

VA-mycorrhizal association in arjuna and jamun trees in forest of Bhandara region, Maharashtra, India

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SUMMARY

A field study for VA- mycorrhizal association in about 20 years old Arjuna (*Terminalia arjuna* Roxb.) and Jamun (*Syzygium cumini* Skeels), the tasar food plants, was undertaken in the natural forest of Khapa, Bhandara (Maharashtra) during November –2007. Soil was laterite with acidic pH, ranged between 5.39 to 5.46. All the plants of Arjuna and Jamun were found associated with Mycorrhizal fungi. Root colonization percentage was higher in Jamun (62.45%) than Arjuna (57.20%). However, VAM fungal spores density was more in Arjuna (230/20g dried soil) than Jamun (175/20g dried soil). Root surface was found with appressorium and running external hyphae, some times attached with spores. Different types of fungal spores belonging to genus *Glomus*, *Acaulospora*, *Gigaspora* and *Sclerocysts* were observed in the soil samples, of which *Glomus* species was found dominant in both host plants. Cortical region of the roots possessed arbuscules, vesicles or both in various intensity.

Key words : Vesicular arbuscular mycorrhiza, Arjuna, Jamun.

VAM fungi association in roots of many plant and tree species is known to improved growth mainly because of increased acquisition of phosphorus (P) and other low mobile mineral nutrients like N, K, Zn, Cu, Ca, and Mn (Tarafdar and Praveen Kumar, 1996, Nopamombodi *et al.*, 1987) and synergistic interaction with other beneficial soil micro-organisms such as N- fixers and P-solubilizers (Bagyaraj, 1984). However, informations are meagre on VA-mycorrhizal association in economically important tasar food plants under natural conditions. Therefore, present study was taken up to survey the rhizosphere soil and roots of Arjuna (*Terminalia arjuna* Roxb.) and Jamun (*Syzygium cumini* Skeels), for natural mycorrhizal association before selecting any VA-mycorrhizal fungus for field trials, to use as bio-fertilizer, to increase leaf yield of tasar food plants in field of tasar sericulture.

MATERIALS AND METHODS

Study was carried out at field Campus Khapa of Regional Tasar Research Station, Bhandara, Maharashtra where extensive tasar silkworm rearing is being done by Regional Tasar Research Station and Basic Seed Multiplication and Training Centre for past many years.

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Roots and soil samples from five Arjuna and Jamun plants, of same height and girth and about 20 years old, were collected from rhizosphere. Samples were collected at random at five places on 30th November- 2007 in polythine bags and kept in refrigerator. These samples were processed in the Agronomy Laboratory of Central Sericultural Research and Training Institute, Mysore to quantify VAM fungal spores in the soil and mycorrhizal colonization in the roots. For sporulation soil samples were processed following wet sieving and decanting methods of Gerdemann and Nicolson (1963). To assess the intensity of mycorrhizal colonization, roots were boiled with 10% KOH aqueous solution and stained as per Phillips and Hayman (1970) and Koske and Gremma, (1989). The root segments were randomly picked up and examined under microscope for root colonization. Colonization was quantified following Nicolson's (1955) formula as follows:

$$\text{Root colonization (\%)} = \frac{\text{No. of root segments colonized with VAM fungi}}{\text{Total No. of root segments examined}} \times 100$$

RESULTS AND DISCUSSION

All the plants of Arjuna and Jamun were found to be associated with mycorrhizal fungi. Appressorium (swollen structure) formation was found on the root surface of Jamun which is the entry point of mycorrhizal fungi in to the roots (Fig.1).After entering it forms arbuscules and vesicles (Fig.1 and 2). Subsequently hyphae of mycorrhizal fungi emerge out or remain with in the roots, connected to the external mycelium in rhizosphere and develop fruiting bodies (Fig.1, 6 and 8). Vesicles were spherical or oval shaped within the roots