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# पादप, रोगजनक एवं जन-समुदाय

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# Plant, Pathogens and People

Challenges in Plant Pathology to Benefit Humankind

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# Abstracts

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## O(S17)135: Management of grassy shoot disease in sugarcane and characterization of the associated phytoplasmas

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Sugarcane grassy shoot (SCGS) caused by SCGS-phytoplasma is an important disease of sugarcane reported widely in many sugarcane growing countries in Asian region. The disease was recorded more than 60 years before in India and currently occurs in all the sugarcane growing states. Almost all the varieties under cultivation are susceptible to the disease and the disease continues to cause severe economic losses in the country. Vegetative propagation i.e. planting of disease infected setts facilitates disease introduction in the field. However, subsequent ratoon crops exhibit severe incidences of the disease and it is one of the causes for poor cane yield in ratoons in sugarcane. Further different insects were reported as vectors and they facilitate transmission of this pathogen in the field. The disease is known to exhibit different phenotypic symptoms depending on the host genotype, location and environment. Usually production of excessive grassy tillers affects production of number of millable canes in the affected crop. Apart from excess tillers production, varying intensities of leaf chlorosis in severe symptomatic plants often coincides with physiological disorders which makes complications in early diagnosis of the disease. In view of that several diagnostic methods like ELISA and immunofluorescent techniques were developed in the past. Further, because of the limitations and lack of sensitivity in serological methods, PCR based assays were standardized for precise diagnosis of the disease. At ICAR-SBI, indexing of sugarcane seedlings raised through tissue culture for SCGS-phytoplasma is being taken up and the service is extended to the tissue culture production units in the country to produce healthy planting materials. Apart from heat therapy to inactivate phytoplasma in infected setts, tissue culture combined with molecular diagnosis serves as a viable strategy to manage the disease in the country. Since the disease expresses in various forms under field conditions, detailed investigations were carried out on variability in SCGS phytoplasmas at molecular level. Sequence analyses of rDNA and RFLP with different restriction endonucleases were performed to elucidate the genetic relationship among the phytoplasmas and between other related phytoplasmal groups. Although there were significant variations in phenotypic expression of SCGS phytoplasmas on sugarcane, we could not establish any genotypic variation among the pathogenic isolates in rDNA region. Among the other reported SCGS phytoplasmas it shared sequence similarity ranging from 99.7% to 94.3%. The new SCGS phytoplasmas showed 99.6% similarity with other phytoplasmas infecting sugarcane such as SCWL and 97.8% with SCYL. Despite with significant phenotypic variations in symptom expressions16S rRNA, 16S-23S rRNA SR and 23S rRNA sequencing and the restriction mapping of the amplicons did not show any genotypic variations among them and further characterization of the phytoplasma genome is necessary.

## O(S17)136: Unraveling dawkins extended phenotype - Molecular mechanism for Phytoplasma induced developmental alterations in host plants

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Phytoplasma is an important phytopathogenic mollicute causing several diseases in plants. Difficulties in establishing their cell free cultures have resulted in limited knowledge about their trans-kingdom life cycle and other features. Recent biotechnological advancements have made a paradigm shift in the study of these fastidious pathogens. Diverse symptoms caused by phytoplasma include conversion of floral parts to leafy structures (phyllody), severe reduction in internode length and increased number small leaves (witches' broom), flattening of stem (fasciation) and development of green flowers (virescens) etc. Therefore, pathogen essentially