Materials and Methods
MATERIALS AND METHODS

1. Medicinal plants chosen for the study: *Phyllanthus amarus, Solanum virium* and *Vetiver zizanioides*.

2. Microorganisms used: Vesicular arbuscular mycorrhizal fungi viz., *Glomus mosseae* and *Glomus fasciculatum*.

3. Phosphate solubilizer: *Trichoderma viride* and *Aspergillus awamori*.

I. Green House Experiments:

Green house experiments were carried out in pot containing sterilized soil with replications for each treatment. Treatments were as follows:

- **T1**: Control (No inoculation)
- **T2**: Inoculated with *Glomus mosseae*
- **T3**: Inoculated *Gm + Tv*
- **T4**: Inoculated *Gm + Aa*
- **T5**: Inoculated *Gf*
- **T6**: Inoculated *Gf + Tv*
- **T7**: Inoculated *Gf + Aa*
Maintenance of VAM Inoculum

G. mosseae and G. fasciculatum served on the mycorrhizal inoculum. The inoculum was maintained on Guinea grass (Pannicum maximum). The inoculum consisted of mycorrhizal guinea grass root fragments from stock ‘pot’ cultures. The VAM cultures were maintained in the Department of Botany, Bangalore University, Bangalore 560 056.

The Phosphate Solubilizing Fungi:

The phosphate solubilizing fungi viz., Aspergillus awamori and Trichoderma viride were used in this study. The ‘P’ solubilizers were maintained on Potato Dextrose Agar (Appendix 1). The test crops were treated with the cell suspension of A. awamori at a rate of \(2.4 \times 10^8\) cells g\(^{-1}\) and T. viride \(3.2 \times 10^8\) cells g\(^{-1}\) was used per plant.

Growth Parameters:

At harvest, plant height (cm), number of leaves fresh were recorded. The plant biomass was recorded after drying the samples in an oven at 60°C to attain a constant weight.
Mycorrhizal Per cent Infection:

Mycorrhizal infection is cortical root tissue was estimated by examining microscopically stained root segments (Appendix II) more than 50 root fragments per plant were observed and the percentage of root system converted into mycorrhiza (per cent mycorrhizal infection), taking into account both the length and width of the infected root cortex.

Chemical Analysis:

The treated soils were analysed for the following:

1. Phosphorus was estimated by the chloro stannous reduced molybdophoric acid blue method (Jackson, 1967) (Appendix III).


3. Potassium was determined by Flame photometric method (Jackson 1967) (Appendix V).

Plant Analysis:

The plant samples were analysed after subjecting them to a process of triacid digestion using nitric acid, sulphuric acid and 60% perchloric acid in the ratio of 10:1:4 in 100 ml conical flasks.

Acid digested samples were analysed for the following:

1. P
2. K
3. N
4. Zn, Fe, Mn

II. Field Experiments:

Field experiments with the test plants viz., *P. amarus*, *Solanum viarum* and *Vetiver zizanioides* were carried out in the medicinal plant garden at Department of Botany, Bangalore University with selected treatments. The treatments which resulted in higher biomass in pot experiments were selected for filed trial to explore their performance in the field. The experiments on all three plants were carried out separately following replicated randomized block design with four replications.
The treatment details are given below.

1. Experiment with *P. amarus* / *Vetiver* / *Solanum*.

- **T1**: Control (No inoculation)
- **T2**: Inoculated with *Glomus mosseae*
- **T3**: Inoculated *Gm + Tv*
- **T4**: Inoculated *Gm + Aa*
- **T5**: Inoculated *Gf*
- **T6**: Inoculated *Gf + Tv*
- **T7**: Inoculated *Gf + Aa*

At harvest the parameters were recorded as referred in pot experiments.