

CHAPTER I

INTRODUCTION

Croton roxburghii N.P. Balakr. (*C. oblongifolius* Roxb.) is a medium-sized tree belonging to the Spurge family (Euphorbiaceae), a large family with over 7,000 currently recognized species (Clapham, Tutin, and Warburg, 1962). According to เต็ม สมิตินันท์ (2544), this plant is known in Thailand as Plao yai (เปล้าใหญ่) (Central), Plao luang (เปล้าหลวง) (Northern), Khwa-wuu (ควะวู) (Karen-Kanchanaburi), Seng-khe-khang (เซ่งเค่คัง), Sa-kaa-waa (สะกาว่า), Saa-kuu-wa (สา์ควะ) (Karen- Mae Hong Son), Poh (เปาะ) (Kamphaeng Phet) or Haa-yoeng (ห่าแย่ง) (Shan-Mae Hong Son).

For a long time, *Croton roxburghii* N.P. Balakr. has been regarded as being among the most efficacious of medicinal plants in Asia. It is often used in combination with *Croton stellatopilosus* Ohba. to treat gastric ulcer and gastric cancer. The seeds and fruits are known to have a purgative effect. The flowers are believed to be parasiticide. The bark is used in India as a remedy for chronic liver enlargement and remittent fever, whereas in Thailand it is used to cure biliary diseases and to reduce phlegm. The Santals use the bark and root as a purgative and as an alterative in dysentery. The root bark is given in small doses as a purge; a larger quantity is poisonous. The sapwood is used for dyspepsia, while the heartwood for flatulence. The leaves are used externally in Cambodia

for liver complaints and scabies (Blatter, Caius and Mhaskar, 1975; สายสนม กิตติขจร, 2526).

1. Botanical aspects of *Croton roxburghii* N.P. Balakr.

A medium-sized tree; young shoots, branchlets, inflorescence, calyx, and ovary clothed with minute orbicular silvery scales. Leaves 12.5-25 by 5.7-11.5 cm., crowded towards the ends of the branchlets, oblong-lanceolate, subacute, glabrous when fully grown, more or less crenate or serrate, penninerved, base usually acute with no apparent glands above the petioles; main nerves numerous, slender; petioles 2-3.2 cm. long. Flowers pale yellowish green, solitary or fascicled in the axils of minute bracts on long erect, often fascicled, racemes, the males in the upper part of the raceme, the females in the lower part. Pedicels of male flowers variable in length, reaching 4 mm. long, slender. Calyx more than 6 mm. across when flattened out, divided about $\frac{3}{4}$ down; segments more than 2.5 mm. long, ovate, obtuse. Petals 3 mm. long, elliptic-lanceolate, obtuse, woolly. Stamens 12, inflexed in bud; filaments 3 mm. long, the lower half hairy. Female flowers: Pedicels short, stout. Sepals more acute than in the male, with densely ciliate margins. Petals 2 mm. long, obovate, with densely woolly margins. Styles 3, nearly 4 mm. long, each again subdivided into 2 long slender curled branches 3 mm. long. Capsules less than 1.3 cm. in diameter, subglobose, a little depressed, slightly 3-lobed, clothed with small orbicular scales. Seeds 8 by 6 mm., ellipsoid, rounded and quite smooth on the back. (Blatter, Caius and Mhaskar, 1975; ถีนาน ผู้พัฒนาพงศ์, 2530; วงศ์สถิต น้่วกุล และ กณษะ, 2538).



Figure 1: *Croton roxburghii* N.P. Balakr.

2. The objectives of this research

Previous phytochemical studies of *Croton roxburghii* N.P. Balakr. carried out by Aiyar and Seshadri (1970, 1971a, 1971b, 1972a, 1972b) have revealed the presence of many diterpene compounds in the stem bark of the plant. It was later discovered that this same plant collected in various parts of Thailand contains different chemical constituents, which is possibly due to geographic variations (Roengsumran *et al.*, 1998, 1999a, 1999b, 2001). Further phytochemical studies of this plant have thereafter been conducted, with a view to complete the chemotaxonomic knowledge of this species. In this study, the plant specimen collected from Loei province has been examined. The TLC pattern and NMR spectral data showed the plant to have constituents unlike those collected elsewhere. The plant was therefore considered to be very interesting, and chosen for investigation

The main objectives of this investigation are as follow:

1. to isolate and purify chemical compounds from the stem bark of *Croton roxburghii* N.P. Balakr. collected from Nahaew district, Loei province, Thailand.
2. to determine the chemical structure of each isolated compound.
3. to screen the cytotoxic activity of the crude extracts and isolated compounds.