CHAPTER V
SUMMARY AND CONCLUSION

Groundnut (*Arachis hypogaea* L.) is an important food and oilseed crop in tropical and subtropical regions. It is the world’s fourth most important source of edible oil and the third most important source of vegetable protein. Groundnut is a rich source of energy, as it contains about 50 per cent edible oil and 30% percent of protein and hence, groundnut is valued both for edible oil and confectionery purpose. The groundnut oil is generally used in the preparations of vanaspati ghee, soaps, cosmetics and cold creams besides as cooking medium. Its cake is a valuable cattle feed and organic manure. It plays an important role in the dietary requirements of resources for poor woman and children. Groundnut also maintains soil fertility through biological nitrogen fixation in soil and thus plays a vital role in furthering sustainable agriculture.

It is prone to attack by several diseases, among these stem rot caused by *S. rolfsii* and collar rot caused by *A. niger* are the most important soil borne diseases causing considerable damage up to 40% in the field of saurashtra region.

*S. rolfsii* and *A. niger* are an important soil borne plant pathogens and is difficult to manage the disease by application of chemicals. Moreover, the chemical control measure is adopted for rapid and time bound suppression of disease. In the present study, investigation of different bacterial isolates of *Pseudomonas fluorescens* was contemplated.

A total of 50 isolates of *Pseudomonas fluorescent* were collected from rhizosphere soil of cotton, castor and groundnut from the farms of Junagadh Agricultural University and surrounding village of Junagadh taluka by serial dilution method on king’s B medium. All the isolates showed gram-negative reaction and were rod shaped. Out of 50 isolates, 23 isolates produced pigment and showed fluorescence under UV light.

All the six bacterial isolates showed more or less differences in their morphological characters, pigmentation and spreading nature but isolate GPh-29 colony colour is dirty green with round shape and non spreading in nature. The colony cells were rod shaped with high fluorescence rest than other isolates.
In physiological studies, *P. fluorescens* isolates were able to grow at 41°C temperature but fail to grow at 60°C temperature. All the isolates were able to grow in 2 to 10 per cent NaCl solution but failed to grow in 12 per cent concentrate solution. All the isolates grow in 6 to 8 pH range but they were failed to 4, 5 and 10 pH.

All the six fluorescent *Pseudomonas* isolates were screened for their antagonism against two common soil borne fungal plant pathogens ( *S. rolfsii* and *A. niger* ) under *in vitro* conditions using dual culture plate technique on Potato Dextrose Agar medium. In this study, *Pseudomonas fluorescens* (GPf-29) isolate showed highest potential as antagonist against *S. rolfsii* (73.10%) and *A. niger* (56.50%) fungal pathogen. The *Pseudomonas fluorescens* (GPf-29) isolate were of the choice as biocontrol agents as they showed the capacity to inhibit the growth of two fungal pathogens. It recorded lowest potential as antagonists for *S. rolfsii* (7.33%) in case of isolate SPF-9 and *A. niger* (0.02%) in case of isolate APf-24 and VPf-40.

In laboratory screening of compatibility of different Agro-chemicals with *pseudomonas fluorescens* isolates (GPf-29), all the chemicals inhibiting the growth of *P. fluorescens*. Among non systemic fungicides, thiram was found compatible with *Pseudomonas fluorescens* with 20.66 per cent growth inhibition followed by captan, which showed 33.32 per cent inhibition. Copper oxychloride was found not compatible with *Pseudomonas fluorescens*, showed highest growth per cent inhibition (91.60%). In systemic fungicides, azoxystrobin was found compatible with *Pseudomonas fluorescens* showed 24.98 per cent growth inhibition followed by carbendazim (26.22%). Tebuconazole was found not compatible with *Pseudomonas fluorescens* which showed highest growth per cent inhibition (76.27%). Among insecticides, imedacloprid was found least compatible with *Pseudomonas fluorescens* which showed 25.07 per cent growth inhibition followed by acetamiprid which showed (26.99%). Fipronil was found not compatible with *Pseudomonas fluorescens*, highest growth per cent inhibition (99.35%).

Six weedicides were also evaluated for their compatibility against *P. fluorescens in vitro*, during this investigation. *P. fluorescens* showed higher tolerance level against pendimethalin showed 48.09 per cent growth inhibition as compared to other weedicides. Oxydiargyl was found completely incompatible with *P. fluorescens* showed growth inhibition 99.40 per cent.