

Growth response of *Brassica campestris* L. var Sarson (Mustard) to Vesicular Arbuscular Mycorrhizal colonization

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Abstract

In the present study growth response of *Brassica campestris* L. to inoculation of *Glomus fasciculatum* was taken. The present study indicates that mycorrhizal inoculation either resulted in higher survival and growth of mustard plant of influenced growth by modifying the physiology of the plants.

In India fat and edible oil are mostly derived from seed crops such as groundnut, Sunflower, Safflower, Sesame, mustard and rapeseed. Most of these crops are generally grown in nutrient deficient soils under rain fed conditions. Recent research on plant nutrition and Vesicular Arbuscular Mycorrhizal (VAM) fungi have demonstrated that these fungi play a major role in the uptake of nutrients from the marginal soils besides biological suppression of soil-borne plant pathogens^{1,6,9}. VAM fungi are wide spread in cultivated soils throughout the world. Importance of these fungi particularly in phosphorus uptake of plants by extending the absorption of root system has been well recognized. Inoculation of plants with selected VAM fungi has been shown to stimulated growth and yield of several crops^{8,10}.

Earlier studies on Growth and Nutrient

uptake in rape seed and mustard, their positive response to inoculation with VAM fungi have been reported^{4,2}.

The present study was undertaken to quantify the response of mustard (*Brassica campestris*) to the VAM Endophyte *Glomus fasciculatum* in a nutrient-deficient soil. After inoculating the mycorrhizal treatments with the fungal endophyte *Glomus fasciculatum*, mustard seeds were sown in pots (24cm) containing nutrient-deficient sterilized (15lb:p.s.l. for 2 hrs, thrice on alternate days) soil. The observations were made for mycorrhizal density, plant height, average branch length, total dry weight of root and shoot, pod weight yield and nutrient content (N,P and K). Mycorrhizal density in the roots of test plants was recorded using the scale (0 - 4) given by Jalali and Domsch⁶ after clearing the roots in

10% KOH and stained in trypan blue⁷. N, P and K concentration of the plants were determined by the standard methods followed by Jackson³.

It is apparent from table-1 that *Glomus fasciculatum* inoculation induced significant increase in plant height, average branch length, total dry matter production of root and shoot, total pod weight and yield, at all the stage of plant growth as compared to control VAM endophyte colonized extensively

(1.74-2.00) the root system of mustard.

The results in Table-2 indicate that mycorrhizal inoculation increased nitrogen, phosphorus and Potassium concentration of the shoot and root significantly compared to uninoculated plants of these nutrients, the pronounced increase was observed in the uptake of Phosphorus. These studies indicate that mycorrhizal inoculation either resulted in higher survival and growth of mustard plant or influenced growth by modifying the physiology of the plants.

Table-1. Plant height and total dry matter production in mustard, influenced by vesicular arbuscular mycorrhizal inoculation

Treatment	Mycorrhizal (0-4 scale)		Plant height (cm.)			Branch length (cm.)		Dry matter g/plant		Total Pod weight g/plant	Yield g/plant
	60	90	50	70	90	70	90	shoot	root		
Days	60	90	50	70	90	70	90	shoot	root		
Myc	1.7	2.0	59.4	68.4	83.1	17.1	22.9	1.15	.31	1.41	0.77
Control	0.0	0.0	47.3	57.1	70.9	9.5	15.5	.62	.15	.83	.40
C.D. 5%	-	-	5.7	7.3	5.5	4.6	4.3	.30	.07	.31	.13

Myc=Mycorrhizal inoculation

All values are means of five replications

Table-2. Effect of VA-mycorrhizal inoculation on the nitrogen, phosphorus and Potassium concentration in mustard. (*Brassica campestris*)

Treatments	Nitrogen (%)		Phosphorus (%)		Potassium (%)	
	Shot	Root	Shot	Root	Shot	Root
Myc	2.29	1.93	0.31	0.32	0.82	1.65
Control	1.92	1.56	0.25	0.26	0.75	1.46
C.D. 5%	0.12	0.06	0.01	0.011	0.02	0.04

Myc=Mycorrhizal inoculation

All values are means of three replications

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