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Association of arbuscular mycorrhizal fungi in some angiospermic plants of Maharashtra, India

Prakash P.Sarwade[1], M. B. Kanade[2], M. G. Ambuse[3] and U.N.Bhale[3]

[1]Department of Botany, S.G.R.G. Shinde Mahavidyalaya Paranda Dist. Osmanabad (M.S) India 413502
[2]Department of Botany T.C. College Baramati Dist-Pune 413102, India
[3]Department of Botany, Arts, Science and Commerce College, Naldurg Dist. Osmanabad, India

Abstract
The result showed that all the seven angiospermic plants viz. *Morinda citrifolia L., Carica papaya L., Lowsonia inermis L, Mimosa pudica L., Tamarandus indica L., Bauhinia recemosa* Lamk and *Indigofera duthiei* Drum. had AM fungal association in the roots and spore population in the rhizosphere soil. However, maximum percent root colonization of AM fungi was observed in *Carica papaya* (80 %) followed by others, while minimum in *Lowsonia inermis* (20%). *Mimosa pudica* (305) showed more spore density whereas less in *Morinda citrifolia* (59). Total four AMF was identified up to species level in which *Glomus* spp were found dominate followed by *Acaulospora* spp., *Sclerocystis* spp and *Entrophosphora* spp were found poorly distributed.

Keywords: Angiospermic plants, Root colonization, AM fungi.

INTRODUCTION

Arbuscular mycorrhizal fungi (AMF) are obligate symbionts that form associations with the roots of most terrestrial plants (Smith and Read 2008 [6]). AMF represent an important component of the soil microbial community that can significantly affect plant growth and soil stability. Since this interactions are able to alter ecosystem productivity and plant diversity (Gange et.al. 1999[1]).

Morinda citrifolia L., Carica papaya L., Lowsonia inermis L, Mimosa pudica L., Tamarandus indica L., Bauhinia recemosa Lamk and *Indigofera duthiei* Drum. are multipurpose plant species commonly found in Maharashtra state. They are fast growing species and important source of medicine, fuel and timber yielding plants. Hence a study was to obtain information on AM fungal status around Osmanabad district in Marathwada region.

MATERIALS AND METHODS

Roots and rhizosphere soil samples of selected angiospermic plants were collected and in each plant three replications were taken. Root samples were brought to the laboratory which were then washed in tap water and cut in to 1 cm pieces in length. Root samples were cleared and stained using Phillips and Hayman (1970) [4] technique. Root colonization was measured according to the Giovannetti and Mosse (1980) [2] method. Hundred grams of rhizosphere soil samples were analyzed for their spore isolation by wet sieving and decanting method Gerdmann and Nicolson, (1963) [3].Identification of AM fungal species by using the Manual for identification Schenck and Perez (1990) [5].

RESULTS AND DISCUSSION

The data of percent of root colonization and spore number associated with seven different plants are presented in table 1 Fig. 1. The result shows that all the tested plants were colonized by AMF. Maximum percent of colonization were found *Carica papaya* (80 %) than other six plants whereas, minimum percentage was found in *Lowsonia inermis* (20 %). Hyphal and vesicular types of colonization were found in roots of different plants. Hyphae were almost common in all tested plants. More number of spores (305) was observed in rhizosphere soil of *Mimosa pudica* than *Morinda citrifolia, Carica papaya, Lowsonia inermis, Mimosa pudica, Tamarandus indica, Bauhinia recemosa* and *Indigofera duthiei*. Total four genera were observed viz. *Glomus* spp, *Acaulospora* spp *and Gigaspora* spp. highest number of AMF species was associated with *Mimosa pudica* while the lowest number of AM fungal species was recorded in other plant species. Among three AM fungal species *Glomus* spp was dominant whereas *Sclerocystis* spp, *Entrophosphora* spp and *Acaulospora* spp were poorely distributed.

Among the three genara *Glomus* spp was found much more frequent than other genera. In our earlier work was observed the dominance of *Glomus* spp in the rhizosphere soil of the other plants (Sarwade et al., 2011[7]). The result obtained from the study suggests that the colonization percentage and number of AM fungal spores differ with different seven angiospermic plants.

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*Corresponding Author

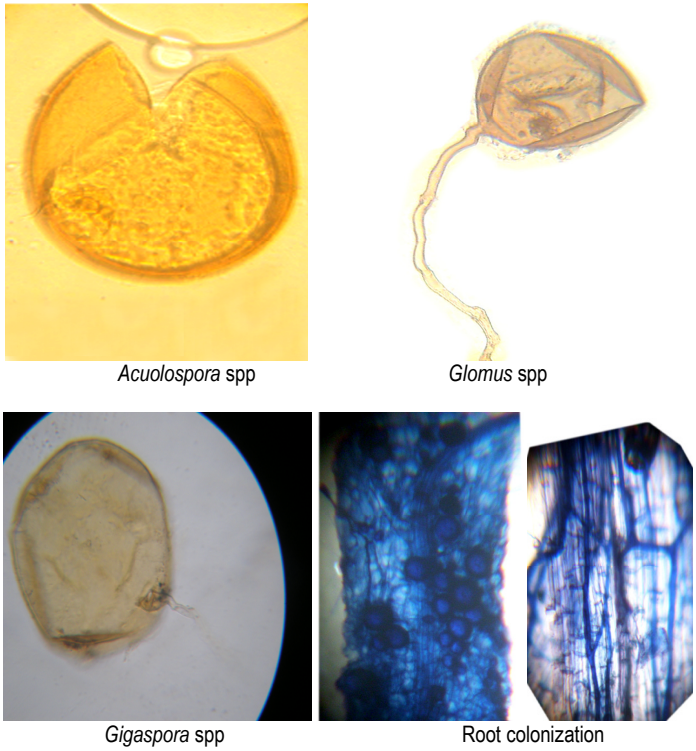
Dr. P.P.Sarwade
Assistant Professor & Head, Dept. of Botany, S. G. R. G. S, Mahavidyalaya Paranda, Dist. Osmanabad,(M.S.) India.

Tel: +91-9850547892; Fax: +91-2477202975
Email: ppsarwade@gmail.com

Table 1. Percent root colonization and spore population in angiospermic plants.

Sr No.	Plant species	Family	*Colonization (%)	Types of colonization	*Spore population	AM fungal Species
1	*Indigofera duthiei* Drum.	Fabaceae/ papilionaceae	60	VH	139	*A spinosa, E. hexagoni, G. mosseae, G.macrocarpum.*
2	*Bauhinia recemosa* Lamk.	Caesalpinaceae	32	VH	105	*E. hexagoni, G. fasciculatum, G.halan.*
3	*Tamarandus indica L.*	Caesalpinaceae	36	H	97	*A spinosa, G.geosporum, G.clarum, Sc. sinuosa.*
4	*Mimosa pudica L.*	Mimosaceae	40	VH	305	*A. scrobiculata, A thomii, E. hexagoni, G. ambisporum, G. intararadices.*
5	*Lowsonia inermis L.*	Lythraceae	20	H	297	*G. multicaule, G. geosporum, G. mosseae*
6	*Carica papaya L.*	Coricaceae	80	VH	275	*E. hexagoni, G. mosseae G. austral, Sclerocystis sinuosa.*
7	*Morinda citrifolia L.*	Rubiaceae	28	VH	92	*E. hexagoni, G. multicaule, G. constrictum.*

* Mean of three samples, H- Hyphae V- Vesicular, G-*Glomus*, A-*Acaulospora*, *Sc.-Sclerocystis*, E-*Entrophosphora*



Acuolospora spp *Glomus* spp

Gigaspora spp Root colonization

Fig 1. Some AM fungal spores and root colonization associated with some angiospermic plants.

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