

A Survey on VAM Status in Roots of Some Medicinal Plants of Alipurduar, West Bengal

D. BHATTACHARYA, M.R. CHAKRABORTY, N.C. CHATTERJEE AND C. SENGUPTA

International Journal of Plant Protection, Vol. 2 No. 1 : 45-47 (April to September, 2009)

See end of the article for authors' affiliations

Correspondence to :
C. SEINGUPTA,
Department of Botany,
Faculty of Science,
University of Kalyani,
NADIA (W.B.) INDIA

SUMMARY

Arbuscular mycorrhizal status of ten medicinal plants was studied. The AM colonization, spore population and diversity, altered with seasons as well as with plant species. The maximum mycorrhization was noted in *Eclipta alba* (82%) followed by *Sida cordifolia* (80%). The lowest mycorrhizal percentage was found in *Nymphaea laba* (8%) followed by *Adhatoda vasica* (10%). Root colonization was found maximum during rainy season and spore population in rhizosphere soil in winter. The spore composition varied probably due to their variation in sporulation period. The high moisture and temperature evidently affected sporulation.

Key words :

Arbuscular mycorrhiza, Medicinal plant, Mycorrhiza, VAM

Mycorrhiza is a composite structure consisting of fungus and higher plant roots. Mycorrhizal fungi are the beneficial microorganisms that form symbiotic association with fine roots of plants (Aggarwal *et al.*, 2007). The role of vesicular arbuscular mycorrhizal (VAM) fungi in enhancing plant growth and improving host resistance against diseases is well documented (Akkopru and Demir, 2005; Chakraborty and Chatterjee, 2007). They play a significant role in plant growth under conditions of phosphorus limitation and also influence plant community development, nutrient uptake, water relations and productivity. They also influence ecosystem processes by modifying the structure of microbial populations in soil and are also essential components for both re-vegetation of the degraded lands and maintenance of soil structure (Mishra *et al.*, 2008). Medicinal plants are the potential source for discovery of new products and fine chemicals for drug development and the demand of medicinal plants has been increasing rapidly with the consumption of crude drugs. Keeping this in view, the present study reports the VA mycorrhizal association in some medicinal plants that grow naturally in and around Alipurduar, Jalpaiguri district of West Bengal.

MATERIALS AND METHODS

Roots samples of different medicinal plants viz., *Ocimum sanctum*, *Catharanthus roseus*, *Adhatoda vasica*, *Eclipta alba*, *Andrographis paniculata*, *Scoparia dulcis*,

Sida cordifolia, *Nymphaea laba*, *Ipomea obscura*, *Euphorbia nerifolia* were collected from Alipurduar, Jalpaiguri district of West Bengal throughout the year.

Roots samples were washed thoroughly in water separately to free them of any soil particle. The roots were then cut into 1 cm long pieces. Only fine tertiary roots were taken. The root segments were boiled in 10% KOH solution and stained by trypan blue solution following Philips and Hayman (1970). Five observations for each plant species were taken.

Percentage of VAM colonization, presence of vesicle, arbuscle and infected hyphae were recorded in each segment. Percentage colonization of AM infection of root was calculated as follows:

$$\% \text{ of root colonization} = \frac{\text{Number of mycorrhizal root segments}}{\text{Total number of root segments observed}} \times 100$$

Rhizosphere soils taken from the roots of different individual species were used for estimation of spore population. Estimation of spore population was done by wet sieving and decantation technique (Gerdemann and Nicolson, 1963). One hundred gm of dry soil was mixed in 500 ml of water in large beaker with the help of a brush till all the soil aggregates dispersed to leave a uniform suspension. The heavier particles were allowed to settle for a few minutes and the liquid was decanted through a sieve fine enough to remove larger particles of organic matter, but coarse enough to allow the desired spores to pass through. The suspension that passed through the sieve

Accepted :
January, 2009