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Content

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ENDOPHYTES FOR THE MANAGEMENT OF PLANT VIRUSES

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Abstract: Plant diseases caused by viruses account for an economic loss of about more than 30 billion US dollars a year. Endophytes are the future probiotics for plant health with great potential as biocontrol agents against plant viruses. Arbuscular mycorrhizal fungi and *Piriformospora indica* are the widely exploited fungal endophytes for management of plant viruses. Biocontrol activity of many other fungal endophytes are reported against viruses, *viz*., *Beauveria bassiana*, *Trichoderma harzianum* and *Metarhizium anisopliae*. Biocontrol activity of many bacterial endophytes are also reported against viruses *viz*.,*Pantoea agglomerans*and *Paenibacilluspasadenensis*. A continued research pipeline consisting of screening, in vitro and in vivo testing, biomass production and commercialization of endophytes as biocontrol agents can contribute to sustainable agriculture.

Keywords: Endophyte, Mycorrhiza, *Piriformospora indica*, Plant viruses

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MORPHOLOGICAL AND MOLECULAR CHARACTERISATION OF GROUNDNUT ROOT ROT DISEASE CAUSED BY *MACROPHOMINA PHASEOLINA* (TASSI.) GOID IN SOUTHERN DISTRICTS OF TAMIL NADU

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Abstract: Out of different solid media tested for the growth of ground root rot pathogen *Macrophomina phaseolina*, Potato Dextrose Agar medium (PDA) supported maximum mycelial growth followed by Peanut leaflet Oatmeal Agar medium (POMA). Among different pH tested, the maximum growth of the pathogen was observed at pH 7. Maximum mycelial growth of the pathogen was recorded at 35°C followed by 30°C. Ground nut root rot pathogen was molecularly characterized and confirmed as *M. phaseolina* by amplifying 530 bp size of ITS region using ITS1 and ITS4 primer pair.

Keywords: Root rot, *Macrophomina*, Groundnut, Pathogen

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DIVERSITY OF HYMENOPTERA AT THE VOC AGRICULTURAL COLLEGE CAMPUS, KILLIKULAM, TUTICORIN DISTRICT, TAMIL NADU, INDIA

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Abstract: A study was conducted to assess the diversity of Hymenopterans at the VOC Agricultural College and Research Institute, Killikulam, Tamil Nadu, India. A total of 746 individuals of hymenopterans belonging to 20 genera and 24 species within five families were recorded. The Formicidae family contributed the highest number of individuals (419), followed by Apidae with 221, Vespidae with 92, Scoliidae with 13, and Sphecidae, which had just 1 individual, the least represented. The fire ant, *Solenopsis geminata* (Family: Formicidae), was the most abundant species with 186 individuals, accounting for 24.93% of the total hymenopterans recorded. The month of August, 2024 had the highest activity with 348 individuals, while the lowest numbers were observed in June 2024 with 53. Species diversity was highest in the Formicidae family (1.90) and lowest in the Apidae family (1.30).

Keywords: Hymenopterans, Diversity, Diversity indices, Killikulam

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EVALUATION OF DIFFERENT PH ON THE GROWTH OF *CORYNESPORA CASSIICOLA* OF COTTON

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Abstract: Cotton (*Gossypium hirsutum* L.) is one of the world's most important fiber crops with a significant economic and social impact. It is the world's oldest commercial crop, which provides fiber for mankind's garments. It is also known as "The king of fibers" or "The white gold". Cotton is primarily a raw material for a thriving textile industry and is also one of the most ancient and essential commercial crops, next to food grains. Among which, the Corynespora leaf spot of cotton caused by *Corynespora cassiicola* is observed in moderate form causing considerable damage in recent times but the disease has the potential to be severe and it could become significant concern for the cotton growers. Here in this experiment, the test fungus *C. cassiicola* could grow, sporulate and showed same colour of mycelium and different colour of substrate in wide range of pH from 4.0 to 10.0. The colony diameter was significantly higher in pH 7.0 followed by pH 8.0, pH 5.0, pH 6.0, pH 9.0 and pH 10.0. The poor growth was recorded at pH 4.The sporulation of *C. cassiicola* was found abundant at pH 7.0 and pH 8.0. It was moderate at pH 5.0, pH 6.0, pH 9.0 and pH 10.0 while, it was found scanty at pH 4.0. The colour of mycelium and substrate was observed grayish white and greenish, respectively.

Keywords: Cotton, *Gossypium spp*, Treatment, Disease, pH, Sporulation

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ECONOMIC POTENTIAL OF THE RED SEAWEED *PORPHYRA* (ORDER BANGIALES: RHODOPHYTA) IN INDIA

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Abstract: The red seaweed genus *Porphyra* is one of the economically important seaweeds and contains various bioactive compounds of nutritional and pharmaceuticals values. Because of its economic potential, *Porphyra* is being intensively studied, cultivated, and commercially utilized in many parts of the world. Taxonomically this genus has undergone many nomenclatural changes due to the recent molecular assessments. Presently *Porphyra* is represented by 83 taxa in the world and four taxa in India namely *Porphyra chauhanii* C. Anil Kumar & M.V.N. Panikkar, *P. indica* V. Krishnam. & M. Baluswami, *P. malvanensis* Anil Kumar & P.S.N. Rao and *P. okhaensis* H.V. Joshi, R.M.Oza & A.Tewari. The present paper comprehensively reviews the economic potential of *Porphyra* in Indian perspectives.

Keywords: Economic potential, Nori, *Porphyra*, Porphyran, Rhodophyta.

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USES OF DIFFERENT INDICES FOR RABI CROPS DIVERSIFICATION IN HARIDWAR DISTRICT

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Abstract: Haridwar District belongs to the Garhwal region of Uttarakhand known as Tarai-Bhabar region. It lies from 29 35' to 30 40' North latitude and 77 43' to 78 22' East longitude. The Major crops of the Haridwar district are Rice, wheat, sugarcane. Pulses and oil seeds but sugarcane is the main crop. The four indices: Index of Land, Sustainability Index (SI), Relative Yield Index (RYI) & Index of Crop Diversification (ICD) are used for crop diversification, sustainability & productivity. The index of land observed 36.1% minimum in year 2007-08 & in year 2000-01 maximum index of land is observed 45.5% in the area. The *Rabi* season crops data analysis where maximum sustainability index 0.79 was observed in rice crop & lowest sustainability index observed in lentils 0.42. The lowest RYI value in sugarcane crop (37) whereas highest value observed in wheat crop (154). The diversification index ranged between 0 and 1, with higher values indicating a high degree of crop diversification. The overall analysis of *Rabi* crops data observed Sugarcane, wheat & rice whereas lowest value observed in bajra, pea and gram. The present study is based on secondary sources of time series data of 20 years 2000-01 to 2019-20. The indices are used for analysis of sustainability of *Rabi* crops in Haridwar area.

Keywords: Haridwar, *Rabi* crops, Garhwal region