

Diversity of AMF: Performance of Coriander (*Coriandrum sativum* L.) along with Potato peels a general kitchen waste as manure under field conditions, Gujarat, INDIA

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Abstract - An Ayurvedic and a medicinally important plant Coriander was taken for the study. Seeds were sown under controlled conditions in triplicates where the soil was first sterilized and distilled water was used for the growth of plants. Another set was prepared without any treatment and was considered as control. Potato peels were used as manure in the triplicated pots. Diversity of AMF was studied after harvesting and the result showed a remarkable increase in the triplicate pots over controlled set.

Key Words: Coriander, Arbuscular Mycorrhizal Fungi (AMF), Manure, Diversity, Potato.

1. INTRODUCTION

AMF are a group of symbiotic fungi which allow the plants to uptake more nutrients and water from the rhizosphere.

The benefit afforded by the mycorrhizal symbiosis can be derived by the autotroph in terms of increased growth yield and by the soil in terms of flow of organic compounds to the soil, called as soil nutrients. (Bethlenfalvay, 1992). The mycorrhizal fungi proliferate both in the roots and in the soil. The soil borne extra radical hyphae, take up nutrients from the soil solution and transport them to the root. By this mechanism, there is an increase in the absorptive surface area of the plant. In nutrition poor and moisture deficient soils, this process leads to improved plant growth and reproduction. The mycorrhiza also gives the plant the ability to overcome environmental stress, in comparison to the non-mycorrhizal plants (Sylvia and Williams, 1992).

1.1 Coriander and Potato

Coriander belongs to the family Apiaceae. The plant is considered to have many important medicinal uses such as swellings, mouth ulcers, menstrual disorders, conjunctivitis, skin itching, eye care. Also, the juice of fresh leaves and the tea of powdered fruits of coriander are recommended for relief and anxiety and insomnia in Iranian traditional medicine. Similar uses of coriander, i.e. as a sedative or for relief of nervousness, have also been indicated in other folk medicines (Duke *et al*, 2002).

Potato (*Solanum tuberosum* L.) is ranked among one of the chief crops producing worldwide. As per the statistics of the Food and Agriculture Organization (FAO), the annual production of potato was over 300 million tons in 2016 (FAO 2016).

Potato peels having the nutritive properties of antioxidant, antibacterial, apoptotic, chemopreventive and anti-inflammatory within, the peel waste is used as fertilizer and being the raw material of biogas, which cause waste of abundant within (Liang *et al* 2014).

2. Methodology

The study was done at the Department of Botany, Gujarat University garden in the month of December 2020 and was studied for a comparative analysis. The triplicates were named as "PPA" as Potato peel A, "PPB" Potato peel, "PPC" Potato peel C and "C" for control. The study was done for 56 days and then harvested. The rhizospheric soil was then taken to the ecology laboratory of Botany Department for the study of diversity of AMF. Physical parameters of the soil

were also observed of all the samples viz. PPA, PPB, PPC and C. Spores of Arbuscular Mycorrhizal Fungi were identified by the key given by <http://invam.caf.wvu.edu>.

Table -1: Physical parameters of soil.

Physical parameters	C	PPA	PPB	PPC
pH	7.8	8.7	8.7	8.4
% Moisture content	6.5	10.8	10.8	10.9
% Water holding capacity	90.10	91.50	92.30	92.50

Table -2: Spores found in soil for both the samples.

Sr no.	Species name	C	PPA	PPB	PPC
1	<i>Glomus sp</i>	22	46	52	54
2	<i>Glomus mosseae</i>	50	58	55	60
3	<i>Glomus fasciculatum</i>	-	23	31	27
4	<i>Glomus formosanum</i>	24	26	29	30
5	<i>Glomus caledonium</i>	-	-	34	28
6	<i>Scutellospora sp</i>	42	54	59	56
7	<i>Gigaspora sp</i>	-	35	32	38

3. RESULTS

The result shows that the soil was alkaline. The % moisture content of the samples are respectively for C- 6.5, PPA-10.8, PPB-10.8 and PPC-10.9 %. Water holding capacity observed in C was 90.10, PPA- 91.50, PPB- 92.30 and PPC- 92.50 %. The number of spores and their diversity varied as compared to the control pot. A total of 138 spores from Control pot ,242 spore from PPA, 292 from PPB and 258 from PPC out of 100gm rhizospheric soil.

4. DISCUSSION

As observed all samples studied showed the presence of *Glomus sp.*, *Glomus mosseae*, *Glomus formosanum*, and *Scutellospora*. *Scutellospora*. Dipika et al, 2019 found a similar result with the natural diversity from the semi arid region at the Sample 1 site, spore density reached 408 spores/100 g of soil, whereas spore density reached 244 spores/100 g of soil at the Sample 2 site.

5. CONCLUSION

A total of seven species of Arbuscular Mycorrhizal Fungi were found from the study area. The genus *Glomus* was represented by 5 species: *Glomus mosseae* (Nicol and Gerd.) Gerd.and Trappe, *G. fasciculatum* Gerd. and Trappe emend. Walker and Koske, *G. formosanum*. *Glomus mosseae* were the most abundant and frequently observed AMF species in the experiment.

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