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Short Review

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[New Fungi Associated with Blackberry Root Rot \(*Rubus* spp.\), in Michoacán, Mexico](#)

Los Reyes, Michoacán, Mexico, is one of the main blackberry-producing places in the world, however, the disease located at the root level has caused important economic losses. Currently has been reported that the fungus *Fusarium* spp., is the main causal agent but actions to control it have failed. The objective of this work was to identify the possible presence of unreported pathogenic fungi in the root system of the blackberry and identify them molecularly. It was sampled in a commercial open-air orchard from Los Reyes, pieces of roots were taken from symptomatic plants with wilting and decay. The fungi were isolated in the laboratory, identified with taxonomic keys, extraction was performed, and the sequences obtained were compared with those reported in the NCBI gene bank. Among the results obtained were *Kalmusia italica*, *Epicoccum nigrum*, *Microsphaeropsis arundinis*, *Achizophyllum commune*, and, as expected, some species of *Fusarium* spp.

Research Article

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[Effect of Whitefly \(*Bemisia tabaci* Genn.\) Infestation on the Growth Parameters of Eggplant \(*Solanum melongena* L.\) in Kebbi State, Nigeria](#)

Whiteflies (*Bemisia tabaci* Genn.) are aggressive hemipteran species that depend primarily on leaf tissue for their nourishment, causing substantial damages and yield losses in their hosts. This study was carried out to assess the effect of whitefly infestation on the growth parameters of one of the commercial eggplant cultivars (round green *Solanum melongena* L) under field conditions. The trial consists of four treatments (T1= 15, T2= 30, T3= 45 and control (T4) = 0 whiteflies/plot) replicated four times. The result revealed that all the parameters assessed are negatively affected by whitefly infestation with plants in treatment (T3) being most affected while those in T1 are least affected. The dry weight recorded least value (1.1 g/leaf) having the highest percentage reduction (69.11%) followed by leaf area with 152.5cm² (48.83% reduction) while the number of leaves was least affected recording 50.3 leaves/plant (18.09% reduction) at 90 days after infestation in 2022 experiment. In 2023 experiment, similar results were recorded with plants in T3 being most affected. Dry weight of the leaves had the lowest value (1.3g/leaf) representing the highest reduction (68.30%) followed by the leaf area with 167.3cm² (44.8% reduction) with the number of leaves also being least affected, recording 52.1 leaves/plant representing 9.40% reduction with plants in treatment T1, at 90 days after infestation. The highest reduction in yield was also recorded with plants in T3 (92.10, 90.10%) while the least was observed in T1 (86.8 and 85.70%) for the respective trials (2022 and 2023). The result shows the level of susceptibility of the variety examined to whitefly infestation, demonstrating the urgent needs for the development of eco-friendly and sustainable whitefly management regimes for improved eggplant production in the area.

Mini Review

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[A Brief Dig into the Potent Medicinal Plant *Phyllanthus Amarus* Schum. and Thonn.](#)

Phyllanthus amarus Schum. and Thonn., a plant of substantial medicinal significance, is known for its usage in the 'Ayurvedic' system of medicine for over 2000 years. This herb grows throughout the world including India. P. amarus along with other species of its genus has been a vital part of several herbal formulations available in the Indian market under the trade name Bhuiamlaki. Several pharmacognostic evaluations over the years established the genus Phyllanthus of great commercial value. Ethnopharmacological studies conducted with P. amarus to date have shown its diverse therapeutic usage globally. This owes to the vast array of secondary metabolites present in the herb, substantially in the leaf tissue. Different analytical and phytochemistry studies performed across the globe revealed that P. amarus is a hub of various classes of secondary metabolites viz. lignans like phyllanthin, hypophyllanthin, flavonoids, alkaloids, triterpenes, sterols, volatile oil, ellagitannins including simple and complex tannins, etc. Different analytical techniques have been employed over the past years for isolating and studying these varied secondary metabolites. Further, bioactivities and pharmacological properties of P. amarus that were mainly due to the presence of these wide arrays of secondary metabolites have also been explored extensively across the globe by several research groups. This plant has also been explored at molecular and transcriptome level, although relatively lesser but its extensive molecular and transcriptome analysis have only been performed from our lab. Thus, P. amarus has considerable potential to be explored in the future as a significant therapeutic source not only in the traditional medicinal system but also in the modern pharmaceutical industry.

Research Article

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[Auxin-like and Cytokinin-like Effects of New Synthetic Pyrimidine Derivatives on the Growth and Photosynthesis of Wheat](#)

The regulatory effect of new synthetic thienopyrimidine derivatives on the growth and photosynthesis of wheat (*Triticum aestivum* L.) variety Svitlana in the vegetative phase was studied. The regulatory effect of new synthetic thienopyrimidine derivatives was compared with the regulatory effect of auxin IAA (1H-indol-3-yl)acetic acid) or synthetic plant growth regulators Methyur (sodium salt of 6-methyl-2-mercapto-4-hydroxypyrimidine) and Kamethur (potassium salt of 6-methyl-2-mercapto-4-hydroxypyrimidine). After 2 weeks, morphometric parameters (such as average length of shoots and roots (mm), average biomass of 10 plants (g)) and biochemical parameters (such as content of photosynthetic pigments ($\mu\text{g/ml}$)) of wheat plants grown from seeds treated with synthetic thienopyrimidine derivatives, or auxin IAA, or synthetic plant growth regulators Methyur and Kamethur at a concentration of 10^{-6}M , were measured and compared with similar parameters of control wheat plants grown from seeds treated with distilled water. The regulatory effect of new synthetic thienopyrimidine derivatives on the morphometric and biochemical parameters of wheat plants was similar or higher compared to the regulatory effect of auxin IAA, or synthetic plant growth regulators Methyur and Kamethur. The relationship between the chemical structure of new synthetic thienopyrimidine derivatives and their regulatory effect on the growth and photosynthesis of wheat plants was revealed. The most biologically active thienopyrimidine derivatives are proposed to be used as new synthetic physiological analogues of auxins and cytokinins to improve growth and increase photosynthesis of wheat (*Triticum aestivum* L.) variety Svitlana in the vegetative phase.

Short Communication

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[Declaration of Fumonisin as the Main Dangerous Mycotoxin Produced by Fusarium Species on Maize in Iran](#)

Our study showed *Fusarium* spp. can be the most important fungal pathogen of maize causing severe yield losses and producing fumonisins that concern human and animal damages. Actually, other mycotoxins such as aflatoxin contamination have become regular in maize but the appearance of fumonisins was more frequent. However, the fluctuation between years and regions can affect the severity of the infection and then fumonisin production level. This mycotoxin was defined as fumonisin B1, fumonisin B2 and fumonisin B3 with diverse actions. The level of production, concentrations, and damages of fumonisins were found in different locations of maize fields in Iran. However, the fumonisin contents of the isolated samples were more diverse than in other locations. Toxin composition and maximum values differ significantly throughout the climate conditions and maize cultivars. The resistance cultivar of maize against the *Fusarium* pathogen can be helpful in controlling fumonisin production on the field effectively.

Research Article

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[Comparison of RGB Indices used for Vegetation Studies based on Structured Similarity Index \(SSIM\)](#)

Remote sensing methods are receiving more and more attention during vegetation studies, thanks to the rapid development of drones. The use of indices created using different bands of the electromagnetic spectrum is currently a common practice in agriculture e.g. normalized vegetation index (NDVI), for which, in addition to the red (R), green (G) and blue (B) bands, in different infrared (IR) ranges used bands are used. In addition, there are many indices in the literature that can only be calculated from the red, green, blue (RGB) bands and are used for different purposes. The aim of our work was to objectively compare and group the RGB indices found in the literature (37 pcs) using an objective mathematical method (structured similarity index; SSIM), as a result of which we classified the individual RGB indices into groups that give the same result. To do this, we calculated the 37 RGB indexes on a test image, and then compared the resulting images in pairs using the structural similarity index method. As a result, 28 of the 37 indexes examined could be narrowed down to 7 groups - that is, the indexes belonging to the groups are the same - while the remaining 9 indexes showed no similarity with any other index.

Mini Review

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[Bio Avengers: How do Endophytic Microorganisms Alter a Plant's Defense Mechanisms?](#)

Endophytic microbes i.e. bacteria, fungi, and actinomycetes live inside the plant tissues without causing any harmful effect on them. Recently, research has been conducted on endophytic microbes to enhance agriculture and environmental sustainability. Endophytes stabilize a close association with their host, which leads to major changes in plant physiology. Endophytic microbes and pathogens use the same strategies for entering the host cell. This condition may create competition between the endophytes and the pathogen. Therefore, host plants develop strategies to allow the entry of specific microorganisms. Additionally, endophytic microorganisms may temper their own genetic structure to survive and avoid the host defence machinery. The plant-endophyte symbionts promote direct and indirect defences to host plants. This plays an essential role in modulating plant defences against various stresses, particularly biotic stress. In this minireview, we highlight the interaction of endophytic microbes with their host. As well as the role of endophytic microbes in the enhancement of plant defence systems.
