SUMMARY AND CONCLUSION

*Vaccinium leschenaultii* is an endemic medicinal plant found in the Sholas of the Nilgiri Hills, the Western Ghats, Southern India and produces a wide range of phytochemicals such as alkaloids, flavonoids, phenolic compounds, steroids, glycosides, carbohydrates, cardiac glycosides, tannins, anthraquinones, phenols, sugars, saponins, resins and the estimated amount of phytochemical constituents such as alkaloids, flavonoids, phenolic compounds and steroids which are confirmed by qualitative tests, HPLC and HPTLC profiles.

Berries of *Vaccinium* species have long been an important source of food and pharmaceutical ingredients and are considered to have high antioxidant potential. The antioxidant potential of *V. leschenaultii* was evaluated in different *in vitro* models like DPPH, radical scavenging activity, scavenging of superoxide radical and total antioxidant activity in concentration depended manner using different solvent systems like methanol, ethanol and chloroform. The ethanol extract exhibited DPPH radical scavenging activity than the other extracts and compared with standard ascorbic acid. Superoxide radical scavenging activity of *V. leschenaultii* extract has exhibited more scavenging of superoxide scavenging activity in ethanol. Generally, *V. leschenaultii* exhibited more antioxidant activity in all studied models. In the present study the antioxidant properties exhibited by *V. leschenaultii* are subordinate by the presence of phytochemical compounds. The increase of these antioxidant systems in the rats treated with extract of *V. leschenaultii* led to the suggestion that the extract possess antioxidant activity. This activity could be attributed to its phytoconstituents.

The anti-inflammatory activity of *V. leschenaultii* was assessed by Carrageenan induced paw oedema model in rats. The various extracts at two different dose levels (150 and 300 mg/kg b.wt.) were used and compared with a positive control drug, indomethacin (10 mg/kg b.wt.). Methanolic extract of *V. leschenaultii* with a concentration of 300mg/kg b.wt. showed maximum inhibition on carrageenan induced rat paw oedema. The effect was significantly (p<0.05) higher than the standard drug, indomethacin. Whereas, the chloroform and ethanol extracts at a concentration dose of 300mg/kg b.wt. Produce less percentage of inhibition.
The ethanolic extract of *V. leschenaultii* was tested for antidiabetic activity in streptozotocin induced diabetic rats. For this study, rats were classified into six groups viz., Group I rats given normal saline only, Group II STZ induced diabetic rats, Group III STZ induced rats treated with *V. leschenaultii* ethanolic extract at the dose of 100mg/kg b.wt. and Group IV STZ induced diabetic rats administered with ethanolic extract of *V. leschenaultii* administered with 200mg/kg b.wt. Group V STZ induced diabetic rats administered with ethanolic extract of *V. leschenaultii* administered with 400mg/kg b.wt. Group VI diabetic rats treated with glibenclamide at the dose of 600μg/kg b.wt. daily orally for 30days The body weight and organ weight of the diabetic rats were significantly decreased in the diabetic induced rats. The diabetic rat treated with ethanol extract of *V. leschenaultii* has resulted increase in the body.

The ethanolic extract of *V. leschenaultii* administered rats at the doses of 100, 200 and 400mg/kg b.wt. significantly decreased in the elevated glucose level. The level of insulin in diabetic rat was reduced and it was found to be significantly (p<0.01) increased after administration of the extracts at the doses of 100, 200 and 400mg/kg b.wt. It has marked decrease in urea and creatinine levels in the Group III, Group IV, Group V and as well as in Group VI. The extract of *V. leschenaultii* treated Group IV and V significantly (p<0.05) improved in protein, albumin and globulin levels in the serum of diabetic rats and restored to a normal levels. Meanwhile, these values after the treatment of diabetic rats with glibenclamide retrieved to normal levels.

The ethanolic extract of *V. leschenaultii* has exhibited a significant control of few marker enzymes like SGPT, SGOT and ALP levels which are evaluated in diabetic control. The extract at 200 mg/kg b.wt. of Group V significantly (p<0.05) prevented STZ induced rise in SGPT,SGOT and ALP levels. The effect of extract on serum lipid profiles of TC, TG, LDL-C, VLDL and PL were significantly increased in diabetic rats. However, HDL level was lowered in the diabetic control and restored after the administration of the extracts at the two doses (100,200 and 400mg/kg b.wt.) and also in Group VI. The activities of enzymatic antioxidants such as catalase, superoxide dismutase and glutathione peroxidase in the serum of diabetic Group II showed significant reduction when compared with the control Group I. The ethanolic extract of *V. leschenaultii* and glibenclamide treated rats reverted the enzymatic antioxidant activities to near normal levels.
Aqueous, petroleum ether, ethyl acetate and methanol extract of *V. leschenaultii* were studied for antimicrobial properties by using disc diffusion method. Among these, methanol extract has exhibited significant antimicrobial activity. In this study, seven bacterial and fungal strains were used. The maximum inhibition of the extract was observed in the bacterial strains such as *Salmonella paratyphi A*, *Bacillus subtilis* and *B. thuringiensis*. The inhibition zone of methanol extract was comparable to that of control tetracycline. Methanol extract has exhibited the maximum inhibitory activity against the *Aspergillus flavus* and *Penicillium notatum*. Whereas no activity was found in the aqueous extract. However, nystatin a positive control showed a highest activity against all studied organisms.

In conclusion, in the present study, *V. leschenaultii* ethanol extract showed antioxidant activity by inhibiting DPPH, scavenging superoxide as well as total antioxidant activity which may be due to presence of alkaloids, flavonoids, phenols, tannins (Phenolic compounds) steroids and triterpenoids found in the preliminary phytochemical screening as well as HPLC and HPTLC profiles. The ethanolic extract of *V. leschenaultii* has antihyperglycemic activity as it lowers serum glucose level in diabetic rat and significantly increases glucose tolerance. The crude methanol extract from *V. leschenaultii* showed good antimicrobial activity against bacterial and fungal strains, it may be due to the presence of phytochemicals. *V. leschenaultii* has exhibited a wide spectrum of activities, such as antioxidant, anti-inflammatory, anti-diabetic and antimicrobial activity. All these activities may be attributed to the presence of specific phytochemical constituents of this plant. The results are expected to provide a basis for the use of *V. leschenaultii* in the indigenous system medicine and as well as a source of pharmaceutical drugs. It is also suggested that the extract used as sources of natural antioxidants or neutracuticals for pharmacological applications. The data obtained from *V. leschenaultii* plant support the hypothesis that antioxidant capacity is more highly correlated to phytochemicals especially flavonoids and phenolic compounds. These data also could provide valuable information for development of antioxidant pharmaceutical products.