

CHAPTER I



INTRODUCTION

Medicinal plants are rich natural resources. They are cheap, effective and less harmful side-effects than synthetic drugs¹. Thai people know well about herbal medicine for a long time. Documents recording the use of herbal medicine were found in plum leaves, kloi paper and marble tablets. In the past, medicinal plants were used in simple forms as alcoholic extract of dried whole plants (“Yaa Dong Lao”) or as ingredients in foods and drinks. Nowadays, there are trends towards isolating and identifying the active ingredient in these plants in order to understand the principle behind the therapeutic effects and in search for more potent drugs. Accordingly, medicinal plants are widely studied by modern techniques in a more scientific way.

1.1 General characterization of the plants in Genus *Croton*

Croton oblongifolius Roxb. (Plao Yai)² belongs to the Euphorbiaceae family. It is a local medicinal plant, which has therapeutic properties. In Thailand, most researchers have concentrated on chemical constituents of a variety of *Croton*, especially *Croton oblongifolius* Roxb. (Plao Yai), *Croton sublyratus* Kurz. (Plao Noi), *Croton cascarilloide* Raeusch. (Plao Ngoen) and *Croton hutchisonianus* Hoss. (Plao Pae). Recently, an effective anti-peptic ulcer drug has been extracted from Plao Noi (*Croton sublyratus* Kurz.) (Fig.1). The active compound was plaunotol. It is likely that Plao Yai, which is a closely related plant, will contain similar chemicals which are effective drugs. Thus Plao Yai is another interesting medicinal plant.

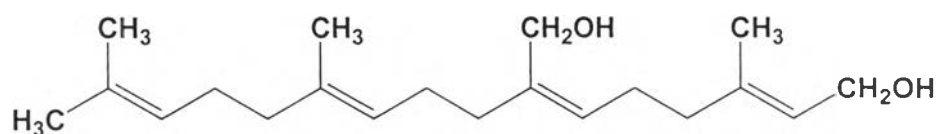


Figure 1. The structure of Plaunotol from *Croton sublyratus* Kurz.

According to the study of *Croton oblongifolius* Roxb.(Plao Yai) from different areas, it was found that the chemical constituents are different as well as biological activities.³⁻⁹ *Croton robustus* Kurz. (Plao Lueat) can be used as an antianemic agent. Plaunotol from Plao Noi is an effective anti-peptic ulcer drug available commercially. The barks and leaves of Plao Noi can be used as an antiulceric agent.¹⁰⁻¹² Moreover, plenty of interesting chemical constituents are found in Plao Ngoen¹³ and Plao Pae.¹⁴ Plao Ngoen can also be used as an antifebrile.

Croton oblongifolius Roxb. is a very interesting Thai medicinal plant because it is believed that all parts of the plant can be used as drugs. The leaves can be used as a tonic, the flowers are used as a teniacide, the fruits are used to treat dysmenorrhea, the seeds are used as a purgative, the barks are used to treat dyspepsia, and the roots are used to treat dysentery.¹⁵ Moreover, this plant is widely distributed throughout Thailand.

All parts of *Croton oblongifolius* Roxb. have been used as herbal medicine and sometimes use in conjunction with *C. sublyratus*. From previous researches,¹⁶⁻²² the compounds which are isolated from Plao Yai have not yet had pronounced effective activities as plaunotol from *Croton sublyratus* Kurz. The structure of compounds that have been isolated so far, were not so similar to plaunotol. It is believed that the effective compound in *Croton oblongifolius* Roxb. should have a structure similar to plaunotol. In 1972 Aiyar and Seshadi²³ was found compounds in the woods of *Croton oblongifolius* Roxb. similar to those found in stem-bark and root-bark although in lower quantities. From previous studies, the difference of diterpenoid compound were found in *Croton oblongifolius* Roxb. and some compound have been shown to inhibit the growth of cancer cells.²⁴ Therefore, *Croton oblongifolius* Roxb. contains a variety of diterpenoid compounds. To continue the investigation of *Croton oblongifolius* Roxb. plants from Amphoe Phurua, Loei province were studied. The NMR-screening of crude hexane extract indicated that this crude extract contained a variety of diterpenoids which have been found previously. Therefore, it is of interest to study to chemical components as well as the biological activities of *Croton oblongifolius* Roxb., which was collected from from Amphoe Phurua, Loei province.

1.2 The objectives of this research

1. To extract, isolate and purify the organic constituents of the stem barks of *Croton oblongifolius* Roxb. From Amphoe Phurua, Loei province.
2. To identify the structure of the isolated compounds which were obtained from the stem barks of *Croton oblongifolius* Roxb.