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Role of endophytes in bio-composting and biopesticide to enhance organic farming

Miriam Muthoki Mbilu

Jomo Kenyatta University of Agriculture and Technology, Kenya

Use of synthetic fertilizers and pesticides has posed a serious negative impact on various forms of life and the environment as well creating demand for natural sources of agricultural chemicals, one of the sources being endophytes. Endophytes are microorganisms living in cells and tissues of plants without causing diseases. Both the endophyte and the host plant experience a symbiotic mode of nutrition whereby the endophytes get shelter and nourishment from the host plant and in return they increase the ability of the host plant to resist diseases and in nutrients uptake. Endophytes inhabiting various plant species are able to produce bioactive compounds which can be used in agricultural, pharmaceutical and food industries. Such compounds include alkaloids, terpenoids, steroids, quinones, flavonoids, phenols, tannins, anthraquinones, phenolic acids, and peptides. Other bioactive compounds include naphthalene which is an insect repellent, phytohormones which enhance plant growth, enzymes useful for the bioconversion process and decomposition of organic matter, pigments which can act as natural food colorants. Some endophytes have been reported to have antagonistic activity against plant pathogens and ability to control plant-parasitic nematodes. My findings on antimicrobial bioactive compounds produced by endophytic fungi isolated from medicinal plant *Warburgia ugandensis* indicate that *Phomopsis mali*, *Alternaria alternata*, and *Fusarium oxysporum* extracts have antimicrobial activities against *Candida albicans*, *E. coli* and *Staphylococcus aureus* hence can be a good source of both antibiotics and antifungals. The fungal extracts had saponins, tannins, alkaloids, flavonoids, steroids and glycosides phytochemicals after the preliminary phytochemical screening. In conclusion, endophytes have biopesticide and bio-composting potential.

Biography

Miriam Muthoki Mbilu completed her first degree in Biomedical Science and Technology at the age of 25 years from Egerton University (Kenya). She worked as an untrained secondary school teacher handling both Chemistry and Biology for one year after her first degree. She later worked as a research assistant in Egerton University, Division of Research and Extension for one year before going for her post-graduate studies. She is currently a masters student (in her final academic year) in Jomo Kenyatta University of Agriculture and Technology doing MSc in Infectious Diseases and Vaccinology. She has a passion for Mycology and always willing to take up anything which will help shape her up as an upcoming mycologist. She has managed to do one publication so far.

mirriammuthoki@gmail.com

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