J. Phytol. Res. **22**(1) : 175-176, 2009

ARBUSCULAR MYCORRHIZA FUNGI FROM RHIZOSPHERE SOILS OF CHICKPEA AND WHEAT

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Arbuscular mycorrhiza fungi associated with chickpea and wheat at vegetative, flowering and harvesting stages were investigated. A total of eight species belonging to four genera *Acaulospora, Gigaspora, Glomus* and *Scutellospora* were found in the rhizosphere soil of both plants. *Glomus,* followed by *Acaulospora,* was dominant. *Scutellospora* was found only at the harvesting stage. The number of species associated with chickpea was more than in wheat. Spore density was maximum at vegetative growth stage of plants. Chickpea rhizosphere region had more spore density. Distribution of AM species in the rhizosphere zone seems to be influenced by physiological stage and type of plant. Physico-chemical characteristics of soil did not show any correlation with the species occurrence and distribution in the rhizosphere soils.

Keywords: Arbuscular mycorrhiza fungi; Chickpea; Rhizosphere; Wheat.

Vesicular Arbuscular Mycorrhizal fungi are ubiquitous and establish mutualistic association with most of the higher plants[1,2]. The association is beneficial to plant as AMF improves uptake of P,Cu,Zn, water relations, disease resistance in plants, withstandingg water stress[3], growth even in soils of phosphate deficiency, low to moderate fertility, increase in biological nitrogen fixation and hormone productions[1,4]. The VAM fungi also change the dynamics of microbial population in the rhizosphere region[5]. The association of VAM fungi with different host plants has been studied by several workers[6-11]. The biodiversity of VAM fungi and their role in improvement of plant growth was reported by Geredmann[12] and Manoharachary[13]. In the present investigation AM fungi from the rhizosphere soils of Wheat and Chickpea were isolated and identified.

The rhizosphere soil samples were collected from the vegetative, flowering and harvesting stages of chickpea (*Cicer arietinum)* var. Vishal and wheat var. 496. The sample were stored separately in polythene bags for experimental purpose. The physico-chemical properties of soil samples were also found out.

The VAM spores were isolated by wet sieving and decanting technique[14] and mounted in PVLG. The spores were identified following Raman and Mohankumar[15] and Schenck and Perez[16]. The number of spores per 100 grams of soil sample was also estimated.

A total of eight AM species (*Acaulospora* 2 species, *Gigaspora* 1 species, *Glomus* 4 species and *Scutellospora* 1 species) belonging to four genera were isolated from the rhizosphere soil samples of two plants collected at different stages of plant growth. Seven and six species were present in the rhizosphere soils of chickpea and wheat, respectively. *Acaulospora laevis, Gigaspora gigantea Glomus fasciculatum, Glomus mosseae* and *Scutellospora pachycaulis* were found in the rhizosphere soils of both plants. *Acaulospora bireticulata* and *Glomus hoi* could be isolated from the rhizosphere soil of chickpea and *Glomus geosporum* from that of wheat, plant. The species *Scutellospora pachycaulis* was found in the rhizosphere soils of both plants at harvesting stage only. *Glomus,* followed by *Acaulospora,* was found to be dominant genera distributed in the rhizosphere soils of chickpea and wheat (Table 1). Similar observations were made by Dwivedi *et al.*[9] and Vyas *et al.*[11].

The number of AM spores were more in the rhizosphere soil of chickpea than of wheat. Maximum number of AM spores were isolated from rhizosphere soils of plants during vegetative growth stage (Table 2).

Acknowledgement
The author is thankful to Principal, Padmashri Vikhe Patil College, Pravaranagar for encouragement and providing all the necessary facilities.

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Table 1. AM fungi isolated from rhizosphere soils.

S.No.	AM Fungi	Rhizosphere soil sample					
		Chick pea			Wheat		
		A	B	C	A	B	C
1.	*Acaulospora laevis*	+	+	+	+	+	+
2.	*A. bireticulata*	+	+	-	-	-	-
3.	*Gigaspora gigantea*	-	+	+	-	-	+
4.	*Glomus fasciculatum*	+	+	+	+	+	+
5.	*G. geosporum*	-	-	-	+	+	+
6.	*G. hoi*	+	+	+	-	-	-
7.	*G. mosseae*	+	+	+	+	+	+
8.	*Scutellospora pachycaulis*	-	-	+	-	-	+

+= Present - = absent

Table 2. Physico-chemical properties of rhizosphere soils.

S.No.	Parameter	Rhizosphere soil sample					
		Chick pea			Wheat		
		A	B	C	A	B	C
1.	Soil colour	Black	Black	Black	Black	Black	Black
2.	Soil pH	7.2	7.2	7.4	7.5	7.3	7.1
3.	Water holding capacity	42	39	41	45	42	41
4.	No. of spores/ 100 grams of soil	218	206	190	184	178	174

A=Vegitative stage, B = Flowering stage, C= Harvesting stage.

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