

Response of *Phyllanthus reticulata* Poir. medicinal plant raised through stem cutting using native AM fungi

PUSHPA.K.KAVATAGI AND H.C.LAKSHMAN

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SUMMARY

Sustainability in horticulture or medicinal plants requires balanced and functional microbial inoculation. Indigenous arbuscular mycorrhizal fungal strain *Glomus fasciculatus* was used as stem cuttings of *Phyllanthus reticulata* Poir. The result revealed mixed inoculum of *Glomus fasciculatum* significantly improved seedlings quality index biomass production of shoot and root. This ultimately influenced an increased plant height and decreased root/shoot ratio compare to non inoculated plants. An appropriate quality with native arbuscular mycorrhizal fungus could bring a good quality in the *Phyllanthus reticulata* Poir seedlings at nursery stages, with known quantity of AM spore population and encouraged root colonization of plants.

Key words : Arbuscular mycorrhizal fungi (AMF), *Phyllanthus reticulata* Poir, biomass production, Root/shoot ratio, seedling index

Rhizosphere is the portion of the soil with specialized niche and is the influence of the plant roots, which encompasses the root surface and adhering soil. The root exudates sloughed off cells and decaying roots, stimulate the microbes. The arbuscular mycorrhizal fungi are abundantly found in rhizospheric soil; these fungi are obligate symbionts and have not been cultured on nutrient media. These AM fungi are not host specific although evidence is growing that certain AM fungi may form preferential association with certain host plants (Powell *et al.*, 1985). Different species live together and hyphae of AM fungi inter connect the root system of adjacent plants changing the level of AM Fungal colonization. AMF hyphae can mediate nutrient transfer between plants. The plants benefit particularly through enhanced phosphorus, water, and mineral nutrient uptake, which often result the toxic effect of excessive concent ratios of heavy metals (Ocampo, 1986; Marschner, 1995; Lakshman, 2008).

The soil used to raise seedlings may not contain the optimum population of microbes needed for a healthy rising of seedlings. Bioagmulation with native arbuscular mycorrhizal fungi improves the quality of the seedlings in nurseries (Bagyaraj *et al.*, 1989; Muthukumar *et al.*, 2001).

Phyllanthus reticulata Poir is a perennial important medicinal shrub grows up to 3 feet height commonly

occurs in most part of Karnataka. The erect plant bears numbers branches with oval shaped leaves. The seeds are used in the preparation of Indian ink. Seed part is externally applied to skin disease and leprous sores. The leaf juice is considered to be a good refrigerant and antiscorbutic. A decoction prepared from the leaves is useful for treating bronchitis and gonorrhoea. Seeds are very minute and eaten by ants or insects. Therefore, it can be propagated through stem cuttings. An AM fungal study on this plant is not done as per the literature survey.

Therefore, the present investigation was undertaken to bioaugment the seedling quality of *Phyllanthus reticulata* Poir using native arbuscular mycorrhizal fungal isolates.

MATERIALS AND METHODS

Arbuscular mycorrhizal Spores from the rhizosphere of *Phyllanthus reticulata* Poir, were isolated using the wet-sieving and decanting technique (Gerdemann and Nicolson, 1963). The isolated spores were mass-multiplied following the single spore culture technique on *Chloris gayana* Kunth. They were grown for two months. Shoots of the grass were severed and roots were air-dried for inoculation. An initial inoculum potential of 1250(N) infective propagule per bag, determined by the MPN (most probable number) method (Porter, 1979), having 2kg substrate was used different level of inoculum potential *i.e.*, 1/4N, 1/2N, 1N, and 4N were used along with a control, the inoculum was a mixture of three *Glomus fasciculatum*, *Glomus isolate 2*, and *Acaulspore scobiculata*.

Stem cuttings measuring 5cm of *Phyllanthus reticulata* Poir from the natural habitat brought where

Correspondence to:

PUSHPA K. KAVATAGI, Post Graduate Department of Botany, Microbiology Laboratory, Karnataka University, DHARWAD (KARNATAKA) INDIA

Authors' affiliations:

H.C. LAKSHMAN, Post Graduate Department of Botany, Microbiology Laboratory, Karnataka University, DHARWAD (KARNATAKA)