

CHAPTER I

INTRODUCTION

Medicinal plants are one of the natural products evolved from man's desperate attempt to conquer of physical suffering, coupled with overwhelming desire for an eternal life. There is a worldwide trend towards the use of drugs of natural origin since they are believed to possess less harmful side effects than synthetic drugs. There has also been an effort to develop medicinal plants in order to make them be safe and effective drugs such as the development of an antipeptic ulcer drug from plao-noi (*Croton sublyratus* Kurz.). From the Thai medicinal plant literature, plao-yai (*Croton oblongifolius* Roxb.) was often used with plao-noi.

Plao Yai belongs to the Euphorbiaceae family[1]. The scientific name of Plao Yai is *Croton oblongifolius* Roxb. In this family, there are 800 genera and 5000 species. Plao Yai was found in evergreen forests, deciduous forests and groves of brushwood. In Thailand, it is commonly called as Plao Yai (central), Pao Luang (Northern).

According to indigenous medicinal herb pharmacopoeia[2] all parts of Plao Yai are useful. For instance barks are used to inhibit chronic enlargements of livers and inhibit remittant fever, leaves can remedy liver complaints, scabies and kill parasite, fruits and seeds are purgative and are used on treatment of snake-bite, flowers are used to kill parasite, albuminum used to assist digestion and in remedy of leprosy, heartwood is remedy of faint, pus and is used as laxative and roots are remedy in dysentery, chronic rheumatism, purgative and are poisonous in larger doses.

General Characterization of the Plants in the Genus *Croton*[3].

The genus *Croton* comprises 700 species of trees or shrubs. Leaves are usually alternate with 2-glandular stipule at the base. Their flowers are solitary or clustered in the rachis of a terminal raceme and bracts are small. Male flowers contain 5-calyx, 5-petals. There are many stamens inserted on a hairy receptacle. In female flowers, sepals are usually more ovate than the male, petals are smaller than the sepals or missing and disk annular of 4-6 glands are opposite the sepals. There are three ovary with solitary ovule in each cell. Seeds are smooth, albumen copious and broad cotyledons.

General Characterization of *Croton oblongifolius* Roxb.[4].

Croton oblongifolius Roxb. is a medium sized tree. Its calyx and ovary are clothed with minute orbicular silvery scales. Leaves are 5.6-12.0 by 13.0-24.0 cm in size. The shape of leaf blade is oblong-lanceolate. Flowers are pale yellowish green and solitary in the axils of minute bracts on long erect racemes. The male flowers locate in the upper part of the raceme and the females in the lower part. Male flowers are slender and have the length of pedicels of 4.0 mm. Calyx is more than 6.0 mm long and segments are ovate, obtuse and more than 2.5 mm long. Petals are 3.0 mm long, elliptic-lanceolate and woolly. The twelve stamens are inflexed in bud and the length of filaments are 3.0 mm. In female flowers, the pedicels are short and stout. Its sepals are more acute than in the male with densely ciliated margins. Diameter of fruit is less than 1.3 cm, slightly 3-lobed and clothed with small orbicular scales. In each fruit, the number of seeds are eight which are 6.0 mm long rounded and quite smooth on the back.



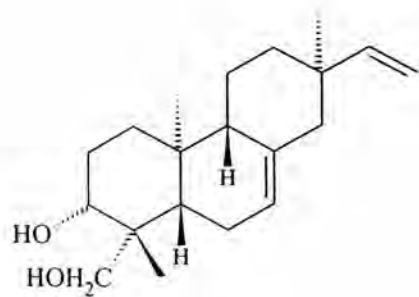
Figure 1 *Croton oblongifolius* Roxb.

The picture of stem-barks, leaf, flower and fruit of *Croton oblongifolius* Roxb. are shown in Fig. 1[5].

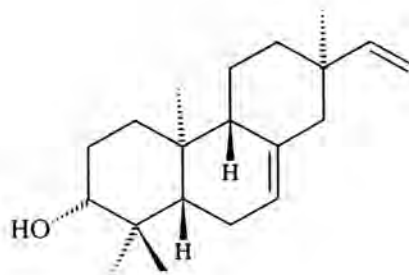
Previous Studies in diterpenoid compounds of *Croton oblongifolius* Roxb.

From the literature surveys, *Croton oblongifolius* Roxb. have been widely studied and many diterpenoid compounds have been isolated and characterized in table below.

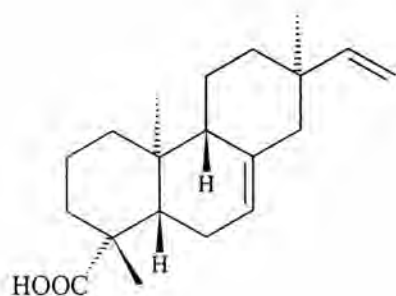
Plant parts	Crude Extract	Substances	References
Stem barks	Hexane	Oblongifoliol	[6]
		19-Deoxyoblongifoliol	[7]
		Oblongifolic acid	[8]
		<i>ent</i> -Isopimara-7,15-diene	[9]
		<i>ent</i> -Isopimara-7,15-diene-19-aldehyde	[9]
		11-Dehydro(-)-hardwickiic acid	[10]
		(-)-Hardwickiic acid	[10]
		Crotoembraneic acid	[11]
		neo-Crotoembraneic acid	[12]



Oblongifoliol



19- Deoxyoblongifoliol



Oblongifolic acid

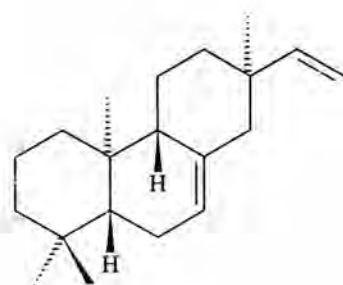
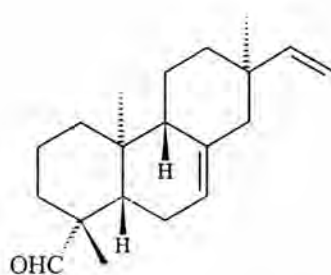
*ent*-Isopimara-7,15-diene*ent*-Isopimara-7,15-diene-19-aldehyde

Figure 2 The structure of the diterpenoid compounds from *Croton oblongifolius* Roxb.

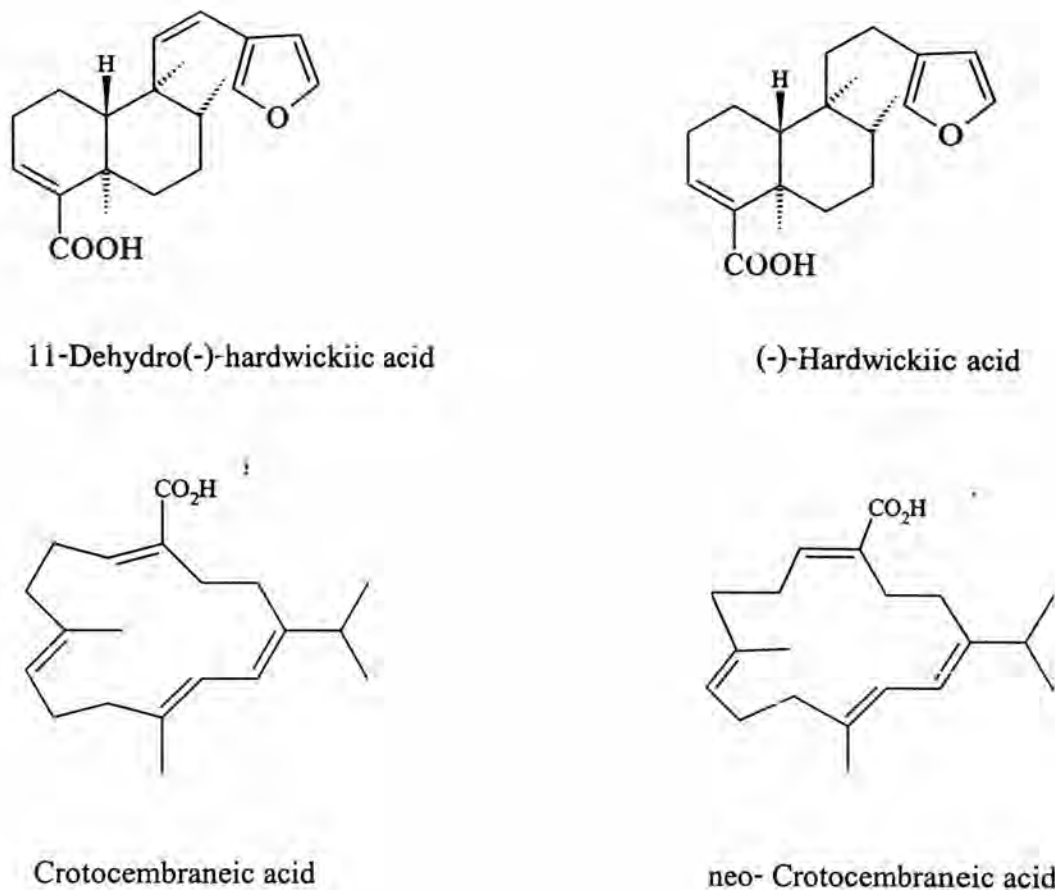


Figure 2 The structure of the diterpenoid compounds from *Croton oblongifolius* Roxb. (continued).

From the information, the stem barks of *Croton oblongifolius* Roxb. can be used as drug and the previous studies in chemical constituents of the stem barks of *Croton oblongifolius* Roxb. have not yet been found any biologically active compounds. Therefore it was decided to re-investigate diterpenoid compounds of the stem barks of *Croton oblongifolius* Roxb.

Thus, the objective of this research will be summarized as follows :

1. To extract and isolate the diterpenoid compounds of the stem barks of *Croton oblongifolius* Roxb.
2. To identify the structural formula of the isolated substances.