



# Indian Phytopath News

A quarterly Newsletter of Indian Phytopathological Society

<http://ipsdis.org/>

Volume 6 • Issue 3-4 • July - December 2023

## From President's Desk

### Maximum residue limit of pesticides: Opinions and view points

Agricultural commodities are susceptible to various insect-pests and diseases which are causing substantial crop production loss globally. In such conditions, pesticides have proved to be one of the most effective instruments in protection of food crops from pests and diseases as well as improving crop yield. However, there have been instances when pesticide residues have found their way to the consumer plate leading to food safety concerns as well as creation of trade barriers. Besides harmfully impacting the quality and nutritional contents of cereals, pulses, vegetables and dairy products, the irrational application of pesticides contaminates soil, water and air too.



Presence of pesticide residues in food commodities beyond permissible limits is usually observed due to the non-judicious use of pesticides. Implementation of Good Agriculture Practices (GAP) by farmers ensures that the food produced is safe for consumers. Maximum Residue Limit (MRL) is the highest level of pesticide residue legally permitted in a food commodity or feed which are established by the regulatory bodies of the respective countries based on their Good Agricultural Practices (GAP) considering the toxicity of the pesticides. Since countries set their own MRLs, it has been observed that MRLs of different countries remain largely non-harmonized. The variation in MRLs of the same pesticide-crop combinations in the country of import and export, tend to give rise to trade barriers that impede smooth trade.

Internationally, the Codex Alimentarius Commission (CAC), which is an international food standards body established jointly by the Food and Agriculture organization (FAO) and the World Health Organization (WHO) is responsible for establishing

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Codex Maximum Residue Limits (CXLs) for pesticide residues in food items or in groups of food or feed that move in international trade based on risk assessment. The Agreement on Application of Sanitary and Phytosanitary Measures (SPS) of the World Trade Organization (WTO) recognizes Codex standards, guidelines, and recommendations as reference standards for international trade and trade dispute settlement. Unnecessary non-tariff trade barriers may be avoided globally if countries align their MRLs with Codex.

Keeping in view the challenges associated with consumer safety and export of agricultural commodities including spices from India, the ICAR- All India Network Project on Pesticide Residues (AINP-PR) has established linkages with the FAO/ WHO/ Joint Meetings on Pesticide Residues (JMPR) and Codex Committee on Pesticide Residues (CCPR) for the fixation of Codex MRLs on spices. The pesticide residue monitoring data generated by AINP-PR on various spices as part of Monitoring of Pesticide Residue at National Level (MPRNL) project is being regularly submitted to FAO/WHO/JMPR for risk assessment and fixation of Codex MRL. Up till now, Codex MRLs for 20 pesticide-spice combinations on five different spices (cardamom, coriander, fennel, cumin, pepper (black and white) has been fixed based on the data submitted by India. This would ease trade barriers between countries and facilitate smooth export of spices from India.

India needs to have a national level coordination committee consisting of members from ICAR, MoA, FSSAI, major exporter groups like APEDA and Association of pesticide industries to determine the national priorities in respect of MRLs. India must develop data base on National Registration of Pesticides to support the periodic review of unsupported compounds with no public health concern and which are not supported by the manufacturer. Crop grouping in harmonisation with Codex crop groups in Indian context has to be finalized to bring more pesticide label claims for farmers in the country.

**S.C. Dubey**

President

Indian Phytopathological Society, New Delhi

## Research Highlights

### Genome sequence of *Tilletia caries* inciting common bunt of wheat provides pathogenicity-related genes

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Common bunt of wheat caused by *Tilletia caries* is an important disease worldwide. The *T. caries* genome was sequenced. The assembly size of 38.18 Mb was generated with a GC content of 56.10%. Forty-six contigs were obtained with N50 of 1,798,756 bp. In total, 10,698 genes were predicted in the assembled genome. Out of 10,698 genes, 10,255 genes were predicted significantly in the genome. Molecular function, cellular components, and biological processes for predicted genes were mapped into the genome. In addition, repeat elements in the genome were assessed. In all, 0.89% of retroelements were observed, followed by long terminal repeat elements (0.86%) in the genome. In simple sequence repeat (SSR) analysis, 8,582 SSRs were found in the genome assembly. The trinucleotide SSR type (3,703) was the most abundant. Few putative secretory signal peptides

and pathogenicity-related genes were predicted. The genomic information of *T. caries* will be valuable in understanding the pathogenesis mechanism and management. (*Front. Microbiol.* 14:1283613. doi: 10.3389/fmicb.2023.1283613)



Fig. 1. Common bunt of wheat and culture of *Tilletia caries*

### Disruptive bio-control technology for eco-friendly management of *Fusarium sacchari* causing sugarcane wilt

Sanjay Kumar Goswami\*, Ranjit Singh Gujjar, Rajeev Kumar, Chandramani Raj and Shweta Singh, Dinesh Singh and Rasappa Viswanathan

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Sugarcane (*Saccharum officinarum* L.) is an economically important cash crop in India. The crop is a main source of sugar along with important by-products like bio-ethanol, jaggery, fibre, fodder, bagasse and molasses. The crop contributes approximately 80% of global sucrose annually. Sugarcane is affected by many fungal diseases *i.e.* red rot, pokkah boeng, smut and wilt. Among them, wilt caused by *Fusarium sacchari* is a destructive disease. The disease causes significant loss in sugarcane quantity and quality. Under *in vitro* and *in planta* assay, an eco-friendly bio-control technology had been developed for the management of the wilt. Dual culture assay showed that *Trichoderma harzianum* strain TRSR-4 inhibited colony diameter of *F. sacchari* (90.60%) than untreated control (Fig. 1). The

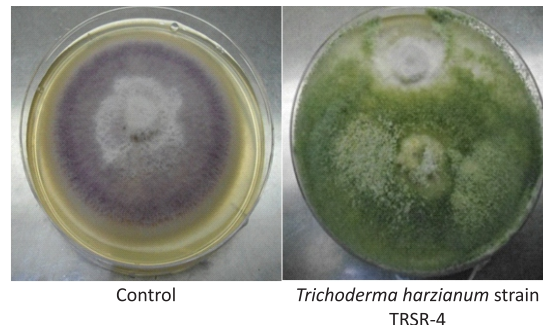


Fig. 1. *In vitro* bio-control of sugarcane wilt caused by *Fusarium sacchari*



sugarcane susceptible var. Co-7717 setts were treated with *Trichoderma harzianum* strain TRSR-4 (Conc.  $2 \times 10^6$ ) for 10 min and planted in pots containing compost and soil (1:5). After 48 hrs, the pots were soil inoculated with *Fusarium sachhari* ( $1.5 \times 10^6$ ). *In planta* assay under polyhouse conditions showed 51.67% decrease in wilt than untreated control (Fig. 2).

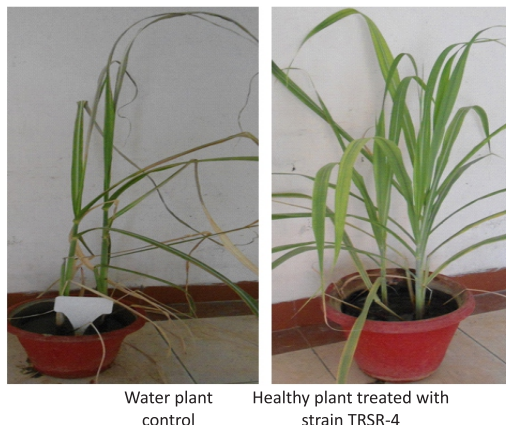


Fig. 2. *In planta* bio-control of sugarcane wilt caused by *Fusarium sachhari*

### Evaluation of PGP traits and *in-vitro* antagonism of endophytic *Chaetomium* sp. against soil borne fungal pathogens of chickpea

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Medicinal plants enjoyed the highest reputation in the indigenous system of medicine all over the world and still modern as well as traditional system of medicine relies on these sources. In the present study, endophytic *Chaetomium* sp. isolated from healthy leaves of black tulsii (*Ocimum basilicum*) was studied for its plant growth promoting traits and antagonism against soil borne fungal pathogens of chickpea. In the dual culture assay, *Chaetomium* sp. was tested against three soil borne fungal pathogens of chickpea, viz., *Macrophomina phaseolina*, *Fusarium solani* and *Sclerotium rolfsii* in which the endophyte showed a significant growth inhibition against *F. solani* and *M. phaseolina* (Fig. 1). The fungus gave a positive reaction for production of IAA, ammonia, cellulase and amylase under *in-vitro* conditions whereas phosphorous solubilisation and laccase production was not found. Through this study, it can be concluded that endophytic *Chaetomium* sp. has a role in both plant growth promotion as well as disease management and can be used as a potential biocontrol agent in future.

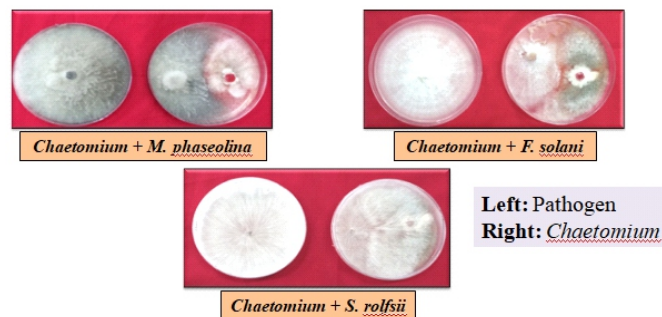


Fig. 1. Dual culture assay of *Chaetomium* sp. against soil borne pathogens of chickpea

## Awards/Honours

- **Dr. N.M. Gohel**, Associate Professor, Department of Plant Pathology, B.A. College of Agriculture, AAU, Anand received the “Best Teacher Award” on the occasion of 1<sup>st</sup> International Agricultural Conference on “Natural Vs Organic Farming: In Context to Bhartiya Agriculture” jointly organized by World’s First Gujarat Natural Farming Science University (GNFSU), Anand; Hindustan Agricultural Research Welfare Society and IIMT University, Meerut during 24-26 December, 2023.

## IPS Zonal Symposia 2023-24

### IPS Southern Zone Symposium

ICAR-Central Tuber Crops Research Institute, Thiruvananthapuram, Kerala along with Indian Phytopathological Society (SZ), hosted a significant event, the “National Symposium on Plant Health Management: Current Trends and Novel Mitigation Strategies”, which was officially inaugurated by University of Kerala Vice Chancellor Dr. Mohanan Kunnummal today. In the presidential address Dr. G. Byju, Director, ICAR-CTCRI. said that climate change is the hindering factor to achieve targets of agriculture, plant health is related with human health, animal health and soil health. Dr. Kajal Kumar Biswas, Secretary, IPS, Dr. Bikash Mandal, ADG, International Relations, ICAR, New Delhi, Dr. S.K. Chakrabarti, former Vice Chancellor of UBKV, West Bengal, and Sh. S. Premkumar, General Manager of Canara Bank, Thiruvananthapuram Circle were present and delivered special addresses. They shared their valuable insights and experiences related to plant health management and its impact on agriculture in India.

Approximately, 150 delegates from various parts of India, reflecting the significance and interest in the field of plant health management in the country. This event will provide a platform for researchers, experts, and stakeholders to exchange ideas and collaborate on innovative strategies to ensure the health and productivity of crops in India. The various sessions of the seminar includes the status and future avenues of the role of beneficial microbes in plant health management, diagnostics in plant health management, innovative approaches in plant health management, climate resilient agriculture and forecasting, and emerging areas in plant pathology.

Dr. T. Makesh Kumar, President of the Indian Phytopathological Society (Southern Zone) and Head of the Division of Crop Protection welcomed the gathering and Dr. S.S. Veena, Councillor of the Indian Phytopathological Society (Southern Zone) and Principal Scientist of the Division of Crop Protection proposed the vote of thanks.

### IPS Eastern Zone Symposium

National Conference on “Novel Strategies and Advances in Crop Health Management: Towards Technology-driven Eco-friendly Solutions” was held in Odisha University of Agriculture and Technology (OUAT), Bhubaneswar, Odisha during December 12-14, 2023. The Conference is jointly organized by Indian Phytopathological Society-Eastern Zone, Central Horticultural Experiment Station (ICAR-Indian Institute of Horticultural Research), Bhubaneswar, and Odisha University of Agriculture and Technology (OUAT), Bhubaneswar.

### IPS North-Eastern Zone Symposium

IPS North-Eastern Zone Symposium (Virtual mode) on “Plant Disease Management for Sustainable Crop Production” during December 8-9, 2023 was held at Department of Plant Pathology, College of Agriculture, Central Agricultural University, Imphal. The inaugural session of the IPSNEZ was held on 8<sup>th</sup> December 2023. Dr. Gopal Kumar Niroula Chhetry, Professor & Dean, School of Life Sciences and School of Agricultural Sciences, Manipur University, Canchipur; Former Vice Chancellor, Sikkim State University, Gangtok Sikkim was Chief Guest of the programme. He expressed on the importance of the seed health testing and conservation

of the local seed traditionally. He also emphasized more research work on the traditional seed storage with modern plant protection approaches. Dr. Kajal Kumar Biswas, Secretary of IPS explained on the role of IPS and its functions.

### Women Scientist Conference

A special women National Conference on “Women Scientists in Plant Health Management for Sustainable Development Goals”, (A conference of the Women, by the Women, for the Women Scientists) was successfully organized from December 22<sup>nd</sup>-23<sup>rd</sup>, 2023, at AAU, Jorhat, Assam. Approx. 250 women scientists have participated.



### IPS National Conference on “Plant Health for Food Security: Threats and Promises”, at ICAR-IISR, Lucknow, Uttar Pradesh during February 1-3, 2024

The ICAR-IISR, Lucknow and Indian Phytopathological Society, New Delhi is organizing a National Conference on “Plant Health for Food Security: Threats and Promises”, at ICAR-Indian Institute of Sugarcane Research (IISR), Lucknow, Uttar Pradesh during February 1-3, 2024. Last date for submission of abstract is 31.12.2023 and early bird registration is 15.01, 2024. Kindly visit the conference website for registration and abstract submission (<https://conference.ipstdis.org/national/lucknow>).



## IPS Activities

### Announcement of IPS Award Applications (2024)

The online award applications for the various awards of the Society are invited from the members of the Society. The last date for submission of the online application is December 15, 2023. Please see the instructions available on the website before online application ([www.ipstdis.org/award-guidelines](http://www.ipstdis.org/award-guidelines)).

### Announcement of IPS Election (2024)

The online nominations are invited from members of the Society having voting right for the following office bearers in the Executive Council of the Society as per election schedule: President Elect (2024), Joint Secretary (2024 to 2025) and Zonal President & Zonal Councillor (2024).

The online Election Schedule:

Start date of Preliminary nomination : Dec. 01, 2023

Last date of Preliminary nomination : Dec. 17, 2023

Counting of Preliminary nomination : Dec. 18, 2023

Dispatch of letter to nominees : Dec. 19, 2023  
for consent

Last date for receipt of consent/  
withdrawal of nomination : Dec. 26, 2023

Start date of voting : Jan. 08, 2024

Last date of voting : Jan. 28, 2024

Counting of Final Votes : Jan. 29, 2024

Declaration of result : In the AGBM

For further details, please visit IPS website: <https://www.ipstdis.org>

## Obituary

- **Dr. M.S. Swaminathan**, the father of the Green Revolution in Asia and a builder of global institutions tasked with protecting the world's agricultural biodiversity, has died. He was 98. He passed away at his residence in Chennai, India on 28 September, 2023.
- **Dr. Ram Hari Singh**, former Principal Scientist, Division of Plant Pathology, ICAR-IARI, New Delhi passed away on July 14, 2023.
- **Prof. Mahendra Nath Khare**, former Dean College of Agriculture, Jabalpur & Rewa, University Professor & Head, Department of Plant Pathology, JNKVV, Jabalpur, has passed away to heavenly abode on 20 July 2023 at Jabalpur, after a short illness. He was 89.

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Published by  
**Indian Phytopathological Society**

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