CHAPTER 5

Conclusion

Preparation of botanical products from 17 plant species by using steam distillation and ethanol solvent extraction provided essential oils and ethanolic extracts, respectively, with varied yields, physical characteristics, and larvicidal activities against Aedes aegypti. Essential oil derived from Petroselinum crispum, the most effective plant, was proved to be promising larvicide and adulticide against the pyrethroid-susceptible (MCM-S) and resistant (PMD-R and UPK-R) strains of Ae. aegypti. Determination of mosquitocidal actions was carried out by observations on behavioral and morphological changes of the P. crispum oil-treated organisms under the light and scanning electron microscopes. The treated larvae and adults of MCM-S, PMD-R, and UPK- R showed similarly abnormal appearance such as excitation, restlessness, paralysis, and death. While physical changes in larvae pointed out that the toxic effect of P. crispum oil is mainly on the anal gills, causing larval death; the evidence of physical abnormality in the adults was unclear and needed further studies to verify the target and mechanism of adulticidal action. Biochemical study revealed the altered activity level of detoxifying enzymes, either the increase of GSTs, α - and β - carboxylesterases, and acid and alkaline phosphatases activities or decrease of AChE activity. Chemical analysis of P. crispum oil by using GC/MS technique demonstrated that 19 compounds, accounting for 98.25 % of the whole oil, were identified, with the main constituents being thymol, p-cymene, and γ -terpinene. In conclusion, P. crispum oil with remarkable mosquitocidal efficacy against the pyrethroid-susceptible and resistant Ae. aegypti is considered as an alternative to further development of larvicides and adulticides used in mosquito control programs.