

Effect of AM fungus inoculation with additional phosphorus on the growth of *Brassica juncea* Linn. saplings

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SUMMARY

A comparative study was made to analyse the effect of arbuscular mycorrhizae (AMF) and addition of phosphorus (P) on the growth parameters of *Brassica juncea* variety under green house conditions. In general, due to AMF association, the survivability of the saplings was very high as compared to saplings grown with added P and under control conditions. The growth parameters such as height of sapling, no of leaves/sapling, fresh and dry weight of leaves and shoots/sapling were found increased due to the influence of AMF fungi. Moisture content and major essential nutrients (NPK) were also found more in the leaves of AMF associated saplings. The percentage of root colonization due to AMF inoculum was higher (46.36%) as compared to uninoculated saplings (19.58 per cent). Based on the results, it can be concluded that the growth response of *Brassica juncea* saplings to the treatment of AMF inoculation was significantly superior to that of treatment of P addition and control.

Key words : Phosphorus, Semi-arid fungi, (AMF), Arbuscular, Mycorrhizal fungi, *Brassica juncea*.

The arbuscular mycorrhizal (AMF) association is known to improve plant growth through better uptake of nutrients, tolerance to drought and salinity (Harley and Smith, 1997), ability to withstand transplant shock, resistance to root pathogens and by boosting synergistic interaction with beneficial soil micro-organism; such as N - fixers and P - solubilisers (Marwaha, 1995). Further, the mycorrhizal mutualistic symbiosis between plant roots and soil fungi is known to play a significant role in P cycling and uptake of P by plants (Barrow and Rocardri, 1977). Among mycorrhizae, AM fungi, a fungal biofertilizer is the most promising and extensively used to enhance the growth in different crop plants (Marwaha, 1995; Inchal and Lakshman, 2006). AMF biofertilizer is a natural product carrying living micro-organisms derived from the plant root or cultivated soil. As such, no harmful effect on soil fertility or plant growth is generally discernible (Sen, 2005). The beneficial effects of AMF have been reported in many leguminous plants and other crop plants (Mamtha and Bagyaraj, 2001). There are a few reports on the influence of AMF on the growth and nutrition of mulberry plants (Hetrick, 1989) and its effect on disease incidence on mulberry (Scheriner and Belthienfalvay, 1995). But studies on the response of drought tolerant variety to the AMF

inoculum and additional incorporation of phosphorus to the plants of *Brassica juncea* has not yet been reported. Therefore, *Brassica juncea* has been taken up to study its response to AMF inoculum and addition of phosphorus under green house conditions of Department of Botany of Karnatak University, Dharwad.

Brassica juncea L. Czern Coss Large var. is important oil yielding plant, commonly called as mustard. It belonging to family cruciferae. It is grown in *rabi* season as a mixed crop with other millets. Seeds yield good cooking edible oil. Plants are susceptible to aflatoxin contamination. Early workers (Sanders, 2002) proved, the absence of AM fungal association in plants of cruciferae.

MATERIALS AND METHODS

A total of 300 experimental pots of *Brassica juncea* variety were planted for each of the two treatments viz., (i) AMF (*Glomus mosseae*) and (ii) addition of phosphorus and also for control. For each treatment, 12 earthen pots (25 × 25 cm) were prepared and these pots were maintained in green house conditions. Each contained 4kgs of sterilized sandy loam soil. For AMF treatment, 15 g of mixed inoculum was placed just below the 5cm in experimental pots. For P added treatment, phosphorus at 2g was applied after 30 days of planting. Control was maintained without application of AMF and phosphorus. The common dose of urea fertilizer (at 1.05 g urea/pot) was applied to all the pots after two months of planting. The plants were irrigated once in 2 days and the plants were allowed to grow for 180 days in the pots. Data were recorded periodically at 60, 120 and 180 days after planting

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