INTRODUCTION
The microbes have become an integral part of the entire biosphere. They play a key role in maintaining the biological equilibrium on earth. Different living components developed certain interrelationship such as symbiotic, mutualistic and pathogenic. It exists among plants, animals and microbes. These helped to maintain ecological balance of nature. Mycorrhizal research has become one of the most exciting areas of agricultural microbiology to bring rich benefits to plant life. Presently a general understanding has come to prevail among the plant scientists on the role of mycorrhiza in promoting growth of nursery plants.

Vesicular Arbuscular mycorrhizal fungi from order Glomales of the class zygomycetes are an important group of asexually reproducing soil borne fungi they form an obligate mutualistic symbiotic association with the root of most species of terrestrial higher plants (Trappe, 1987). The inoculation of plants with efficient VA – fungal endophytes is a promising perspective for the use of mycorrhizas (Jalali and Thareja, 1983, 1985). The VAM fungi act as biofertilizers, bioregulators and bioprotectors (Mulongoy et al., 1992).

The Government of India has to develop a productive requirement to meet the demand of increasing population. Vegetables form the most important component of a balanced diet as they supply proteins, vitamins and minerals. In India the population is predominantly vegetarian, vegetables enrich health of man they form most nutritive menu of man and
tone up his energy and vigour. In many parts of the world vegetable forms a
major part of the diet those who use vegetables less or those who are not in
a position to offer them suffer from mineral deficiency diseases. Several
vegetables are exported to foreign countries providing an opportunity of
earning foreign exchange.

The vegetables such as spinach, bottle gourd, bitter gourd, cucumber,
brinjal, tomato, okra can be grown twice or even thrice in the year. Modern
agriculture has given more emphasis to high yielding varieties and excess
fertilizers to achieve maximum yield per acre. Excess use of chemical
fertilizers may lead to water lodging condition of the soil and destroy useful
microbial population from the soil.

Considering the importance of VAM (Vesicular Arbuscular
Mycorrhizal) fungi and todays need of vegetables present study and
attempts are made to highlight applicability of VAM fungi in vegetable
crop improvements.

The Part - I of the research includes the VAM fungal infection and
root colonization in different vegetables such as Okra, chilli, tomato,
Brinjal, cucumber, Bottle gourd, Bitter gourd, Bean etc. were assessed at
nursery stage by pot culture experiment by using mix-population of VAM
fungi by making two sets of pots having control and VAM inoculated
plants. In the experiment maximum root colonization percentage was found
in Okra. So three different cultivars of Okra such as Parbhani kranti,
Arkanamika and Selection – 51 were selected for further experimentation.
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The roots for infection of VAM were assessed at field condition from some parts of Maharashtra State. The various species of VAM fungi from the different genera such as *Glomus*, *Acaulospora*, *Gigaspora* and *Scutellospora* were isolated from the rhizosphere soil of different vegetables such as Okra chilli, Tomato and Brinjal and identified with the help of synoptic keys. The mass multiplication of *Glomus fasciculatum* were tried on living root tissues of *Zea mays* with different treatments of systemic fungicide carbendazim.

The Part - II of research includes interactions of VAM fungi with soil microorganisms such as fungal pathogen *Fusarium oxysporum*, root knot or root gall causing nematode *Meloidogyne javanica* and pathogen of bacterial category. The response of three cultivars of Okra to the VAM fungi *Glomus fasciculatum* were observed and recorded the results of various growth parameters. The attempts were also made to infect some vegetable plants artificially with some VAM fungal species such as *Glomus fasciculatum* and *Gigaspora gigantea* and recorded the increase in the growth, biomass and yield due to VAM fungi. Also the enhancement in mineral nutrient uptake of phosphorus, nitrogen and calcium was recorded in cultivars of Okra. The increase of the biochemical contents chlorophyll pigment was also assayed due to the effect of VAM fungi. The specificity of *Glomus fasciculatum* and *Gigaspora gigantea* and three cultivars of Okra were assessed.
The selected VAM fungi found more or less specific in terms of biomass, yield, chlorophyll enhancement, phosphorus uptake, nitrogen uptake and calcium uptake like wise one or the other cultivars of Okra were also found more or less specific with VAM fungi.