Susceptibility of cultivars and Cyto species to Geosmithia; a cause of brown spot and canker disease

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Pythium apineum sp. nov.: Its morphology, molecular phylogeny, and infectivity for plants

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During survey of the Pythium species in soils of Japan, high-temperature growing Pythium strains were isolated from an unsown cultivated field soil in Wakeyama Prefecture. The all six strains showed similar morphology each other, and had incompletely branched secondarily hyphae, globose non-proliferating sporangia and smooth surface oogonia which have one or two polar cones per oogonium. The morphological characteristics of the Pythium species were differentiated from the others known species of Pythium. Phylogenetic analysis based on sequences of the D1/D2 regions of the large subunit ribosomal DNA showed that all the Pythium strains were clustered in a single clade which distantly related from the other known clades of the genus. We described these strains as a new Pythium species, Pythium apineum sp. nov., based on morphology, and molecular phylogeny. The P. apineum strains infected non-symptomatically to the roots of seedlings of berndragrass, cabbage and cucumber in a pot inoculation test.

Characterization of an ATP/ADP translocase in the citrus huanglongbing bacterium, Candidatus Liberibacter

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Citrus huanglongbing (HLB), a disease currently threatening the citrus industry worldwide, has been associated with three different species of Alphaproteobacteria known as Candidatus Liberibacter. A complete genome sequence was recently obtained via metagenomics for Co. Lasi (Cav.), the prominent species of the bacteria found within the United States. Because of its rapid spread and devastating effects, efforts are underway to decipher the genetic information found within the genome of this obligate intracellular pathogen for targets, which may be used to control this deadly disease. One putative protein target encoded by Ras is that of an ATP/ADP translocase. This enzyme has been shown to directly import ATP into a cell from its surroundings, thus allowing the bacterium to act as an energy parasite on its host. The ATP/ADP translocase identified in Ras contains the 12 transmembrane helices typical of this class of protein and has an isolectric point of 9.3. Although the bacterial translocase has been characterized in other intercellular parasites such as Chlamydia trachomatis and Rickettsia prowazekii, it has not been characterized in a plant bacterial pathogen. Here, we have analyzed the use of this system as a potential target to combat the Co. Lasi Liberibacter species.

Physical methods for postharvest control of Cryptosporisoris perennis

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This research was carried out to study the colonization of Cryptosporisoris perennis (Zeller & Childs) Wollenweber (1970) on fruit surface and to assess the efficiency of physical methods for its control in apples. Scanning electron microscopy of apples inoculated with C. perennis, showed colonization of lenticels in 'Maxi Gala', and between lenticels in 'Fuji Kiku'. Contamination of C. perennis in aqueous suspension was assessed for their susceptibility to heat exposure for 20°C for 15 seconds (control), and at 45, 50 and 55°C for 15 and 30 seconds, and to UV-C radiation (at doses between 0.018 x 10^4 and 3.00 x 10^4 ergs/mm^2, besides the control, without UV-C radiation). The number of colony forming units was 0.018% when the pathogen suspension was treated at 50 and 55°C, during 15 and 30 seconds, as well as with treated with UV-C radiation, at doses between 0.75 x 10^4 and 3.00 x 10^4 ergs/mm^2. Apples 'Fuji Kiku' inoculated with C. perennis were treated with UV-C radiation, at doses between 0.37 x 10^4 and 1.50 x 10^4 ergs/mm^2, and subjected to hot water (50°C) spraying during 15 and 30 seconds, in a commercial packing line. In both experiments control fruits received water spraying at 28°C for 15 seconds. Sprays collected on fruits treated with different doses of UV-C radiation and times of hot water (50°C) spraying exhibit germnation inferior to 94%.

Addition of food preservatives to hydroxypropyl methycellulose-lipid edible coatings to control postharvest penicillium molds of citrus fruit

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New hydroxypropyl methycellulose (HPMC)-lipid edible composite coatings containing food additives or GRAS compounds with antifungal properties were developed. Film disks containing sodium salts of parabens, potassium sorbate (PS), or sodium benzoate (SB) were the most effective to inhibit in vitro the pathogens Penicillium digitatum and Penicillium italicum, which develop symptoms on citrus fruits. Several coatings containing green and blue molds, respectively. Selected coatings were tested in vivo on Valencia oranges and 'Oranjerie' mandarins to determine their curative (fruit coated after fungal inoculation) and preventive (fruit coated before fungal inoculation) antifungal activity. In general, the curative activity after inoculation at 20°C for 7 days was higher on oranges than on mandarins. On coated oranges, coatings prepared with the mixture PS+SB reduced disease incidence and severity up to 85 and 95%, respectively, with respect to uncoated control. On coated mandarins the incidence of green and blue molds was reduced by about 65 and 80%, respectively, by the application of a PS+SP (sodium propionate)-based coating. The tested coatings did not provide any preventive activity against both molds. These (HPMC)-lipid edible coatings effectively preserved fruit quality during cold storage and showed promise as nonpolluting commercial alternatives to conventional citrus waxes.

Effect of acibenzolar-S-methyl on the management of early blight and target spot of tomato

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Acibenzolar-S-methyl, the active ingredient of Actigard (Syngenta Crop Protection, Greensboro, NC), is an elicitor of plant defenses. While labeled for use on fruits and vegetables, is currently licensed to control of bacterial leaf spot (Xanthomonas spp.) and bacterial speck (Pseudomonas syringae). In 2006, two field trials assessed the performance of Actigard (8 weekly applications at 0.75 oz per acre) when integrated into a standard spray program that included weekly applications of copper sulfate (2.1 lbs a.i. per acre) mixed with either mancozeb (1.5 lbs a.i. per acre) or chlorothalonil (1.5 lbs a.i. per acre). The addition of Actigard reduced the severity of early blight (Alternaria solani) and target spot (Corynespora cassicola) by 22 to 37%, respectively, in the standard spray program alone, and by 31 to 60% compared to the non-treated plots. In the spring trial, plots treated with Actigard yielded 336 more cartons (25 lbs) of marketable tomatoes per an acre than those receiving the standard alone, and 1,179 cartons more per an acre than the non-treated plots. No yield improvement was observed in the fall trial, due to the late development of disease in the season. Results demonstrate the benefit of including Actigard as part of an overall spray program to manage common foliar diseases caused by bacterial and fungal pathogens of tomato.

Effect of acibenzolar-S-methyl on bacterial leaf spot of shrub roses caused by a Xanthomonas sp.

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Shrub roses have gained popularity in modern landscapes due to their low maintenance and resistance to many of the diseases that plague the older modern and old garden roses. Recently, a Xanthomonas sp. was identified on...