

CHAPTER IV

CONCLUSION

This research has been focused on searching for biological active compounds from *Coscinium fenestratum* (Gaertn.) Colebr., a medicinal plant in the Menispermaceae. The preliminary results revealed that the ethanolic extract of the stems of *C. fenestratum* displayed the significant anticancer activity against cell lines (KB, BC and NCI), antifungal *Candida albicans*, antimalarial and antituberculosis activity. In addition, it also exhibited low toxicity against brine shrimp *Artemia salina* Linn. and *Vero cells*.

Ten substances were isolated from the stems using chromatographic techniques. On the basis of physical properties and various spectroscopic method including 2D-NMR techniques, their structures were established as: a mixture of steroids (stigmastan-3,5,22-triene, stigmastan-3,5-diene, β -sitosterol, campesterol and stigmasterol), berberine, jatrorrhizine, a long chain ester, a mixture of oleanolic acid, 8-oxotetrahydrothalifendine, 8-oxoberberine and a mixture of steroidal glycoside (stigmasteryl-3-O- β -D-glucopyranoside and β -sitosteryl-3-O- β -D-glucopyranoside) from precipitate fraction, while calonysterone and ajugasterone D from dichloromethane and ethyl acetate extracts. This is the first report for a mixture of oleanolic acid, a mixture of steroidal glycoside, calonysterone and ajugasterone D in this species. All the structures of isolated substance are illustrated in Fig. 4.1.

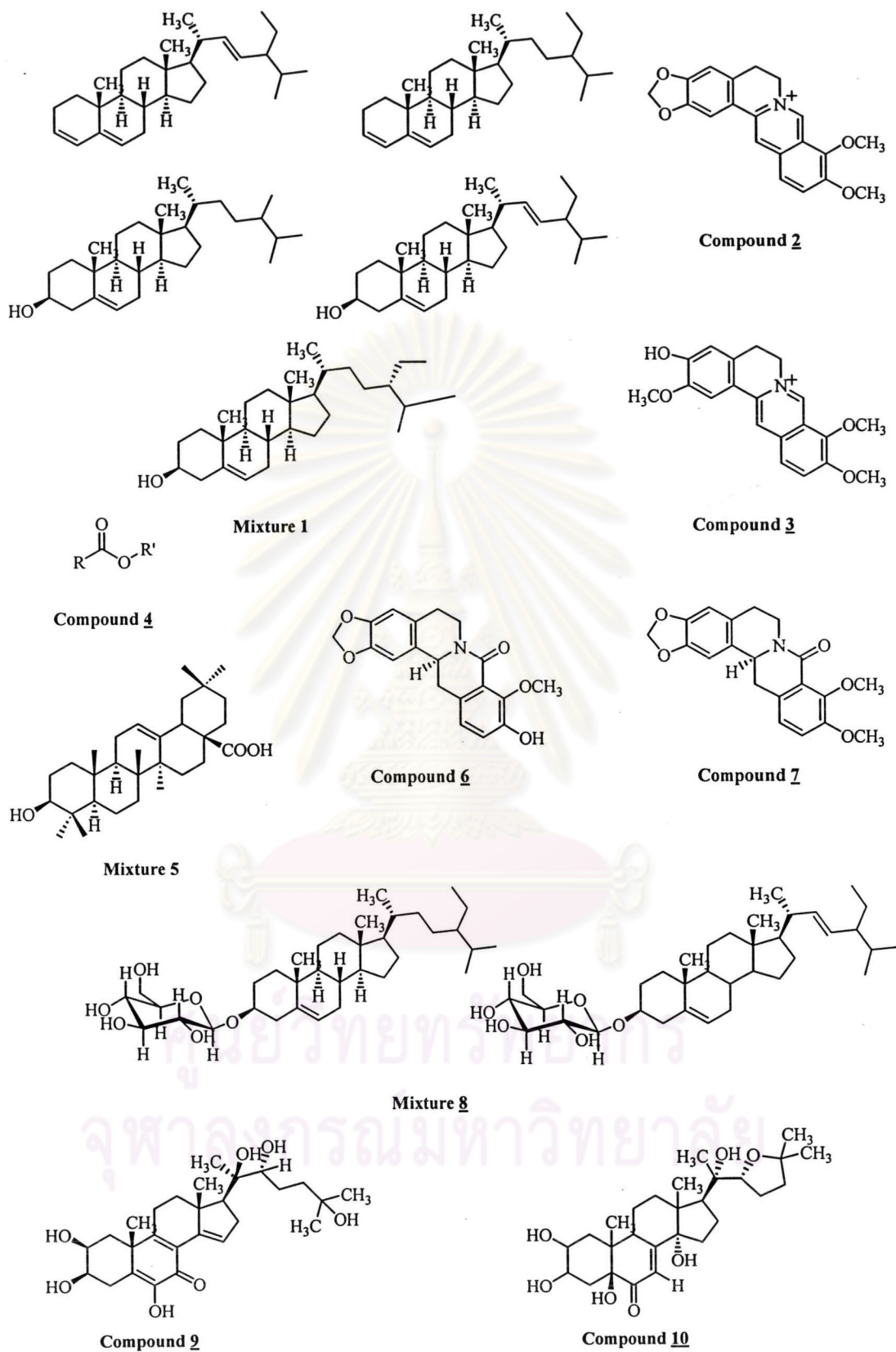


Fig. 4.1 Isolated substances from the stems of *C. fenestratum* (Gaertn.) Colebr.

The results from preliminary bioassay revealed that berberine, a major constituent presented impressive anticancer activity against KB, BC-1 and NCI-H187 with IC_{50} values of 0.48, 0.95 and 0.30 $\mu\text{g/mL}$, respectively. This compound showed cytotoxicity activity with IC_{50} value of more than 50 $\mu\text{g/mL}$ and antimalarial activity with EC_{50} value of 0.11 $\mu\text{g/mL}$ and displayed moderately antifungal activity against *Candida albicans* with IC_{50} value 13.0 $\mu\text{g/mL}$. In addition, berberine displayed plant growth regulating activity against the root growth of *Mimosa pigra* Linn and *E. crus-galli* Beauv. with the percentage of inhibitive value of 100 and 69 % at 1000 $\mu\text{g/mL}$, respectively. Moreover, this compound exhibited antifungal activity against pathogenic fungi; *Phytophthora sp.*, *Alternaria sp.* and *Fusarium oxysarum* with IC_{50} values of 79, 83 and 1170 $\mu\text{g/mL}$, respectively.

From the results of biological activity it might be concluded that berberine (Compound 2) was the most active compound of this extract and was responsible for almost activity studied.

The SAR study of berberine and its salts displayed that some salts of berberine showed more potent activity than original compound for some biological assays. For instance, all berberine salts exhibited more strong activity against cell lines than a parent compound. On the other hand, some salts displayed lower activity against anti-tuberculosis and antifungal than original compound.

Proposal for Future Work

By means of preliminary bioassay, it was indicated that this plants displayed intriguing activities. The results of cytotoxicity test implied that this plant had low toxicity, while the results for other biological assays suggested that this plant had potential. Therefore, further studies on those mentioned bioassays should be conducted in more details.

Compound 2, a major compound of this plant, was obtained in a great quantity and displayed various activities. For instance, anticell lines, antimalarial, and *etc.* Therefore, this compound should be studied including the structure activity relationship against many biological assays in order to be obtained the structure that will have a good potent biological activity.

Moreover, the chemical constituents and biological activity study of parts of *C. fenestratum* (Gaertn.) Colebr. should be investigated to complete the chemotaxonomy aspects.

Finally, the results from this research supported a promising concept of the fully utilization and biological active compound searching from ideal and potential natural resources of folk medicinal plants.



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