

Research Paper :

## Effect of AM fungi on seedlings of *Tamarindus indica* L. and *Azadirachta indica* Juss for integrated nursery stock

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### SUMMARY

The health of nursery plants and their productivity are directly linked to soil quality which is intern, is dependent upon the availability of diverse biota supporting stable and healthy ecosystem. The arbuscular mycorrhizal (AM) fungi constitute one of the important bioinoculants directly involved in improving plant growth under reduced fertilizer input. In the present investigation, the quantification of mycorrhization was undertaken on two tree species of *Tamarindus indica* L. and *Azadirachta indica* Juss plants growing in north Kanara district of Dharwad. Mycorrhizal dependency was scanned on these tree species. Most dominant indigenous AM fungal strains were identified. Green house potted experiments were conducted on plant root length, shoot dry weight, leaf area and number of leaves with inoculation of AM fungi, phosphate dosage supply and AM fungi treatment. The result revealed that AM fungi with low phosphate supply, significantly improved seedlings of both tree species at nursery level compared to non-inoculated (control) plants.

### Key words :

*Tamarindus indica* L. and  
*Azadirachta indica* Juss,  
Arbuscular,  
Mycorrhizal fungi,  
Dependency,  
Phosphate dosage

Tropical forests form a source of rich biological diversity with vast array of plants ranging from minute microorganisms to large trees associated beneficially regulating the community and ecosystem functioning. Symbiotic association between microorganisms and higher plants is common and is of great ecological importance in natural and man made biological systems (Lakshman, 2009). The mycorrhizal association plays an important role in P cycling and uptake of phosphate by plants. Mycorrhizal plants are therefore, adapted to cope with nutrient deficient situations or prevent pathogenesis by other organisms.

Mycorrhizal fungi will not prove effective with all plants when the plants have little or no mycorrhizal dependency (Harley, 1989). Variation in mycorrhizal dependency limits the potentiality of the fungus in improving the plant growth performances (Bagyaraj, 2006). The degree to which the tree depends on the fungal symbiont, varies with the inherent nature of tree species and the prevailing environmental conditions, particularly soil fertility. Forest tree species commonly have low rooting densities in soil compared agriculture species. This limits their absorbing ability of immobile soil nutrients (Harley and Smith, 1983). The importance of mycorrhizal association to forest species is therefore related to the extension of absorptive

area beyond the depletion zone, volume of soil explored in search of nutrients and effective up take and transport of nutrients.

The important of mycorrhiza in natural ecosystem is well recognized and studies were conducted with mycorrhizal fungi to improve early tree growth. The indigenous populated AM fungi may be suitable for inoculation purposes (Grove and Le Tacon, 1993; Lakshman, 2008), account of their broad host compatibility, wide distribution and efficiency in improving nutrient absorption and growth. Mycorrhizal fungi may particularly be important for the establishment and early growth of the trees in regions where growth and nutrient uptake are seasonal. Research in this field indicated that improved growth can be obtained with many economically important tree species of forest by inoculating the seedlings with specific mycorrhizal fungi.

The objective of this study is to determine the mycorrhizal dependence of both of these hard wood species which are the essential components of the habitats for the human beings, particularly growing in North Canara district of Western Ghats of Karnataka.

### MATERIALS AND METHODS

In the present study was undertaken at North Canara district of Karnataka. Its

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