

Chapter 5

Conclusion

The research work carried out is summarized in the following points:

The project is divided into three phases. First phase of the project is to isolate the Rhizobial trait from the soil sample followed by the screening of the potent traits. Total 4 potent rhizobacterial isolates have been screened among 41 bacterial isolates from different sites of the Saurashtra region which are Rajkot Corn field (RC), Khijadiya Wheat field (KW), Khijadiya Sorghum field (KS), Khijadiya Chickpea field(KC), Veraval Garlic field (VG), Veraval Onion field(VO), Morbi Corn (MC). Soil samples were serially diluted and the suspension was spread on Nutrient Agar Medium followed by an incubation period of 24 hours at 37°C. Colony characteristics were noted down such as shape, size, margin, elevation, texture, pigmentation, and opacity. Microscopical identification is done on the basis of Gram's staining. Qualitative and quantitative characterization of growth promotion factors of the isolates was carried out such as HCN production, ammonia production, IAA production, and siderophore production. Among 41 isolates the 4 isolates KS2, KC8, KC9, and KC11 showed the highest growth parameter production and have been stated as PGPR traits.

In second phase the challenge was to inhibit the growth of plant pathogen by using Rhizobial trait as a biocontrol agent. These prospective can be achieved by checking the antagonistic activity between the plant pathogen and Rhizobial trait. Antagonistic activity is the action of an organism that suppresses or interfere with normal growth and activity of plant pathogen. This may be due to production of extracellular compounds or due to the colonization capability of organism on the plant surface which will provide defense against phytopathogen. The antagonistic activity was determined by employing dual culture method between 4 potent isolates and *Fusarium* species. KS2, KC8, KC9, and KC11 all of these isolates were survived against *Fusarium sp.* and have the capability to inhibit growth of pathogen. These traits show highest antagonism against pathogen. So, it can be further used in the consortia development and pot plant study of monocot and dicot plant.

Third phase involves consortia preparation. Consortia is the mixing of two or more bacterial group that act symbiotically in two prospects: helpful in plant growth promotion and involve in defense again pathogen. Utilization of microbial consortia with less complexity but equal

efficiency can lead to more controlled and optimized agricultural processes. This consortium can be used as biofertilizers as well as a biocontrol agent.