, New Delhi, IAS, Bangalore and NASI, Prayagraj to work



at National Institute of Plant Genome Research, New Delhi under the guidance of Dr. Debasis Chattopadhyay for a period of 8 weeks (June 03, 2019 to July 28, 2019).

 Miss Parinda Barua, Ph.D. Scholar, Department of Plant Pathology, AAU, Jorhat, Assam, has been awarded "Best Master Thesis award-2019" by the Agricultural Technology Development Society (ATDS) in the 3rd International Conference on "Global Initiatives in Agricultural and Applied



Sciences for Eco Friendly Environment (GIASE-2019)" held at Kathmandu, Nepal, during June 16-18, 2019 for her thesis on "Molecular characterization of isolated bacteriophages of Pseudomonas savastanoi pv. savastanoi". Ms Barua received the Erasmus Mundus BRAVE fellowship and carried out her research in Agricultural University of Athens and University of Thessaly, Greece under the supervision of Dr. Palash Deb Nath, Department of Plant Pathology, College of Agriculture, AAU, Jorhat, Assam, India (Major Advisor, India) and Dr. Andreas Voloudakis, Agricultural University of Athens, Athens (Advisor, Greece) and Dr. Evangelos Vellios, Asst. Prof., University of Thessaly, Volos, Greece (Advisor, Greece).

Call for IPS Awards 2020

Applications for the following IPS awards (2020) are invited by the Society and the last date to receive the applications is July 31, 2019. The details are available on IPS website: http://ipsdis.org/guidelines

- 1. Mundkur Memorial Award
- 2. M.S. Pavgi Memorial Award
- 3. M.K. Patel Memorial Young Scientist Award
- 4. J.F. Dastur Memorial Award
- 5. J.P. Verma Memorial Award
- 6. ShardaLele Memorial Award
- 7. K.C. Mehta and Manoranjan Mitra Award
- 8. S. Sinha Memorial Award
- 9. B.N. Chakraborty and Usha Chakraborty IPS Best **Teacher Award**
- 10. Fellow of Indian Phytopathological Society (FPSI)

New Positions

Dr. Pranjib K. Chakrabarty joined Agricultural Scientists Recruitment Board as Member (Plant Sciences) on April 16, 2019. Before joining ASRB, he served ICAR, New Delhi as Assistant Director General (Plant Protection & Biosafety) since October 7, 2013. He also held additional



charges of ADG (Commercial Crops) from June 2015 -February 2016, ADG (Oilseeds and Pulses) from August 2017 - April 2019, Project Coordinator (Honey bees & Pollinators) from October 2017- March 2019 and PC (Nematodes) from November 2018 - April 2019.

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Editorial Board - Newsletter



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