



CHAPTER I

INTRODUCTION

Coscinium fenestratum Colebr. is a large liana with yellow wood and sap, known in Thai as "khamin khrua" (ขมิ้นเครือ). The genus *Coscinium* belongs to the tribe *Coscinieae* of the family *Menispermaceae*. This genus comprises of 2 species, both of them are stout woody climber growing in the tropical rain forest regions of Asia. *Coscinium* species are characterized by the axillary flowers, extra-axillary or cauliflorous in racemiform or peduncled subumbellate aggregate, 20-50 cm in length. The floret is monochlamydeous with 6-9 tepals, unisexual. The leaves are subpeltate or ovate, large, hard-coriaceous, palmately nerved, reticulate, densely hairy beneath. The fruits are drupelets 1-3, globose-obovoid pubescent. According to the *Index Kewensis*, the genus *Coscinium* are recognized as follows:

- 1 *Coscinium blumeanum* Miers.
- 2 *Coscinium fenestratum* (Gaertn.) Colebr.
 - = *C. wallichianum* Miers.
 - = *C. usitatum* Pierre.

Coscinium fenestratum Colebr. is a large liana with yellow wood and sap. Young twigs are hairy, their first leaves obviously peltate, the next ones ovate,

with obtuse-truncate-subcordate, not or hardly peltate base with concave margins, mostly shortly acuminate, hard coriaceous, shining above, 12.5-30 cm by 10-25 cm. The petiole is 5-15 cm, with curved thickened base densely hairy, the inflorescences are axillary or cauliflorous with 6-12 florets. (Backer, 1963)

Male flowers : tepals 9, imbricate in 3 whorls, externally sericeous ; stamens 6, the outer 3 free with 1-locular introrse anthers, the inner 3 with connate filaments and with 2-locular extrorse anthers. Female flowers : tepals as in male ; staminodes 6 ; carpels 3 ; densely pilose, style filiform recurved. Drupes subglobose tomentellous, endocarp covered with anastomosing fibrous ridges, condyle deeply intrusive, thickly clavate and containing 2 ducts, each linking the seed-cavity with a pore on the basal surface of the endocarp ; seed subglobose, peltate, enveloping the condyle, endosperm surrounding the divaricate, folded and divided cotyledons. (Forman, 1978)

In Thailand, traditional medicine named "khamin khrua" refers to the woody climber with yellow wood. In the South of Thailand "khamin khrua" is *Fibraurea tinctoria* Lour. While in the South Eastern region is that of *Arcangelisia flava* Merr. and *Coscinium fenestratum* Colebr. Furthermore, people in the northern part of Thailand claim that "khamin khrua" is obtained from *Anamirta cocculus* Wight & Arn. Although there are many different species under the name "khamin khrua" but they have been used in the same therapeutic purpose in folkloric medicine.

Various parts of "khamin khrueta" have been used in pharmaceutical utilization for a wide variety of diseases such as fever, colic, muscle pain, stomachic pain and as the antibiotic, antidiarrhoea and antifungal. In folkloric medicine people favor to use stems and roots of "khamin khrueta" than leaves because of the riches of their alkaloid contents.

In India *Coscinium fenestratum* Colebr. ; known as "Dharhaidi", is used to prepare a yellow dye. It is also widely used as a medicine : aqueous or alcoholic extracts are used as a bitter tonic, a paste of pounded roots and stems is used to dress bruises and contusions. Darvi, and ayurvedic drug, used against ulcers and affections of the eye. Chopra describes the therapeutic use of berberine, the main alkaloid of the four species of "khamin khrueta" and some other menispermaceous and berberidaceous medicinal plants. According to Darvi, berberine containing plants are used in traditional medicine against affections of the digestive tract (e.g. gastric ulcers) and against infections (oriental sore, conjunctivitis). He also mentions the use of local injections of berberine sulphate to cure dermal leishmaniasis.

Dr. Phan-quoc-dinh of the Faculty of Pharmacy, Hanoi, Vietnam, provided tablets named "Codan B" to cure dysentery. It contained the crude alcoholic extract of *Coscinium fenestrarum* Colebr. But by TLC only one alkaloid, berberine, could be detected. (Siwon, 1981)

There are many reports about the antimicrobial activity of protoberberine alkaloids. The berberine class alkaloids are reported to have a moderate, slow and selective antimicrobial activity with a low toxicity. So far no allergic reactions or local side effects are known to occur after therapeutical application of protoberberine type alkaloids. In Martindale's extra pharmacopoeia 39th ed, 1989, berberine is mentioned in the treatment of cholera, amoebiasis and diarrhoea.

Phytochemical work on the alkaloids of *Coscinium fenestratum* Colebr. arose primarily from various pharmaceutical investigation of the alkaloids of *Coscinium fenestratum* Colebr. of the Philippines which berberine, palmatine and jatrorrhizine have been isolated and characterized (Garcia et al, 1970). Then quite an amount of work was carried out with *Coscinium fenestratum* Colebr. from South Kalimantan, Indonesia. Six alkaloids have been isolated, five of them are protoberberine alkaloids, and the other is aporphine alkaloids (Siwon et al, 1978). In 1988, a new minor alkaloid was furnished from *Coscinium fenestratum* Colebr. by Malhortra and co-research workers (Malhortra et al, 1988). There is no report about chemical investigation of *Coscinium fenestratum* Colebr. in Thailand. Now, the total number of alkaloids so far isolated and characterized from *Coscinium fenestratum* Colebr. exceeds 9 isoquinoline alkaloids, eight of them are protoberberine and the other is aporphine.

It is notable that most of the previous work have been done by using plant materials in different geographic from Thailand. The variation between geographical variants and even chemical races may occur in the species of *Coscinium fenestratum* Colebr. This thesis describes the investigations of alkaloids from the stems of *Coscinium fenestratum* Colebr. from Chanthaburi, Thailand. It is undertaken in the hope that it might reveal an interesting variation of the pattern of alkaloids from those previously reported.