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ARBUSCULAR MYCORRHIZAL FUNGI (*AMF*) SPECIES ASSOCIATION WITH *PHOENIX SYLVESTRIS* OF BHUJODI NONAGRICULTURAL SITE IN THE SEMI-ARID REGIONS OF KACHCHH DISTRICT, GUJARAT, INDIA

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ABSTRACT

Date palm is an economically important plant in dry lands of the world, here is anapproach towards investigating the Arbuscular Mycorrhizal Fungi diversity and their association with the date palm in Kachchh. The importance lies to the understanding of the root colonization and spore identification with relation to theseasonal change. In the present work soil of non-agricultural land has been takeninto consideration to understand the relevance.

Keywords: *Date palm, Arbuscular Mycorrhizal Fungi, Kachchh.*

INTRODUCTION

Arbuscular Mycorrhizal fungi do interact symbiotically with the roots of around 90% of the land plants present on earth forming different types of mycorrhizae. The total number of mycorrhizal fungi involved in this symbiosis still remains unknown, but in order to evaluate their diversity it isfirst necessary to make an identification of fungi.

Soil microorganisms such as arbuscular mycorrhizal fungi (AMF or AM fungi) represent a key link between plants and soil mineral nutrients. Thus, they are collecting growing interest as natural fertilizers. AMF are obligate symbionts, belonging to the phylum Glomeromycota (Schüßler et al.,2001), which form mutualistic symbioses with about 80% of land plant species, including several agricultural crops. They provide the host plant with mineral nutrients and water, in exchange for photosynthetic products (Smith and Read, 2008).

METHOD

The present study area is a non-agricultural land of a town Bhujodi (23°13'25" N and 69°44'25"E) of Kutch district of Bhuj Taluka. Kutch it is surrounded by the Arabian Sea in the west and bythe Gulf of Kutch in south and southeast and by Rann of Kutch in north and northeast. The soil

samples were collected at the depth of 45cm in a zip-lock bag to maintain the moisture content andwere immediately taken to the lab for further work, and the physical parameters result were takeninto consideration on the basis of India soil standards of agriculture. 100 gm soil was taken for thespore analysis and the spores were identified on the basis of (Gerdemann and Nicolson, 1963) method the root sample were collected in glass bottles for the analysis of root colonization (Phillipsand Haymen, 1970).

Identification was done on the basis of spore colour, size, surface ornamentation and wall structurewith the reference to the description provided by the International Collection of AMF

(http://invam.caf.wvu.edu) [1] and the species description given by Schench and Perez (1988). Thepermanent slides were mounted in polyvinyl-lacto-glycerol and were stored.

RESULTS

Table1. Parameters considered for analysis

Sr no.	Parameters	Site (Bhujodi)
1	pH	8.0
2	% Moisture content	6.0
3	% Water holding capacity	58.0
4	Bulk density	1.35
5	% Porosity	58

The result shows the presence of 80% of root colonization

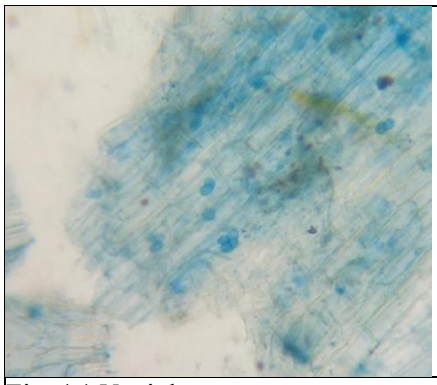


Fig. (a) Vesicles

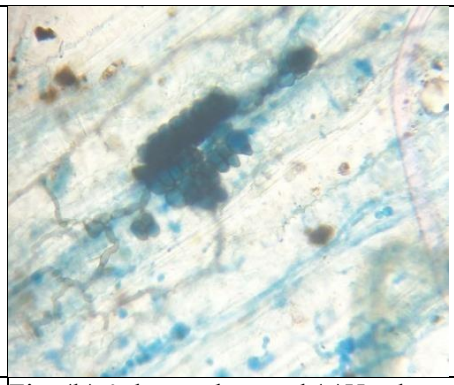
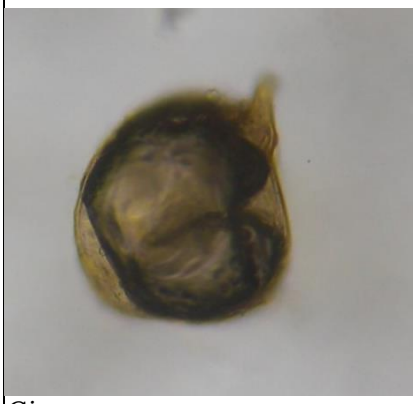
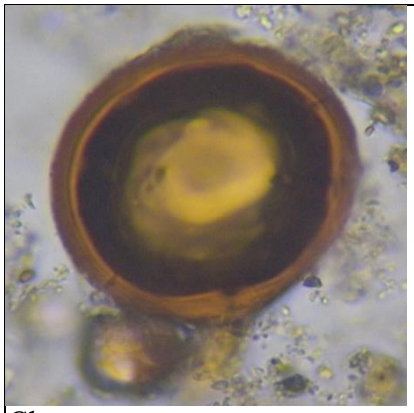


Fig. (b) Arbuscules and (c)Hyphae (arrows)

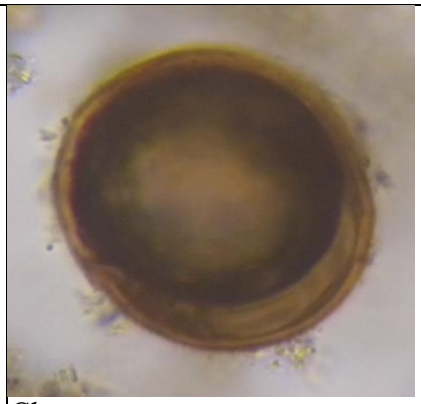
Glomus mosseae



Gigaspora sp.



Glomus monosporum



Glomus sp.

Table 2. Spores

The result showed that the soil was moderately alkaline. The % moisture content of the sample is
6.0 and % Water holding capacity observed was 58 %. The bulk density of soil was found to be
1.35 gm/cm^3 respectively. Also, the porosity of the sample was 58. Studies indicate that, Kutch provides suitable factors like a well-drained, deep, sandy type of soil having adequate aeration (12%) with a bulk density of 1-1.5 g/cm3 and water holding capacity of at least 15% and also thebulk density higher than 1.6 gm/cm^3 tend to restrict root growth. Bulk density is inversely proportional to pore space.

Seven species of Arbuscular Mychorrhizal Fungi were found from the study area. The genus *Glomus* was represented by five species: *Glomus mosseae* (Nicol and Gerd.) Gerd.and Trappe, *G.fasciculatum* Gerd. And Trappe emend.Walker and Koske, *G. formosanum*, *G. aggregatum*Schenck and Smith emend. Koske. and *G. monosporum.* with the presence of *Gigaspora spp.* and *Acaulospora spp.* *Glomus mosseae* were the most abundant and frequently observed AMF. **Table 3.** Result of spore density according to species.

Sr no.	Species	Spores density
1	*Glomus mosseae*	86
2	*Glomus aggregatum*	09
3	*Glomus fasiculatum*	03
4	*Glomus formosanum*	12
5	*Glomus monosporum*	02
6	*Gigaspora spp*	24
7	*Acaulospora spp*	18

CONCLUSION

A total of 154 spores were observed in 10 gm of soil from the site. At the Sample 1site, spore densityreached 408 spores/100 g of soil, whereas spore density reached 244 spores/100 g of soil at the Sample 2 site also found a similar result. The Arbuscular mycorrhizal association is a remedy forsustainable agriculture and in the current scenario, use of pesticides and chemicals have increased which creates an ultimatum for the existence of the arbuscular mycorrhizal species. So, this workgives a report on the existence of mycorrhizae in the nonagricultural land of semi-arid region in parts of Kachchh region.

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