

## **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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