

CHAPTER I



INTRODUCTION

Uncaria attenuata Korth. (*U. gambir* Wall.; *U. sclerophylla* DC.) is a large woody climber, known in Thai as "Ngõb (โงบ)". The genus belongs to the sub-tribe Mitragynineae, tribe Cinchoneae, sub-family Cinchonoideae of the family Rubiaceae (Ridsdale, 1978).

There are 120 specific names of *Uncaria* in the Index Kewensis (Phillipson and Hemingway, 1975a; Phillipson et al., 1978). In 1897 Hayiland divided the species of the genus *Uncaria* known to him into six informal sections (Fig. 1, pp. 2-5) (Phillipson et al., 1978). In 1972 Ridsdale has reinvestigated the genus and divided it into seven groups 34 species using the presence or absence of interfloral bracteoles and whether the flowers are pedicellate or sessile as main characters in classification. Other important characters used are the shape and relative length of the calyx and calyx lobes and the form of stipules - whether entire, shallowly or deeply bifid. These are also summarised in Fig. 1 (Phillipson et al., 1978).

The genus *Uncaria* is widely distributed in tropical regions, its stronghold being South East Asia, from Malaysia to Solomon Islands, though it is also found in other parts of Asia, in Africa, South America and Australia (Ridsdale, 1978; Phillipson et al., 1978).

Fig. 1 Relationships within *Uncaria* arranged as a dendrogram

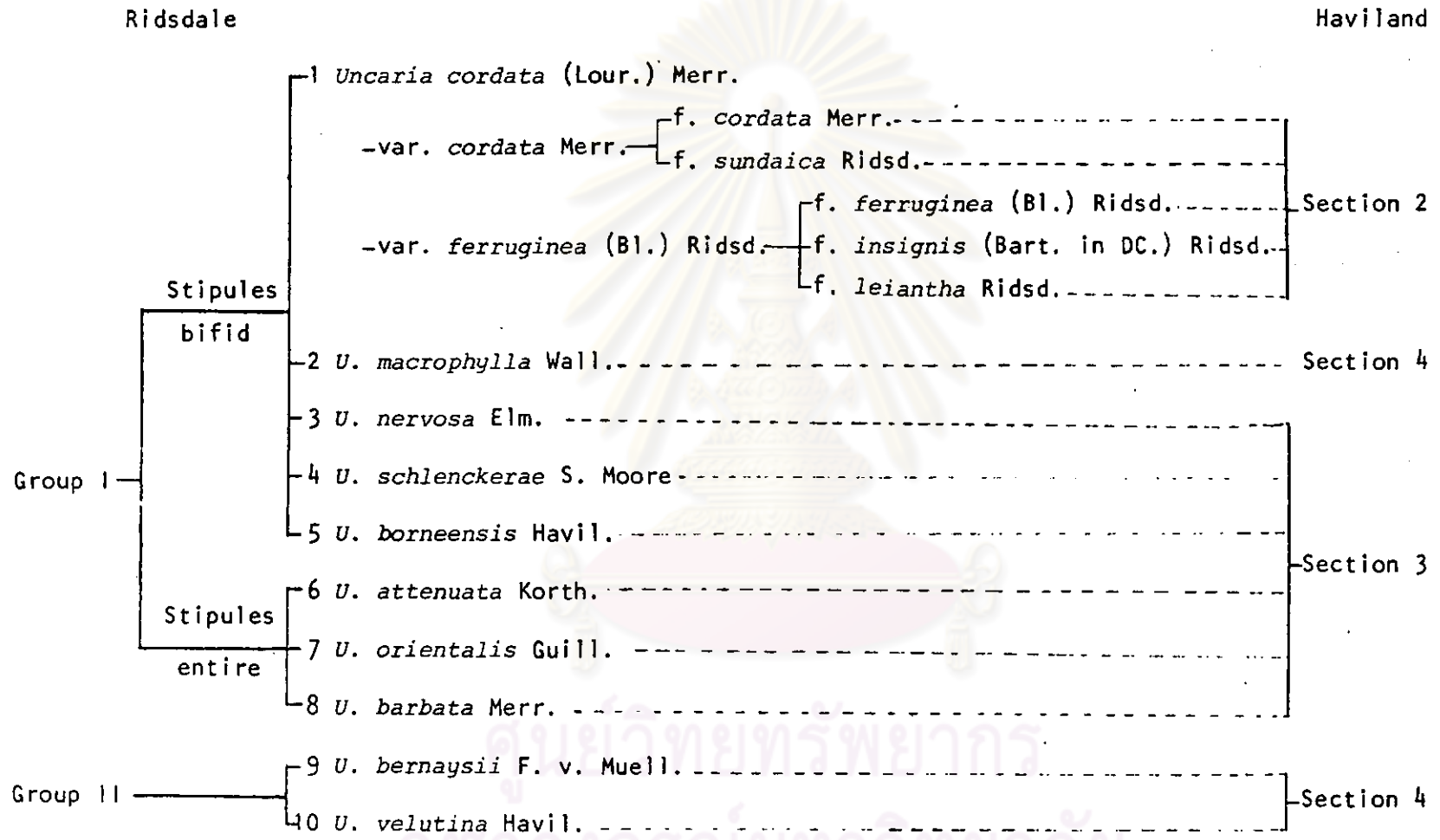


Fig. 1 (continued)

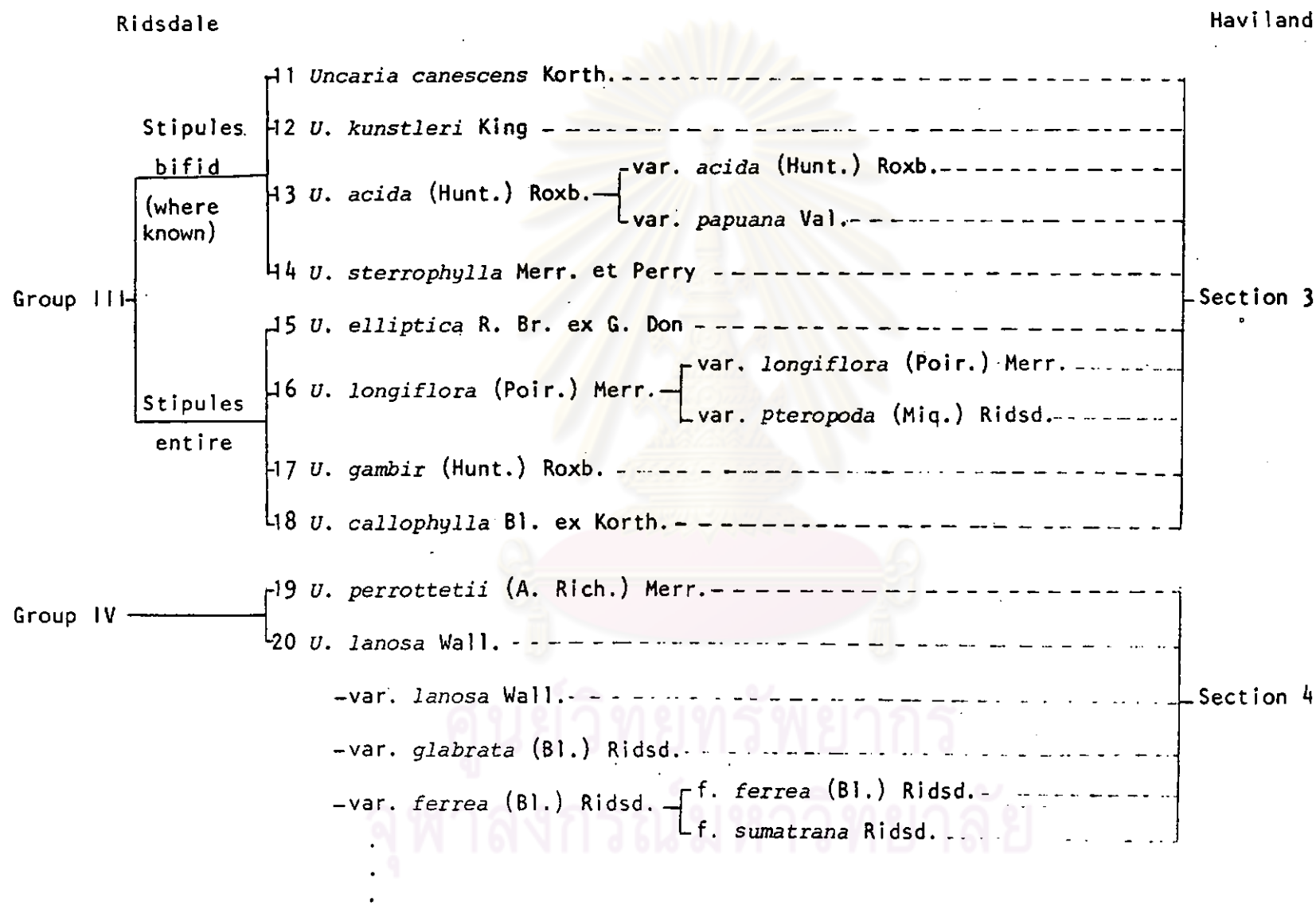
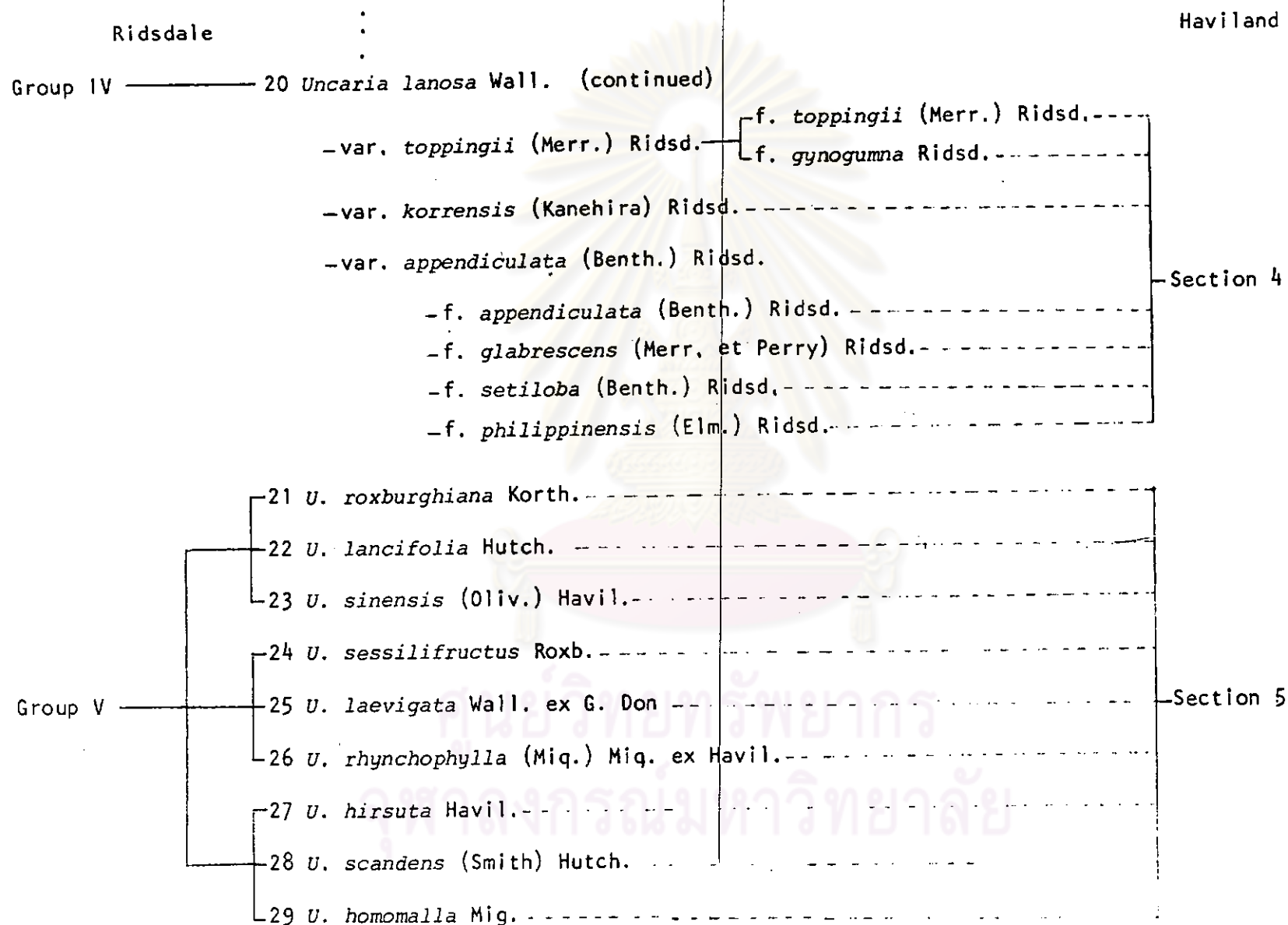


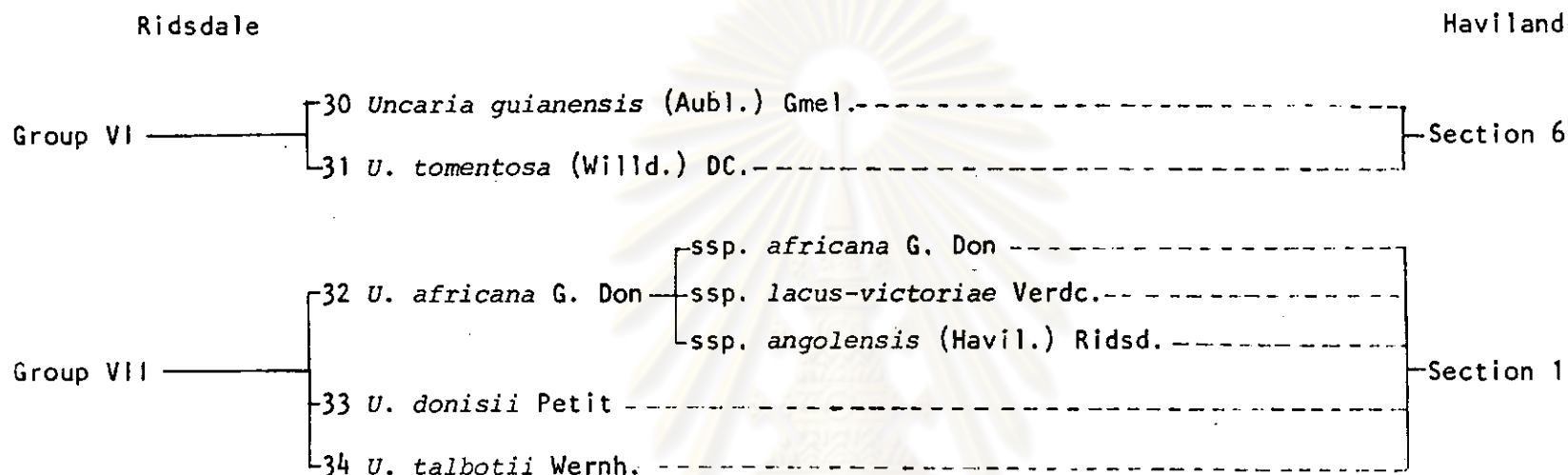
Fig. 1 (continued)



Section 4

Section 5

Fig. 1 (continued)



- Interfloral bracteoles : - absent in Groups I, II, III.
 - either absent or present in Group IV.
 - present in Groups V, VI, VII.

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In Thailand most of *Uncaria* species are concentrated in the southern part. Twenty-five specific names reported to be found are listed below as originally recorded :

1. *U. acida* (Hunt.) Roxb.
2. *U. attenuata* Korth.
3. *U. borneensis* Havil.
4. *U. canescens* Korth.
5. *U. cordata* (Lour.) Merr.
6. *U. dasyoneura* Korth.
7. *U. elliptica* R. Br. ex G. Don
8. *U. ferrea* DC.
9. *U. ferrea* DC. var. *tomentosa* King
10. *U. glaucescens* Craib
11. *U. homomalla* Miq.
12. *U. jasminiflora* Hook. f.
13. *U. laevigata* Wall. ex G. Don
14. *U. lanosa* Wall.
15. *U. longiflora* (Poir.) Merr.
16. *U. macrophylla* Wall.
17. *U. parviflora* Ridl.
18. *U. pedicellata* King et Gamble
and *U. pedicellata* Roxb.
19. *U. pteropoda* Miq.
20. *U. pilosa* Roxb.
21. *U. quadrangularis* Geddes
22. *U. salaccensis* Bakh. f. nom provis

23. *Uncaria scandens* (Smith) Hutch.

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

25. *U. trinervis* Havil.

(Craib, 1932; Royal Forest Department, 1948; Backer and Bakhuizen van den Brink Jr., 1965; Phillipson et al., 1978).

When the climbing stem of large species of *Uncaria* is cut, potable water may be obtained (Burkill, 1870).

U. gambir (Hunt.) Roxb. was of economic importance as a source of gambir. Rumpf reports that the natives of the Moluccas add *U. gambir* leaves to the betel-quid as a source of the astringent substance gambir or gambier. He also states that people of Java and Bali plant this shrub near their houses, both to enjoy the fragrance of its flowers and for its leaves which they masticate. In the Malayan Medicinal Book gambir is prescribed in a lotion for application to burns and in a paste for scurf. In Borneo it is used externally for sciatica and lumbago. In Meldrum's list of Johore medicines, it is said that an infusion of fresh leaves and young shoots of *U. gambir* is given for diarrhoea and dysentery and also used as a gargle for sore throats (Burkill, 1870). Other medicinal uses of gambir are for the treatment of cholera, of intermittent fever when quinine is not effective and for stomatitis (Phillipson et al., 1978).

The dried leaves of *U. guianensis* (Aubl.) Gmel. have been used for healing wounds, and the infusion for treatment of dysentery (Phillipson et al., 1978).

The infusion of *Uncaria tonkinensis* Havil. have been used as a depurative and the red-brown, bitter bark is used as a masticatory instead of areca nuts (Phillipson et al., 1978).

The Chinese pharmacists use the grapples of *U. sinensis* (Oliv.) Havil. in treating children for fever and various nervous disorders (Burkill, 1870). It has been stated that, in Japan, this plant has been replaced by *U. rhynchophylla* Miq. (Phillipson et al., 1978). In the prescription of Chut Lee Powders of Ma Pak Leung Co., Ltd., Hong Kong, there is 12 % of *U. rhynchophylla*. This prescription is used in the treatment of stomachache, colic, fever and nervous disorder in children. A recent report on Chinese herbal medicine states that a decoction of the dried stems and twigs is mixed with decoctions of other herbs for the treatment of "liver fire", fever, headache, dizziness, flushed face and eyes. In another preparation, the decoction is mixed with decoctions of other different herbs and is used against pediatric fever, colds and convulsion. Antispasmodic and sedative actions are attributed to the hooked thorns (Phillipson et al., 1978).

U. africana G. Don has reportedly been used for the treatment of stomach pains and syphilis. Specifically the bark has been used for common cold and the leaves for chest complaints (Phillipson et al., 1978).

The Malays use a decoction of either *U. ferrea* (Bl.) DC. or *U. horsfieldiana* Miq. leaves for cleaning wounds and ulcers, and an infusion of the uninjured roots as a drink for inflammation of the intestine (Burkill, 1870; Phillipson et al., 1978).

Alvins states that *Uncaria acida* (Hunt.) Roxb., *U. ovalifolia* Roxb., *U. longiflora* (Poir.) Merr. and *U. pteropoda* Miq. leaves are used to relieve pain by rubbing them onto the body. Ridley states that the leaves of the latter two are also used for rheumatism. Rumpf states that in the Moluccas the leaf juice of these two species are used for thrush and when mixed with iron-rust, for frambesioma (Burkill, 1870).

In Sumatra *U. sclerophylla* (Hunt.) Roxb. bark is used for dyeing thread (Burkill, 1870), and the roots have been reported to be used as a poultice for skin ulcers (Phillipson et al., 1978).

The Medicinal Research Center, National Institute of Science and Technology, Manila, Philippines, reported that the extracts, containing alkaloids, of *U. perrottetii* (A. Rich.) Merr. had slight antitumour activity (Phillipson et al., 1978).

In Thailand, the leaves of some species of *Uncaria* are chewed by the natives as a stimulant as they chewed *Mitragyna speciosa* Korth. leaves under the local name 'Kratom' (Saxton, 1965a). In 1897 Ridley reported the leaves and bark of *M. speciosa* as a cure for opium habit and this was also quoted by Hooper (Shellard, 1974; Shellard et al., 1978b). In Malaya, the leaves of *M. speciosa* are chewed or a preparation is made from them in different ways or they are smoked as one smokes opium (Burkill, 1870).

Reports on the alkaloid content of different samples of *Uncaria attenuata* Korth, from Sumatra, Java, Sabah and Philippines are presented (Phillipson and Hemingway, 1975b; Phillipson et al., 1978), but not of those from Thailand. This thesis deals with the alkaloids

present in the leaves of this particular species as further contribution to our knowledge about the alkaloids present in the same species, but obtaining from different localities.



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