

CHAPTER V

CONCLUSION

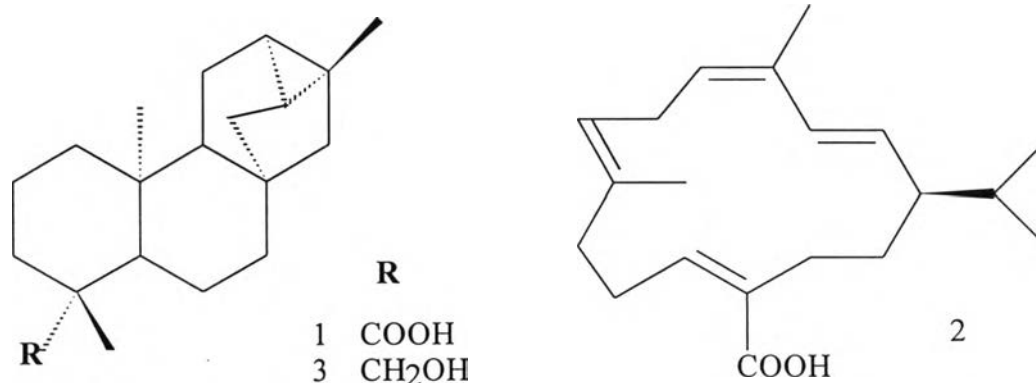
In this research, the powdered, sun-dried stem barks (6 Kg) of *Croton robustus* Kurz. was extracted with hexane, chloroform and methanol, respectively and obtained three different crude extracts; hexane crude extracted (60 g, 1.00 % wt. by wt. of the dried stem bark), chloroform crude extracted (80g, 1.33 % wt. by wt. of the dried stem bark) and methanol crude extracted (8g, 0.13 % wt. by wt. of the dried stem bark). The chemical constituents of stem barks of *C. robustus* were investigated.

The hexane crude extracted of *C. robustus* stem bark was separated from silica gel column chromatography using hexane-chloroform gradient system, to obtain two trachylobane diterpenoids; trachyloban-19-oic acid (1) and trachyloban-19-ol (3) and one cembrane diterpenoid; poilaneic acid (2). The chloroform crude extracted of *C. robustus* gave similar compounds as in hexane crude extract. Methylation of trachyloban-19-oic acid (1) with diazomethane changed it into methyl ester which was reduced to alcohol identical to trachyloban-19-ol (3). From X-ray diffraction data of methyl ester of trachyloban-19 oic acid (1a) recrystallized from methanol indicated carbomethoxyl group which was an axial orientation carbomethoxyl group. The carbomethoxyl group (19 ester) at C-4 was the same side of molecule as methyl group (C-20). The relative configuration at C-19 methyl ester and H-20 was also indicated by orientation of cyclopropane system. Therefore substituent of trachyloban diterpene series (trachyloban-19-oic acid, trachyloban-19-ol) at C-4 substituent is axial orientation. This represents the first recorded of a trachylobane diterpene from Genus *Croton*.

All isolated substances from hexane crude extracted (60g) of the stem barks of *C. robustus* were shown in Table 19.

Table 19 Isolated substances from the stem barks of *C. robustus*.

| Compound | Name of compound | Weight (mg) | % wt. by wt. of the dried stem bark |
|----------|-------------------------|-------------|-------------------------------------|
| 1 | Trachyloban-19-oic acid | 300 | 0.0050 |
| 2 | Poilaneic acid | 60 | 0.0010 |
| 3 | Trachyloban-19-ol | 40 | 0.0006 |

**Figure 16** The stereochemistry of compound 1-3

The isolated compounds and their derivatives were tested by cytotoxic activity against 6 tumor cell lines. Compound 3 and 1a showed weak cytotoxic activity against only Kato-3 (gastric) and SW 620 (colon) cancer. The former exhibited an IC_{50} value of 9.2 and 9.6 $\mu\text{g/ml}$, and the latter exhibited 8.3 and 9.1 $\mu\text{g/ml}$, respectively. Other compounds were inactive at concentration lower than 10 $\mu\text{g/ml}$.

Proposal for the future work

The discovery of compounds belonging to *C. robustus* firstly reported in this thesis would be interesting for future investigation. Maybe other parts of *C. robustus* will have an interesting chemical constituents and biological activities. Therefore, it will be useful to investigate chemical constituents in the stem barks of

Croton robustus Kurz., anti-cancer, anti platelet aggregation. These will fulfill the completion study of chemical constituents of genus *Croton*.