**International Journal of Botany Studies**
**www.botanyjournals.com**
**ISSN: 2455-541X**
**Received: 13-11-2021, Accepted: 28-11-2021, Published: 14-12-2021**
**Volume 6, Issue 6, 2021, Page No. 1062-1063**

# Status of mycorrhizal colonization in the roots of *Commiphora mukul* Engl (Gugul)

**Sarika N Sangekar**
Department of Botany, Yogeshwari Mahavidyalay, Ambajogai, Maharashtra, India

**Abstract**
The present paper deals with the study of mycorrhizal colonization and the abundance of spores in the rhizospore soil of plant *Commiphora mukul* Engl (gugul), belonging to the family Burseraceae. This plant have significant medicinal properties. Roots of selected plants and rhizospheric soil were collected in the month of November 2021, from the College campus of Yogeshwari Mahavidyalay, Ambajogai in Maharashtra. Results of present research work reveals that, roots of selected plants shows colonization of mycorrhizal hyphae with arbuscules. On the basis of occurrence, Genus Acalospora was found dominant which is followed by *Glomus.* Analysis of rhizospore soil shows less number of chlymadospore.

**Keywords:** mycorrhiza, arbuscules, colonization, rhizospheric soil

## Introduction
Mycorrhiza is a great interdependent symbiotic association between the hosts plant and the fungus where the host plant receives the mineral nutrients, while the fungus obtains carbon compound from host plant (Harley and Smith, 1983) [6]. Mycorrhiza are mostly related with the secondary roots of the plant and the association is found in the cortical region of the roots. The cortical region is the portion present in between the epidermis and the vascular tissues of the plant. Due to presence of mycorrhiza, the host plant forms highly branched root system and the hyphae of mycorrhiza grow from root to soil which enable the roots to remains in contact with increased area of soil surface, association of mycorrhiza is found in large number with Bryophytes, Pteridophytes, and Gymnosperms and Angiosperms all over the world (Gerdemann, 1968). The arbuscular mycorrhizal fungi mainly increases the surface area of root through which water and mineral nutrient uptake get increased. For present study *Commiphora mukul* Engl (gugul). plant was selected. It is shrub and widely used in Ayurvedic medicines such as nervine tonic, liver tonic etc. now a days gugul gum resin which is extracted from plant is used in atherosclerosis, lowering high cholesterol, and hardening of arteries, in skin diseases and also in weight loss. It is widely used for its anti-inflammatory properties.

## Materials and Methods
Collection of roots and rhizospheric soil sample of *Commiphora mukul* Engl (gugul). was done from Botanical garden of Yogeshwari Mahavidyalay Campus, Ambajogai, Dist. Beed in the month of November 2021.

From the selected site the rhizospheric soil along with the roots of the host plants were collected. The host plant was thoroughly washed with distilled water after brought to the laboratory. The roots of the host plants were cut into small pieces of about 1-2 cm and collected in bottle for further mycorrhizal study. The rhizospheric soil was also separated and collected in sterilized polythene bag. Root samples were stored in FAA for 10. Minutes then washed with distilled water 3-4 times to remove the FAA. These roots were transferred in in glass vials which contain 10% KOH, these glass vials were autoclaved for about 15 minutes at $121^0$c. After autoclaving KOH solution was removed and roots were washed with distilled water. These washed root samples were surface covered with 1% HCL for 5-10 minutes, after that roots were washed with distilled water and stained with cotton blue for overnight (Philips and Hayman, 1970) [8]. The percentage of mycorrhizal root colonization was calculated by using the following formula (Giovannetti and Mosse. 1980) [4].

$$\text{Percentage of root colonization} = \frac{\text{Number of infected root pieces}}{\text{Number of root segments screened}} \times 100$$

The spores of arbuscular mycorrhizal fungi from rhizospheric soil were separated by the wet sieving and decanting method proposed by Gerdemann and Nicolson (1963) [3]. The estimation of spores was done according to Gaur and Adholeyas (1994) [2] method. Whatmann No.1 filter paper was folded into two equal parts again followed by second fold, which forms four equal parts of paper. Later, such spore receiving filter paper was carefully taken in Petridis and was observed under stereo zoom binocular microscope in column by column in vertical direction to count the spores.

## Results and Discussion
The roots of *Commiphora mukul* Engl (gugul). Showed 10% mycorrhizal root colonization, hyphae and arbuscules were present whereas vesicles were absent. The collected rhizospheric soil was analyzed for spore population and its density. The observed spore density was 140 spores per 10 gm of soil and spore population was mainly with Glomus sp., Acaulospora sp. And Gigospora sp. Rhizospore soil shows presence of chlymadospore. Similar observations were made by Mulani and Prabhu (2002) [7], and Prabhu (2002) [9]. They observed maximum number of chlymadospore in the root zone soil of *Dipcadi saxorum*. The murmy soil with low humidity and high temperature fevers more chlymadospore formation. Harinikumar and Bagyaraj (1988) [5] and Bagyaraj (1995) [1] also reported abundance of mycorrhizal spore in tropical soil. Pawar &

Kakde (2012) recorded eight species of Glomus in roots of medicinal plants. These are G. *aggregatum, G. boreale, G. fasciculatum, G. geosporum, G. heterosporum, G. segmentatum, G. tortuous and, G. radiatum.*

## Conclusion

Roots of *Commiphora mukul* Engl (gugul). shows colonization of Mycorrhiza. Hyphae and arbuscules were found dominant, rhizospore soil shows presence of chlymadospore

**Table 1:** Mycorrhizal colonization in roots in rhizospheric soil of Commiphora *mukul*

| Sr.no | Features | Results |
|---|---|---|
| 1 | Types of soil | Black loamy |
| 2 | Colonization of Mycorrhiza | present |
| 3 | Status of Mycelium | Abundant |
| 4 | Status of Arbuscules | Abundant |
| 5 | Status of vesicle | Abundant |
| 6 | Percentage of Root colonization by Mycorrhiza | 10% |
| 7 | Spore Density in rhizospheric soil | 140 spores/10gm of soil |
| 8 | Mycorrhizal genera observed | Glomus sp. Acaulospora sp. Ggigaspora sp. |

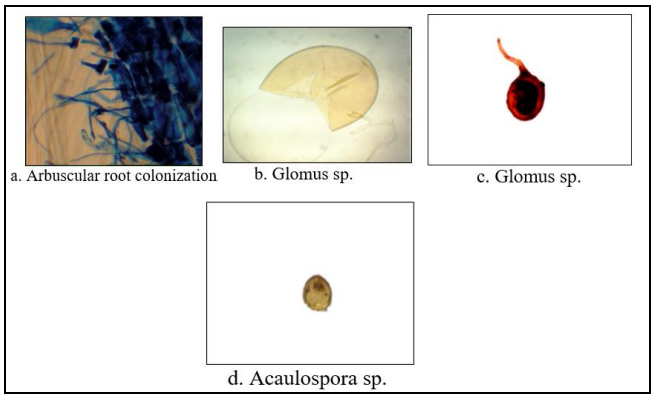


**Fig 1**

## References

1. Bagyaraj DJ. Influence of agricultural practices on vesicular arbuscular mycorrhizal fungi in soil. J. Soil Biol. Ecol,1995:15(2):109-116.
2. Gaur A, Adholeyas A. Estimation of VAM spores in the soil–a Modified method. Mycorrhiza News,1994:6:10-11.
3. Gerdemann JW, Nicolson TH. Spores of mycorrhizal Endogone species extracted from the soil by wet sieving and decanting. Trans. Br. Mycol. Soc,1963:46:235-244.
4. Giovannetti M, Mosses B. An evaluation of techniques for measuring mycorrhizal infection in root vesicular arbuscular mycorrhizal infection in roots. New phytol,1980:84:89-500.
5. Harinikumar KM, Bagyaraj DJ. The effect of season on VA maycorrhiza of Leucaena and Mango in a semi-arid tropic. Arid Soil Res. Rehabil,1988:7:139-143.
6. Harley JL, Smith SE. Mycorrhizal Symbiosis. Academic Press, Toronto. Mahadevan, N. Raman & K. Natarajan, 29-31, 1983, 53-55.
7. Mulani RM, Prabhu RR. A seasonal variation in Vesicular Arbuscular Mycorrhizal (VAM) colonization in the roots of Dipcadi saxorum Blatt. And chlymadospore in the rhizospheric soil from Mumbai. J. Soil. Biol. & Ecol,2002:20(1&2):47-50.
8. Phillip's JM, Hayman DS. Improved procedure for clearing roots and staining parasitic and vesicular arbuscular mycorrhizal fungi for rapid assessment of infection. Trans. Br. Mycol. Soc,1970:55:152-160.
9. Prabhu RR. Survey of soils of Mumbai and adjoining areas for native VAM, their multiplication and effect of their inoculation on local crops as bio fertilizers. A Ph.D. Thesis submitted to Mumbai University, 2002.