

Morphology and natural population dynamics of mycorrhizal fungi in rhizosphere of kush (*Desmostachya cynosuroides*)

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ABSTRACT

Soil samples were collected from the rhizosphere of kush (*Desmostachya cynosuroides*) from the different locations of the N.D.U.A.T. campus to evaluate the population dynamics of VA mycorrhiza. Root colonization ranges between 55 to 85% whereas spore population varied from 69 to 97 in kush. These VAM fungi were identified as *Glomus mosseae*, *Glomus fasciculatum*, *Sclerocystis rubiformis*, *Sclerocystis sinuosa*, *Acaulospora trappei*, *Acaulospora longula*, *Glomus microcarpus*, *Glomus aggregatum* and *Endogon pisiformis*, however *Glomus mosseae* was found most dominant. Physico-chemical properties of the soil especially pH, organic carbon, available nitrogen, phosphorus and potassium influence the population dynamics and colonization of VA mycorrhiza in kush.

Key words: Mycorrhizal fungi, Kush, Soil properties.

Mycorrhiza (means fungus root) is the term commonly used to denote the symbiotic association between plant root and fungal mycelia. Mycorrhizal plant increase the surface area of the root system and better absorption of nutrient from soil especially where the soil are deficient in phosphorus and other nutrients. Vesicular arbuscular mycorrhizae (VAM) represent the association between fungi and majority of forest trees, agricultural crops and horticultural plants. VAM is a mutually beneficial symbiosis which is ubiquitous in distribution and physiologically unspecialized. Eighty per cent species of angiosperm, hundred per cent of gymnosperms and seventy per cent of the pteridophytes are potentially mycorrhizal (Harley & Harley, 1987). The improved nutrient uptake of VAM is not confined to the phosphate alone. Infection can also help plant to overcome limitation imposed by low mobility of other nutrients in soil such as Zn, Ca, Mg, and Fe, (Swaminathan & Verma, 1979). The VAM fungi may improve the water relation and have also been shown to interact with fungi, bacteria, actinomycetes, viruses and nematode (Lambert et al., 1979 and Mosse 1973) Most of the plants are found to be association with VAM in natural ecosystem though the extent of infection may vary from plant type, soil type and climatic factors (Singh & Prasad, 2006). The association and importance of VAM fungi in agriculture and horticulture is well documented by Gerdemann (1968), Mosse (1973) and Smith & Read (1997). The beneficial effect of mycorrhizal association have been reported in citrus (Menge et al., 1978 and Nemas, 1978) litchi (Pandey

& Mishra, 1971) and banana (Declereck et al., 1995). Kush (*Desmostachya cynosuroides*) is perennial wild grass and become more greenish during summer season when the availability of water is limited, it may be due to the infection of VAM fungi.

No attempts have been made that why the kush become more greenish during the summer season from which source plants are transporting the water. In the present paper, population dynamics and morphology of mycorrhizal fungi in the rhizosphere of kush have been studied at the different locations of NDUAT campus.

MATERIALS AND METHODS

Survey was conducted to collect the mycorrhiza from the different locations of NDUAT, campus to evaluate the natural status and existing population of VAM fungi in the rhizosphere of kush. Soil samples (containing soil and fine roots) from rhizosphere of above plants were dugout with the help of trowel to a depth of 20-25 cm after scraping away the top soil up to 1-2 cm. Samples of the entire root system were obtained (3-4 different sites of the single plant) and mixed together to get single sample for each plant.. The samples were collected in polythene bags and stored at 2°C till their processing.

To assess the colonization of VAM fungi, clearing and staining of root segments were done as the procedure of Phillips & Hayman (1970). The per cent colonization of VAM-fungi was determined under microscope (100 segments) as suggested by (Giovannetti & Nicolson, 1963). Mycorrhizal spores were isolated by wet sieving and decanting technique (Gerdemann & Nicolson, 1963). These spores were mounted in lactophenol and examined