



## CHAPTER V

### SUMMARY

*Salvinia molesta*, a freshwater aquatic weed is abundantly available in nature but still not explored in detail for its medicinal properties. In the present study *Salvinia molesta* leaf extracts were assessed for their pharmacological and therapeutic values.

The collection and preparation of *Salvinia molesta* sample for experimental studies were performed by systematic and sophisticated methods ensuring the accurate preparation.

The pharmacognostic study of *Salvinia molesta* included preliminary phytochemical qualitative screening and quantitative analysis of major phytochemicals in five different solvents.

The antioxidant assays were performed to assess the potent antioxidant abilities of the plant extract which is directly responsible for the immuomodulatory role of a plant agent.

On analysing the five different solvents, the ethanolic solvent showed significant levels of results pertaining to the presence of major bioactive components both qualitatively and quantitatively.

The antioxidant property of the ethanolic extract was higher than other solvents comparatively and thus the highest antioxidant fraction was taken for further assays.

The ethanolic extract was assayed for antibacterial activity to identify its ability to act as an antibacterial agent since the same sample can be tested *in vivo* in animal models. When assayed with six major selected pathogens the ethanolic leaf extract of *Salvinia molesta* showed significant results for all the pathogens but showed highest inhibition against *A. hydrophila* and *P. aeruginosa*.

Based on the above results the ethanolic extract of *Salvinia molesta* was subjected to GCMS analysis to understand active compounds responsible for its pharmacological ability

Four important compounds were isolated by GCMS analysis and hence the crude fraction was confirmed for its potentiality as an therapeutic agent. Further the fraction was purified and compound analyses were performed by analytical methods such as NMR and FTIR.

The best antioxidant fraction was further utilised for series of animal studies. An experimental setup was made with six groups of animal batches infected with *A. hydrophila* and *P. aeruginosa* and treated with relevant concentrations of *Salvinia molesta*.

Group A (male) and Group B (female) are kept as saline treated control. Group C (male) and D (female) were kept as infected groups. Whereas, the treated groups are denoted as E- E<sub>3</sub> (male) and F-F<sub>3</sub> (female) in respective time interval of 24 hrs, 48 hrs, 72 hrs and 96 hrs, respectively.

Biochemical and immunomodulation parameters were observed in both male and female infected groups indicating the significance of *Salvinia molesta*.

The biochemical changes such as total carbohydrate, total protein and cholesterol was estimated in the hemolymph of both male and female freshwater crab, *Oziotelphusa senex senex*.

Carbohydrate, protein, lipid and microprotein reduced in both male and female infected groups (Groups C and D) and significantly increased in *Salvinia molesta* treated groups.

The immunological parameters such as THC, DHC and ProPO assays were performed to confirm the changes in hemolymph cells during infection and treatment with *Salvinia molesta* ethanolic extracts.

Total Hemocyte count, Differential Hemocyte Count and Prophenoxidase levels showed significant difference in infected and treated groups elucidating the immunomodulatory role of *Salvinia molesta* extract.

The Marker enzymes such as ACP and ALP were assayed and they increased in infected groups (Group C and D) and decreased in *Salvinia molesta* treated groups (Group E and F).

The antioxidant assays such as SOD, CAT, GPX, GSH, GST and GH was performed to assess the antioxidant ranges of hemolymph of both male and female *Ozietelphusa senex senex*.

The enzymatic assays (SOD, CAT, GPX, GST, and GR) and non enzymatic assays (GSH) showed significant increase in treated groups. Whereas, the free radical scavenging activity assays (LPO and NO) exhibited significant reduction in treated groups indicating the scavenging ability of *Salvinia molesta* ethanolic extract.

Thus it was concluded that the ethanolic leaf extract of *Salvinia molesta* possess significant therapeutic role and needed further research to develop it as an potent efficient drug source to treat aquaculture diseases and also to apply it on higher animal models for further productive analyses to understand its efficacy as a potent pharmaceutical and therapeutic agent.