Introduction
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Indian soil is mostly impoverished in nitrogen. The role of legumes in enriching the fertility of soil is known through centuries. However, scientific demonstrations of the value of legumes in contributing to the nitrogen nutrition of plants were only done in the later half of the 19th Century (Fred et al., 1932). The experiments carried out by these scientists conclusively proved that legume root nodules are responsible for fixing atmospheric nitrogen and enriching the soil. The pulse crops capable of fixing atmospheric nitrogen symbiotically belong to the family, Fabaceae and they occupy the second position next to cereals as a source of human food. The seeds of these plants contain more proteins than any other plant. The pulses form an important food item for vegetarians. The high protein content is related to the presence of root nodules (Plant-Rhizobial Symbiosis) containing nitrogen fixing bacteria. Therefore, quite rightly one-seventh of the cultivated area in India is occupied by pulses (Pandey, 1980).

Microbes play many important roles in Agricultural Biotechnology; one among them is Biological Nitrogen Fixation (BNF). Man made N₂, P₂O₅ and K₂ containing fertilizers have come to stay in the present century for increasing the agricultural outputs and to meet the ever increasing demands of burgeoning human population. But the problem has been further accentuated by the limited availability of additional fertile farmland. Fertilizer nitrogen will be continually required for increasing grain production until a foreseeable future but efforts are afoot to mitigate the use of chemical nitrogenous fertilizers by supplementing with BNF.
There is a fear that there is going to be a protein shortage soon after the dawn of 2000 A.D. Therefore, to combat foot shortage most particularly by pulse crops, high yielding varieties have been evolved and supplied with high doses of nitrogenous fertilizers. The requirement of high doses of fertilizers is a costly affair and is mostly beyond the reach of marginal farmers. Moreover, too much and continued application of chemical fertilizers not only changes the physics and chemistry of the soil but also culminates in environmental pollution and salinity problems.

The concept of biofertilizers has gathered lot of momentum in recent times. This is mostly because the present fertilizer situation in India really warrants the use of low cost technologies. The term biofertilizer more appropriately called microbial inoculants may be defined as nutrient inputs of biological origin having manurial value for better plant growth and crop productivity. *Azospirillum* and *Azotobacter* are free living nitrogen fixers, whereas *Rhizobium* is a symbiotic nitrogen fixer that have been proved to be beneficial to cereals and pulses respectively in improving crop yield. These microbes also produce hormones and vitamins indirectly helping in plant growth.

In view of spiralling rise in the cost of synthetic fertilizers, dwindling of cultivable land year after year and increasing saline, and drought prone lands for cultivation, biofertilizer application to soils under different agroclimatic condition is being given a serious thought in recent times. The present study aims at screening drought-prone, saline, virgin and garden soils as well as (tannery effluent) polluted soil for efficient strains of *Rhizobia* for improvement of nodulation in legumes.
Infact, salinity is one of the most severe and insidious limiters of crop growth because it is intricately meshed with water and nutrient uptake into the plant. Plant growth is adversely affected when specific ion concentration exceeds the threshold level and thereby becoming toxic. Salts may also reduce plant growth by significantly reducing the water potential or interfering with ion uptake. Similarly, nodulation can also be affected by salinity. There appears to be a wide range of tolerance to salinity among the various rhizobial species; while some strains of rhizobia can survive soil water salinities greater than sea water, (46 ds/m), most strains of *R. japonicum* grow poorly in salinity (Bernard *et al.*, 1986). Salt effects of rhizobia appeared to be ion specific with Cl⁻, Na⁺, K⁺ and Mg²⁺ being more toxic than the corresponding sulphate ions (Elsheikh and Wood, 1989; Yadav and Vyas, 1973). Most rhizobial species are relatively unaffected by soil salinity levels less than the yield tolerance threshold reported for most leguminous crops. At soil salinities in excess of the threshold, the ability of rhizobia to survive and fix nitrogen may be severely reduced, (Balasubramanian and Sinha, 1976; Bernstein and Ogato, 1966; Upchruch and Elkan, 1977).

There is also a growing concern that the native microbial strains due to cultivation over and again have lost the potency of N₂ fixation and that they should be replaced by more virulent and highly competitive strains from different environments. Moreover, not much information is available on microbial isolates collected from such varied environments and employing them as bio-inoculants.
Therefore, in the present study, rhizobial strains, isolated from virgin soil, coastal saline soil, polluted soil and garden soil, through root nodule-trap method were employed as microbial inoculants in pulse crops such as *Vigna mungo*, *Vigna radiata* and *Vigna unguiculata* with the following aims.

1. **Characterisation of isolated rhizobial strains from different environments.**

2. **Evaluation of nodules and N\textsubscript{2} fixing ability of different rhizobial isolates.**

3. **Analysis of Biochemical constituents and assay of certain enzymes related to nitrogen metabolism in leaves and root nodules of inoculated and uninoculated (Control) plants.**

4. **Economic productivity of inoculated and uninoculated plants.**

5. **Salinity stress studies on the general performance of rhizobia in potted plants with special reference to nodulation.**