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Production of Vermiwash from Medicinal Plants and Its Potential Use as Fungicide against the Alternaria Alternata (fr.) Keissl. Affecting Cucumber (Cucumis sativus L.) in Guyana

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Abstract : Vermiwash could be used to enhance plant productivity and resistance to some harmful plant pathogens, as well as provide benefit through the disposal of waste matter. Alternaria rot caused by the fungus Alternaria alternata (Fr.) Keissl., is a common soil-borne pathogen that results in postharvest fruit rot of cucumbers, peppers and other cash crops. The production and distribution of Cucumis sativus L. (cucumber) could be severely affected by Alternaria rot. Fungicides are the traditional treatment however; they are not only expensive but can also cause environmental and health problems. Vermiwash was prepared from various medicinal plants (Ocimum tenuiflorum L. {Tulsi}, Azadirachta indica A. Juss. {neem}, Cymbopogon citratus (DC. ex Nees) Stapf. {lemon grass} and Oryza sativa L. {paddy straw} and applied, in vitro, to A. alternata to investigate their effectiveness as organic alternatives to traditional fungicides. All of the samples of vermiwash inhibited the growth of A. alternata. The inhibitive effects on the fungus appeared most effective when A. indica and O. tenuiflorum were used in the production of the vermiwash. Using the serial dilution method, vermiwash from O. tenuiflorum showed the highest percent of inhibition (93.2%), followed by C. citratus (74.7%), A. indica (68.7%), O. sativa, combination, and combination without worms. Using the sterile disc diffusion method, all of the samples produced zones of inhibition against A. alternata. Vermiwash from A. indica produced a zone of inhibition, averaging 15.3mm, followed by O. tenuiflorum (14.0mm), combination without worms, combination, C. citratus and O. sativa. Nystatin produced a zone of inhibition of 10mm. The results indicate that vermiwash is not simply an organic alternative to more traditional chemical fungicides, but it may in fact be a better and more effective product in treating certain fungal plant infections, particularly A. alternata.

Keywords : vermiwash, earthworms, soil, bacteria, alternaria alternata, antifungal, antibacterial
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