

CHAPTER I



INTRODUCTION

Uncaria salaccensis Bakh. f. nom provis found in Khao-Yai National Park, Nakorn-Rachasima, Thailand; having a climbing habit, globose flowering heads and peduncles converted into recurved hooks as outstanding characters. The genus belongs to the family Rubiaceae.

Species of the genus *Uncaria* are widely distributed in tropical and subtropical regions, particularly in the Far-East (Saxton, 1965 a), Africa, America, Australia and Asia; the greatest concentration of species being in Malaysia (Burkill, 1870). The first species of *Uncaria* was described from a South American sample as *Ouroparia guianensis* by Aublet in 1775. Schreber in 1789 named this species *Uncaria guianensis* and the generic name *Uncaria* is now conserved over *Ouroparia*. The first Malaysian species of *Uncaria* was not described until 1808 when Hunter presented a paper to the Linnaean Society on the production of the tannin gambir in the Malay Peninsula and described the plants used in the process, placing them in the genus *Nauclea*. Roxburgh later correctly placed these species in the genus *Uncaria* and described further species (Phillipson, Hemingway and Ridsdale, 1978). There are as many as 120 specific names of *Uncaria* in the Index Kewensis due to the difficulties in distinguishing them (Ridsdale, 1978).

This genus is widely distributed throughout Thailand with its concentration in the southern part of the country. Twenty-five specific names reported to be found are listed below as originally recorded (Craib, 1932; Thailand, Royal Forest Department, 1948; Backer and Bakhuizen van den Brink Jr., 1965; Ridsdale, 1978) :-

1. *Uncaria acida* (Hunt.) Roxb.
2. *U. attenuata* Korth.
Localities : Chumporn, Pattani, Surat-Thani.
3. *U. borneensis* Havil.
4. *U. canescens* Korth.
Localities : Bhuket, Surat-Thani.
5. *U. cordata* (Lour.) Merr.
6. *U. dasyoneura* Korth.
7. *U. elliptica* R. Br. ex G. Don
Locality : Northern.
8. *U. ferrea* (Bl.) DC.
Localities : Nakorn-Sritamrat, Patalung, Ranong, Trang.
Local Name : Ngop-"โงบ" (Ranong).
9. *U. ferrea* DC. var. *tomentosa* King
10. *U. glaucescens* Craib
Locality : Ranong.
Local Name : Yan-Chieo-Chu-"ย่านเจียวจู"
11. *U. homomalla* Miq.
Localities : Chantaburi, Lampang, Prachinburi, Prachuap,
Ubonrachathani.

Local Names : Ngop-"โงบ", E-ngop-"ฮโงบ" (Prachuap);
 Khao-khwai-mae-lup-"เขาควายแม่ทูล" (Lampang).

12. *U. jasminiflora* Hook. f.
13. *U. laevigata* Wall. ex G. Don
 Localities : Chiangmai, Chantaburi.
14. *U. lanosa* Wall.
 Localities : Bhuket, Surat-Thani.
15. *U. longiflora* (Poir.) Merr.
 Localities : Surat-Thani, Pattani.
 Local Name : Kieo-cho-"เกี้ยวไซ้" (Pattani).
16. *U. macrophylla* Wall.
 Locality : Chiangmai.
 Local Names : Khwai-mae-lup-"ควายแม่ทูล"; Khao-khwai-mae-lup-"เขาควายแม่ทูล".
17. *U. parviflora* Ridl.
 Locality : Yala.
 Local Name : Kieo-cho-"เกี้ยวไซ้".
18. *U. pedicellata* King et Gamble, and *U. pedicellata* Roxb.
 Localities : Surat-Thani, Pattani.
 Local Names : Ai-hom-"อายโหม" (Surat-Thani), Lep-rok-"เล็บรอก" (Pattani).
19. *U. pilosa* Roxb.
 Locality : Udon-Thani.
20. *U. pteropoda* Miq.
21. *U. quadrangularis* Geddes
 Locality : Chumporn.

Local Name : Ngop-"โงบ".

22. *U. salaccensis* Bakh. f. nom provis

Locality : Nakorn-Rachasima.

Local Name : Khrua-see-liam-"เครือสีเหลี่ยม".

23. *U. scandens* (Smith) Hutch.

Localities : Mae Hong Sorn, Udon-Thani.

24. *U. sclerophylla* King et Gamble, and *U. sclerophylla* (Hunt.)

Roxb.

Localities : Bhuket, Chantaburi, Naratiwat, Pattani,

Ranong, Surat-Thani.

Local Name : Ka-phum-"กาพุม" (Ranong).

25. *U. trinervis* Havil.

Locality : Surat-Thani.

Recently a world wide revision of this genus has been undertaken by Ridsdale and 34 species are now recognised. Many of those species recorded as being found in Thailand are now recognised by other specific names. There are, however, still some differences among his published papers in placing one species as synonym for other or in regarding many specimens as being one species (Phillipson, Hemingway and Ridsdale, 1978; Ridsdale, 1978). In particular, *Uncaria salaccensis* Bakh. f. nom provis has been regarded as a synonym of *U. attenuata* Korth. (Ridsdale, 1978) but in his more recent paper, it is placed under *U. elliptica* R. Br. ex G. Don (Phillipson, Hemingway and Ridsdale, 1978).

Several species of *Uncaria* are employed for making astringent

preparations for application to wounds, for gargles and for treating intestinal complaints and other ills. The leaves of *U. acida* (Hunt.) Roxb. are used to relieve pain by rubbing on the body (Burkill, 1870). *U. africana* G. Don has reportedly been used for the treatment of stomach pains and syphilis. Specifically, the bark has been used for the common cold, and the leaves for chest complaints. *U. bernaysii* F. V. Muell. is mentioned as a possible alternative source of gambir. *U. callophylla* Korth. has the same uses as, but has been proved to be inferior to, *U. gambir* (Hunt.) Roxb. for gambir production. The young stem of *U. cordata* (Lour.) Merr. yield a black dye. *U. elliptica* R. Br. ex G. Don has been used as a source of gambir in Sri Lanka (Phillipson, Hemingway and Ridsdale, 1978). The Malays use a decoction of the leaves of *U. ferrea* DC. for cleaning wounds and ulcers, and an infusion of the uninjured roots as a drink for inflammation of the intestine. *U. gambir* (Hunt.) Roxb. is well known as the source of the astringent substance gambir (Burkill, 1870). Leaves and twigs are sources of black gambir used in tanning, producing a soft porous leather, also used in dyeing, printing and for clearing beer. The leaves are also used locally by the Malays for chewing betel (Willis, 1960). Decoction of the leaves of *U. guianensis* (Aubl.) Gmel. is used for dysentery (Uphof, 1968). Young shoots of *U. horsfieldiana* Miq. have been reported as a source of a dye. More specifically, the Malays are said to use a decoction of the leaves and also an infusion of the uninjured roots of this plant as they use those of *U. ferrea* DC. *Uncaria lanosa* Wall. has been used as an alterative source of gambir. The leaves of *U. longiflora* (Poir.) Merr. are said

to be used against rheumatism and are rubbed into the body for the relief of pain. Extracts of *U. perrottetii* (A. Rich) Merr. containing alkaloids had slight antitumour activity when tested by The Medical Research Center, National Institute of Science and Technology, Manila, Philippines. *U. rhynchophylla* Miq. has been used in the treatment of children's disease, including infantile fevers and nervous diseases and also in adults for dizziness and for vision and bilious disorders. Antispasmodic activity and sedative action is attributed to the hooked thorns. The bark of *U. sclerophylla* (Hunt.) Roxb. is used for dyeing thread. Poultices prepared from the roots have been reported to be used in skin ulcers. The bark of *U. sessilifructus* Roxb. is said to be chewed as a substitute for betel. *U. sinensis* (Oliv.) Havil. has been stated to be replaced by *U. rhynchophylla* Miq. for the treatment of children's diseases in Japan. The hooks are reportedly an important drug in traditional Chinese medicine for the treatment of fevers and various nervous disorders. In an analysis of prescriptions, the suggestion has been made that the hooks may be employed for their sedative action (Phillipson, Hemingway and Ridsdale, 1978). The very bitter reddish brown bark of *U. tonkinensis* Havil. is used as masticatory instead of areca nuts and are considered febrifuge (Uphof, 1968).

In Thailand, leaves of some species of *Uncaria* are chewed and used as a substitute for the leaves of *Mitragyna speciosa* Korth., known as "Kratom" (Ponglux, Tantivatana and Pummangura, 1977), which are chewed as a narcotic (Henry, 1949).

Pharmacological study indicates that, when administered intraarterially, indole compounds exert transmission blocking effect in the rat superior cervical ganglion. Hirsutine shows a relatively strong inhibitory effect while isorhynchophylline is less potent (Harada, Ozaki and Sato, 1974). Generally, ganglionic blocking agents, in large doses, show an effect like those of the neuromuscular transmission blocking agents and vice versa. However, effect of indole compounds on neuromuscular transmission are not consistent. Some have augmentation action while others show inhibitory effect. The latter effect is shown to be towards the contractions elicited by either direct stimulation of the muscle or of the sciatic nerve, or towards both. Hirsutine has depressive effect on both directly stimulated muscle contraction and neuromuscular transmission while isorhynchophylline is again shown to be little effective (Harada and Ozaki, 1976). Mitrephylline is a hypotensive and also exerts a general depressant effect on smooth muscle. Rhynchophylline exhibits a significant antipyretic action and a hypotensive property (Saxton, 1965 a). This alkaloid has also been shown to paralyse parasympathetic nerve endings (Henry, 1949).

Uncaria is a large genus and several species, but not all, have been subjected to chemical investigations and shown to contain alkaloids. *Uncaria salaccensis* Bakh. f. nom provis from Thailand is one of those species which have not been studied for their chemical constituents. The present work deals with the alkaloid content of the leaves of this particular species.