

# Journal of Plant Science and Phytopathology

Volume - 6, Issue - 3

Research Article

Published Date:-2022-12-29 17:07:00

[UPLC-Q-TOF-MS-based untargeted studies of the secondary metabolites secreted by \*Sclerotinia sclerotiorum\* under the axenic condition](#)

The stem rot disease has emerged globally as a major threat to oilseed Brassica's productivity and seed quality. The generalist causal pathogen *Sclerotinia sclerotiorum* (Lib.) de Bary shows large variability in their aggressiveness and pathogenicity. Revealing the pathogen's metabolic profile and signaling components in host-pathogen interaction is fundamental in understanding host resistance to the disease. In this study, the metabolites released by the pathogenic strains of *S. sclerotiorum* under the axenic culture have been identified using the untargeted high-resolution UPLC-QTOF-ESI-MS/MS. The analysis of the ethyl acetate extracts of the *S. sclerotiorum* culture revealed ten major secondary metabolites namely, sclerin, sclerotinin-B, sclerone, melanin, bostrycoidin, botcinin-D, botcinin-A, gliovirin, scleramide, and botcinic acid. The later six metabolites are being reported for the first time in the culture extract of the *S. sclerotiorum* pathogen. Based on the overlapping and unique informative peaks in the chromatograms, the six *S. sclerotiorum* strains were grouped into three major clades in the phylogenetic analysis. The clustering based on metabolic profiles does not substantiate the diversity based on morphology or virulence differences over the host. The findings of the study signified the metabolites secreted under the axenic conditions are varies based on their growth and developmental stages and may not necessarily be the determining factors for their differential aggressiveness and virulence to their host.

---

Mini Review

Published Date:-2022-12-23 12:06:51

[Planococcus citri \(Risso\) \(Hemiptera: Coccoomorpha: Pseudococcidae\) on Strawberry \(\*Fragaria vesca\* L., Rosaceae\) in Silifke, Mersin, Turkey](#)

*Fragaria vesca* L. (Rosaceae), called "wild strawberry", "woodland strawberry", "Alpine strawberry", "Carpathian strawberry" or "European strawberry" is grown naturally throughout much of the Northern Hemisphere and produces fruits. The plant can be spread mostly by stolons as well as by the seeds to establish new populations.

---

Mini Review

Published Date:-2022-11-30 12:35:43

[Research progress on marker-assisted selection pyramiding breeding of disease resistance genes in wheat](#)

Marker-Assisted Selection (MAS) pyramiding breeding combined with traditional breeding techniques has become an important method for molecular breeding in wheat. In recent years, with the continuous discovery of disease-resistance genes and the development of molecular markers associated with related genes in wheat, the research of MAS pyramiding disease-resistance genes has made great progress. The progress on the study of MAS pyramiding resistance genes in wheat powdery mildew, rust, and Fusarium head blight (Fhb) was reviewed. The aims of pyramiding breeding were discussed in order to promote the research on MAS pyramiding breeding in wheat.

---

Mini Review

Published Date:-2022-11-28 12:31:42

[A look at polyploidy and plant breeding](#)

---

Polyploidization is a process that generates genetic variability and therefore one of the engines of biological evolution. Since polyploidization produces important changes in the phenotype, mainly an increase in the size of the organs (i.e.: flowers and fruits), it is also a very important and powerful tool for plant improvement. Despite its intense use in breeding programs for various species, very little is known so far about the nature of this phenomenon. This work presents a brief review of the results obtained by the use of this tool in plant breeding and also raises some reflections on its mechanism of action.

---

**Opinion**                      **Published Date:-2022-11-17 12:10:58**

[The Indole acetic acid in bacteria, fungi and plants](#)

Indole acetic acid (AIA) is the most important plant growth hormone since it intervenes in the mechanisms of cell growth and differentiation and is produced mostly in the meristematic zones of the plant for apical dominance or root growth. AIA is also produced in root nodules and plant galls. In the latter cases, its presence is associated with endophytic bacteria. Although it is a plant growth hormone, it is also produced by bacteria such as *Azospirillum brasilense* and *Bradyrhizobium japonicum*. These species live in the soil (rhizosphere) or can colonize the roots (endophytic) of their hosts. From these bacteria, there are also isolates that are nitrogen fixers, which in addition to providing growth factors to plants, contribute by releasing nitrogenous molecules that improve plant nutrition.

---

**Research Article**                      **Published Date:-2022-11-15 11:58:14**

[Post-harvest assessment of infectious fruit rot on selected fruits in Lafia, Nasarawa State Nigeria](#)

The post-harvest health and microbial safety of plant products and foods continue to be a global concern to farmers, consumers, regulatory agencies and food industries. A study was carried out to evaluate the pathogenicity of fungi associated with post-harvest rot of oranges, watermelons and bananas in Lafia, Nasarawa State, Nigeria. Healthy fruits inoculated with fungal spores obtained from rotted fruit tissues were incubated at ambient temperature conditions and observed daily for the appearance and development of tissue rot. Oranges and Watermelons had the highest number of fungal isolates (3) compared to banana (2). Fungi belonging to the genus *Curvularia* were the most isolated (37.50%), followed by both *Aspergillus* and *Colletotrichum* (25.00% respectively) and lastly *Alternaria* (12.50%). The highest tissue rot diameter of sweet orange (2.40 cm) was induced by *Alternaria* sp. followed by *Curvularia* geniculata (1.40 cm) and lastly *Colletotrichum* sp. (1.28 cm). The highest rot of banana fruit tissues was produced by *A. niger* (3.90 cm), followed by *Curvularia* geniculata (3.40 cm). *Aspergillus* sp. produced the highest tissue rot diameter on watermelon fruits (1.93 cm), followed by *Colletotrichum* sp. (1.30 cm) and lastly *Curvularia* geniculata (1.20 cm). Differences in the susceptibilities of different fruits to rot by fungal pathogens were significant ( $p < 0.05$ ). There is need for improved handling of fruits after harvest to prevent losses due to bacterial and fungal rots in the study area.

---

**Short Communication**                      **Published Date:-2022-11-10 16:46:29**

[Flashes of UV-C light are perceived by UVR8, the photoreceptor of UV-B light](#)

Light is an important regulator of plant morphogenesis and plant-pathogen interactions via specific photoreceptors and signaling pathways. Besides visible light, other electromagnetic radiations may play roles, notably ultraviolet (UV) light. The UV part of the electromagnetic spectrum includes UV-A (315 nm - 400 nm), UV-B (280 nm - 315 nm) and UV-C radiations (200 nm - 280 nm). UV-B and UV-C have been reported to increase plant resistance to plant pathogens after the UV perception and signaling stages. The perception of UV-B radiation is achieved by the dimer protein UVR8 (UV RESISTANCE LOCUS 8). Even though the action spectrum of this photoreceptor overlaps in the UV-C domain, it has never been formally demonstrated that UVR8 could also act as a photoreceptor of UV-C light. We provide here original observations showing that UVR8 can indeed perceive UV-C light provided that the latter is in the form of flashes (1s) and not continuous illuminations (the 60s). Our observations also show that the response of UVR8 to flashes of UV-C light is dose-dependent. They could explain why flashes of UV-C light are more effective for stimulating plant defenses than continuous illuminations for the same amount of energy delivered to plants (J/m<sup>2</sup>). Eventually, our observations support ongoing trials that aim at using UV-C light as an environmental-friendly plant resistance inducer in field conditions.

---

[Assessment of indigenous methods of shea butter processing among rural women in Borgu Local Government Area of Niger State, Nigeria](#)

Indigenous food processing and preservation methods are on the verge of collapse, yet they proved promising and sustainable. The study assessed the indigenous methods of shea butter processing among rural women in the Borgu Local Government Area of Niger State, Nigeria. Specifically, it described the socioeconomic characteristics of respondents, examined the shea butter processing techniques used and identified the information sources of shea butter processors in the study area. A multistage sampling technique was used to select 100 respondents. Descriptive (such as frequency count, percentage, charts and tables) and inferential statistics (such as Pearson correlation and chi-square) were used to analyze the data. Findings showed the mean age of respondents was  $45.61 \pm 11.82$ , with mean years of experience of  $20.39 \pm 12.96$ , the majority (85%) were married and the major sources of information on indigenous shea butter processing came from family members and friends. At  $p < 0.01$  there was a significant association between respondents' usage of indigenous methods and their marital status ( $\chi^2 = 84.24$ ;  $p < 0.01$ ), membership in cooperative society ( $\chi^2 = 40.43$ ;  $p < 0.01$ ), and community membership ( $\chi^2 = 53.21$ ;  $p < 0.01$ ). However, there was a significant relationship between respondents' usage of indigenous methods and household size ( $b = 0.290$ ;  $p < 0.05$ ), quantity produced ( $b = 0.616$ ;  $p < 0.10$ ) and annual income ( $b = -0.765$ ;  $p < 0.05$ ). It was concluded that indigenous methods of processing shea butter are widespread among respondents; knowledge is acquired through family and friends. Among others, the study recommends that extension agents be posted to rural areas to educate rural women and build on their indigenous knowledge of processing shea butter to introduce high-quality butter.

---

[Characterization of senegalese races of \*Xanthomonas oryzae\* PV. \*oryzae\* to identify resistance genes to use](#)

Bacterial blight (BB), is a disease caused by *Xanthomonas oryzae* PV. *oryzae* (Xoo), was first reported in Senegal by Trinh in 1980. BB represents a severe threat to rice cultivation in West Africa. Characterizing the pathotypic diversity of bacterial populations is a key to the management of pathogen-resistant varieties. Pathogenicity tests show that all strains are virulent on the susceptible rice variety Azucena, and interact differentially with twelve near-isogenic rice lines, each carrying a single resistance gene. On this rice panel, six races were identified, two of which were previously reported in Mali (A3) and Burkina Faso (A1). Four races (S2, S4, S5, and S6) are described for the first time in Africa. Races A1, isolated in Ndiaye and Ndoum areas is the most prevalent in Senegal. The *Xa1* gene controls 100% of the isolates tested and *xa5* controls all isolates except S4 strains. The geographical distribution of Xoo races is contrasted. Four races are detected in the North and two in the South East of the country. Race S4 can be a major risk to rice cultivation because strains from this race are the most virulent and can only be controlled by *Xa1*. To identify local sources of resistance, we screened Xoo strains representative of the various races on twenty-three rice varieties grown by farmers in Senegal. Four rice varieties namely Sahel210, Sangangbye, Dansna2, and Sahel305 effectively control all the isolates tested. Our characterization of the first collection of Senegalese Xoo strains provided insight into the races present in the country and identified sources of resistance in local rice varieties. This information will help design effective breeding programs for resistance to bacterial leaf blight in Senegal.

---

[The ongoing search for sustainable agriculture](#)

Agricultural land use has left its traces on the planet since sedentary agriculture started. Most of the ancient cradles of mankind and agriculture, such as the area between the rivers Euphrates and Tigris or the middle east are degraded and deserts today.

---

[Micropropagation and cytological studies of \*Aole vera\* Linn](#)

Aloe vera Linn. is an essential medicinal plant. In this present research work, a protocol of in vitro regeneration and karyomorphological analysis of Aloe vera was developed using different concentrations and compositions of media. Shoot apices of field-grown plants were used as explant and aseptically cultured on Murashige and Skoog (MS) medium fortified with different concentrations and combinations of auxins (IAA and NAA) and cytokinins (BAP and Kn). The highest number of multiple shoot buds ( $4.36 \pm 0.07$ ) was obtained from MS + 2.0 mg/l BAP + 1.0 mg/l IAA and induced shoot buds underwent rapid elongation ( $4.24 \pm 0.06$  cm) on the same medium composition. Half strength MS media with 2.0 mg/l IBA was suitable for induction and proliferation ( $6.31 \pm 0.05$ ) of roots and 95% of plantlets were acclimatized to field conditions successfully. Somatic chromosome numbers of mother and in vitro grown plants were confirmed to be  $2n = 14$ . Chromosome length ranged from 4.28 - 13.74  $\mu\text{m}$  in the naturally grown plants and 4.46 - 14.1  $\mu\text{m}$  for in vitro grown plants. The total form percent (TF%) of mother and in vitro grown plants was 41.69% and 42.23%, respectively. The karyotype formula of in vivo grown plants was  $2n = 14 = 4\text{Lsm} + 6\text{Mm} + 4\text{Sm}$ , whereas that of the micropropagated plants was  $2n = 14 = 4\text{Lsm} + 4\text{Mm} + 6\text{Sm}$ . The frequency of the chromosome having arm more than 2:1 was 0.08 for mother plants and 0.15 for in vitro grown plants. Therefore, the karyotype of both plants falls into the 2B symmetrical type based on Stebbins classification (1971).

---

## Review Article

Published Date:-2022-09-29 15:24:21

[Photocatalytic degradation of organic pollutants in the presence of selected transition metal nanoparticles: review](#)

Photocatalysis has attracted a lot of attention in recent years due to its potential in solving energy and environmental issues. Efficient light absorption and charge separation are two of the key factors for the exploration of high-performance photocatalytic systems, which are generally difficult to obtain from a single photocatalyst. The combination of various materials to form heterojunctions provides an effective way to better harvest solar energy and facilitate charge separation and transfer, thus enhancing photocatalytic activity and stability. This review concisely summarizes the recent development of visible light responsive heterojunctions, including the preparation and performance of semiconductor/semiconductor junctions and semiconductor/metal junctions and their mechanism for enhancing light harvesting and charge separation/transfer. In this regard, this review presents some unitary, binary and ternary  $\text{CeO}_2$  photocatalysts used for the degradation of organic pollutants. We expect this review to provide the type of guidelines for readers to gain a clear picture of nanotechnology and the fabrication and application of different types of heterostructured photocatalysts.

---

## Review Article

Published Date:-2022-09-20 12:00:59

[An overview of the developments of nanotechnology and heterogeneous photocatalysis in the presence of metal nanoparticles](#)

In general, nanotechnology can be understood as a technology of design, fabrication and applications of nanostructures and nanomaterials, as well as a fundamental understanding of the physical properties and phenomena of nanomaterials and nanostructures. In recent years the development of industries like textile, leather, paint, food, plastics, and cosmetics is enlarged and these industries are connected with the discarding of a vast number of organic pollutants which are harmful to microbes, aquatic systems, and human health by influencing the different parameters. So the fabrication of those nanomaterials (coupled or doped) to form heterojunctions provides an effective way to better harvest solar energy and facilitate charge separation and transfer, thus enhancing the photocatalytic activity and stability. We expect this review to provide a guideline for readers to gain a clear picture of the fabrication and application of different types of heterostructured photocatalysts. In this review, starting from the photocatalytic reaction mechanism and the preparation of the photocatalyst, we review the classification of current photocatalysts, preparation methods, a factor that affects photocatalytic reaction, characterization of photocatalysts, and the methods for improving photocatalytic performance. This review also aims to provide basic and comprehensive information on the industrialization of photocatalysis technology.

---

## Opinion

Published Date:-2022-09-07 10:09:22

[Mitigation and adaptation to climate change of plant pathogens](#)

---

The impact of climate change on plant diseases poses a serious threat to food security [1-4]. Climate change has a direct effect on the occurrence and severity of disease in crops. Global plant health assessment and crop loss estimation due to pests and diseases has been made especially for cropping regions defined by the major crops of wheat, rice, maize, potato and soybean [5].

---

## Research Article

Published Date:-2022-08-25 09:51:01

[Genetic variability in the susceptibility of immature peach fruit to \*Monilinia laxa\* is associated with surface conductance but not stomatal density](#)

*Monilinia laxa* is a fungus that causes brown rot in stone fruit. Immature green fruits in the first stage of fruit development (stage I) are generally susceptible. To investigate the relationship between the physical characteristics of immature fruit and susceptibility to *M. laxa*, we characterized the progeny, derived from a clone of wild peach (*Prunus davidiana*) crossed with two commercial nectarines (*Prunus persica*) varieties, through laboratory infection, transpiration monitoring and stomata counting. Two types of fruit infections were observed - 'classic' brown rot and 'clear spot' symptoms - which have not previously been described in the literature. The number and density of stomata did not explain the observed variability of infection in the progeny. However, surface conductance was positively correlated with infection level. This study provides experimental evidence partially linking physical fruit characteristics to brown rot infection at the immature fruit stage. The role of delayed cuticle deposition in susceptibility to brown rot of immature fruit is discussed.

---