

CHAPTER IV

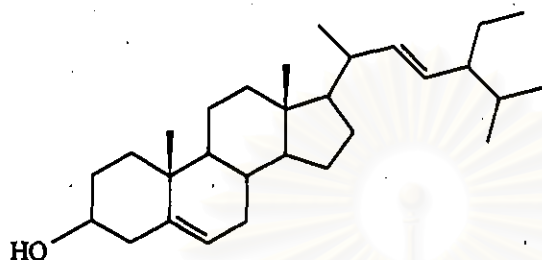
CONCLUSION

During the course of this research, eighteen crude extracts from *Eupatorium adenophorum* Spreng., *E. odoratum* Linn., *Ageratum conyzoides* Linn. and *Sphearanthus africanus* Linn. were preliminarily tested on plant growth inhibition, brine shrimp (*Artemia salina*) cytotoxicity, anticell line, antiplant pathogenic fungi, antioxidant and larvicidal (*Aedes aegypti*) activity. *E. adenophorum* gave the most attractive results for further investigation.

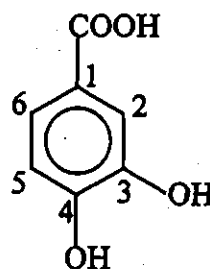
The extraction and fractionation by various organic solvents; hexane, dichloromethane, ethanol, ethyl acetate, and butanol of aerial part of *E. adenophorum* were conducted. Each crude extract was subjected to various bioactivities and the results showed that hexane crude extract exhibited the larvicidal activity (*A. aegypti*) at dose 125 ppm. Dichloromethane crude extract showed the best cytotoxicity against brine shrimp (*A. salina*) with LC₅₀ value of 10.43 at 24 h, Human Leukemia carcinoma (HL-60) cell line and antifungal activity. Ethanolic crude extract displayed cytotoxicity against Human Bladder carcinoma (BIU) cell line. Butanol crude extract behaved as plant growth inhibitor 100% at concentration 0.1 g and had cytotoxicity against brine shrimp with LC₅₀ value of 10.02 at 24 h. Ethanol, dichloromethane, ethyl acetate and butanol crude extracts also displayed as antioxidant agent. Furthermore, it was observed that at dose 0.1 g/mL dichloromethane, ethyl acetate and butanol crude extracts gave promising results on *Echinochloa colonum* Link., *Mimosa pigra* Linn. and *Oryza sativa* Linn. growth inhibition; 97.39%, 74.22% and 100% respectively.

By using bioassay as a guide to search for an active compound, the dichloromethane crude extract was separated and led to the isolation of a mixture of long chain alcohols (1), stigmasterol (2), a mixture of long chain carboxylic acids (3), a mixture of long chain esters (4). Protocatechuic acid (5) was obtained from ethyl acetate crude extract, and the butanol crude extract yielded steroid glycoside (6).

From the isolated compounds, protocatechuic acid possessed the highest results to inhibit rice seedling; 92.30% at dose level 1000 ppm, and steroid glycoside and a mixture of long chain carboxylic acid gave 43.96 and 21.71% rice seedling inhibition at dose 1000 ppm, respectively.



Compound 2



Compound 5

From brine shrimp and cell lines cytotoxicity test results, it can be concluded that brine shrimp cytotoxicity test results might be initial indicator of the according cell lines cytotoxicity test results.

Although *E. adenophorum* crude extracts can be used to inhibit growth of some weeds, *M. pigra* and *E. crusgalli* in empirical, it must be investigated further effects to other plants and amount used in general real field.

The promising results of crude extracts of weeds in Compositae family on several bioassay, especially plant growth inhibition, and anticell lines activity were firstly reported. Other chemical constituents are also interesting, so it would be conducted to further investigation. The methodology of bioassay guides to investigate active compounds may be the remarkable way to search for substances which would be applied to use not only in agricultural but also in medicinal purposes.