CHAPTER I

INTRODUCTION

Several flowering plants in the family Rubiaceae have been used as dyestuffs as well as medicines for a long time. A lot of research works have been done in both pharmacological and phytochemical studies of Rubiaceous plants, including genus *Morinda*.

The plants in the genus *Morinda* belong to the tribe Morindeae, subfamily Coffeoideae, of the family Rubiaceae (Rendle, 1952). *Morinda* species are cosmopolitan in distribution, they can be found from Tropical Asia to Polynesia. (Perry, 1980)

Backer and Bakhuizen Van Den Brink Jr (Backer and Bakhuizen Van Den Brink Jr, 1965) describe genus *Morinda* as follows :

Flowers in peduncled capituliform, irregularly globose or ovoid inflorescences, 4-6-merous, unisexual (but seemingly bisexual), or bisexual; bracts small; calyx-tubes entirely connate or almost so; limb very short, usually truncate, rarely with 1 or 2 leaf-like lobes (calycophylly); corolla- lobes valvate in bud, keeled inside; stamens inserted in throat or slightly lower, exsert; filaments short; anthers dorsifixed below the middle; disk annular, glabrous; style dimorphic, glabrous; style-branches (partly stigmatic) 2, narrow; ovary 2-celled or incompletely 4-celled; ovule 1 per cell, attached near base of septum; fruit a 1-pyrenous, 1-seeded drupe, the fruits together forming a fleshy syncarp. Leaves opposite, penninerved, not rarely on upper side with numerous bacteriodomatia, on underside in axils of midrib and nerves with pubescent acarodomatia; stipules interpetiolar. Trees, or erect or climbing shrubs.

According to the record of Index Kewensis and its supplements, there are about 150 *Morinda* species. The following eleven species are

native of Thailand (Smitinand, 1980).

1. *Morinda angustifolia* Roxb.

   ยอดิน Yo din (Trang); สลักบ้าน Salak baan (Northern); สลักป่า Salak paa (Central); เค้าะ Khoh (Karen-Mae Hong Son)

2. *M. angustifolia* Roxb. var. *scrabridula* Craib

   ชรักดง Charak dong, ตึงใส Tueng sai, สลัก Salak (Chiang Mai) สลักป่า Salak paa (Lampang)

3. *M. citrifolia* Linn.

   ยอบ้าน Yo baan, ยอ Yo (Central); มะตาเสือ Ma ta suea (Northern); แยใหญ่ Yae-yai (Karen-Mae Hong Son)

4. *M. coreia* Ham. [= *M. tinctoria* Roxb. (Hooker and Jackson, 1885)]

   สลักป่า Salak paa, สลักหลวง Salak luang (Northern); ยอป่า Yo paa (General); คุย Khui (Phitsanulok); คุ Khu (Karen-Kanchanaburi)

5. *M. elliptica* Ridl. [= *M.citrifolia* Linn. var. *elliptica* Hook. (Craib, 1934)]

   ยอเถื่อน Yo thuean (Chumphon); ยอป่า Yo paa (Trang, Satun); กะมูดู Ka-muu-duu (Malay-Pattani); มูดู Muu duu (Malay-Narathiwat)

6. *M. pandurifolia* Ktze. [= *M. persicifolia* Williams var. *pandurifolia* Pitard (Craib, 1934)]

   ก้ามกุ้ง Kaam Kung (Loei)

7. *M. pandurifolia* Ktze. var. *oblonga* Craib [= *M. persicifolia* Williams var. *oblonga* Pitard, *M. persicifolia* Williams

(Craib, 1934)]

ยอนา Yo naa (Central, Penninsula); ยอน้ำ Yo nam (Chai Nat); ยอป่า Yo paa (Ang Thong); ยอป่าเล็ก Yo paa lek (Nakhon Sawan)

8. *Morinda pandurifolia* Ktze. var. *tenuifolia* Craib
ยอเตี้ย Yo tia (Surat Thani)

9. *M. talmyi* Pierre [= *M. persicifolia* Williams var. *talmyi* Pitard (Craib, 1934)]
ยอเบี้ย Yo bia (Si Sa Ket); ขมิ้นทุ่ง Khamin Thung (Nakhon Ratchasima)

10. *M. tomentosa* Heyne ex Roth [= *M. tinctoria* Roxb. var. *tomentosa* Hook. (Craib, 1934)]
ยอป่า Yo paa, เคาะขมิ้น Khoh Khamin, สะกือ Sakue, สะเกย Sa koei, ทัสเกย Haskoei (Northern); ตะลุมพุก Talum phuk (Khon Kaen); ตะเกรย Ta kraei (Ratchaburi); คุยู่ Khu yuu (Karen-Mae Hong Son, Suai); เควาะ Khwoh (Karen-Kanchanaburi)

11. *Morinda umbellata* Linn.
ยอย่าน Yo yaan (Peninsula)

Various species of *Morinda* have been known as dye plants since the ancient time. In India, cotton, wool and silk were coloured with *Morinda* root-dyes, which are known under the name "al", "ach" "surangi" etc. *M. citrifolia* Linn. and *M. coreia* Ham. are considered to be the chief sources of "al" dye. Some of the other species of this genus, particularly *M. bracteata* Roxb., *M. tomentosa* Heyne ex Roth

and *M. umbellata* Linn. were also exploited for dyes. For the Javanese dyeing industry, *M. citrifolia* Linn. is cultivated. The colouring matter in *Morinda* species was first used experimentally in Europe in 1790 (Burkill, 1966). *Morinda* species yield dyes which give permanent shades of red, purple and chocolate which are produced on mordanted cotton, silk or wool, the shades being fast to soap. These dyes are present chiefly in the root bark, and increase in quantity during the first few years of their growth (Thacker, 1962).

In Thailand, the root of *M. citrifolia* Linn. is used as a cathartic drug, fruits are used to stop vomitting (Pongboonrod, 1971). In Bombay, the leaves are used as a healing application to wounds and ulcers, and are administered internally as a tonic and febrifuge (Kirtikar and Basu, 1975). In Indochina, the fruits are used as medicine for dysentery and asthma; it is also used as a deobstruent and emmenagogue (Burkill, 1966). In Guinea, a decoction of the roots is taken as an emetic and a laxative. An infusion of the leaves is considered emollient, sedative and stomachic. The leaves are also used to relieve fever and headache (Kirtikar and Basu, 1975). In Java, pulp of the seed-freed ripe fruits, are mashed with sugar and drink as a slightly laxative preparation (Burkill, 1966).

An extract of *M. citrifolia* Linn. var. *bracteata* (Roxb.) Hook. is taken to relieve aching bones. It is used in artirheumatic (Perry, 1980).

The stem-bark of *M. lucida* Linn. yields anthraquinones as well as alkaloids. The stem-bark extract of *M. lucida* Linn. has anti-neoplastic property in mice. *M. lucida* Linn. is locally abundant in

Nigeria, where it has a reputation for antipyretic and antimalarial properties (Durodala, 1974).

Morinda species are well-known medicinal plants in many countries in Asia. The chemical study of genus *Morinda* showed the presence of anthraquinones. It is the purpose of this investigation to study the anthraquinone compounds in the root of *M. talmyi* Pierre. Owing to the fact that no work has been done on the chemical study of *M. talmyi* Pierre before, the result may be useful in the anthraquinone study as well as in the chemotaxonomic point of view.

The plant used in this investigation was found in the north-eastern Thailand. There is no record of the medicinal uses of this plant. The specimen of this plant was identified to be *Morinda talmyi* Pierre [Synonym : *M. persicifolia* Williams var. *talmyi* Pitard (Craib, 1934)], family Rubiaceae. A preliminary chemical investigation of this plant showed the presence of anthraquinone. The result was later confirmed by thin-layer chromatography.

M. talmyi Pierre grows wild in the open deciduous forest, open ground, open grassy ground and paddy field of the north-east and the upper part of central Thailand. It is also indigenous to Loas, Cambodia and Vietnam (Craib, 1934). It is small evergreen climbing shrub, 0.5 to 1.0 metre in height. Branches glabrous flexible, slim and brown colour. Leaves opposite, dimorphism; towards the apices of the branches linear, 10-15 cm by 4-8 mm, further down oblanceolate, 6-8 cm by 1.5-2.0 cm, petioles 2-4 mm long, stipules interpetiolar. Flowers in one head, peduncle 1-3 mm long, flowers white, subtended by calyx tubes, corolla 8-10 mm long, lobes 5-6, hairy inside, stamens 6,

epipetalous and introse, ovary inferior, 4-celled, ovule 1 in each cell. Fruit aggregate of druplets (Lecomté, 1924). (Fig. 1, p. 7)

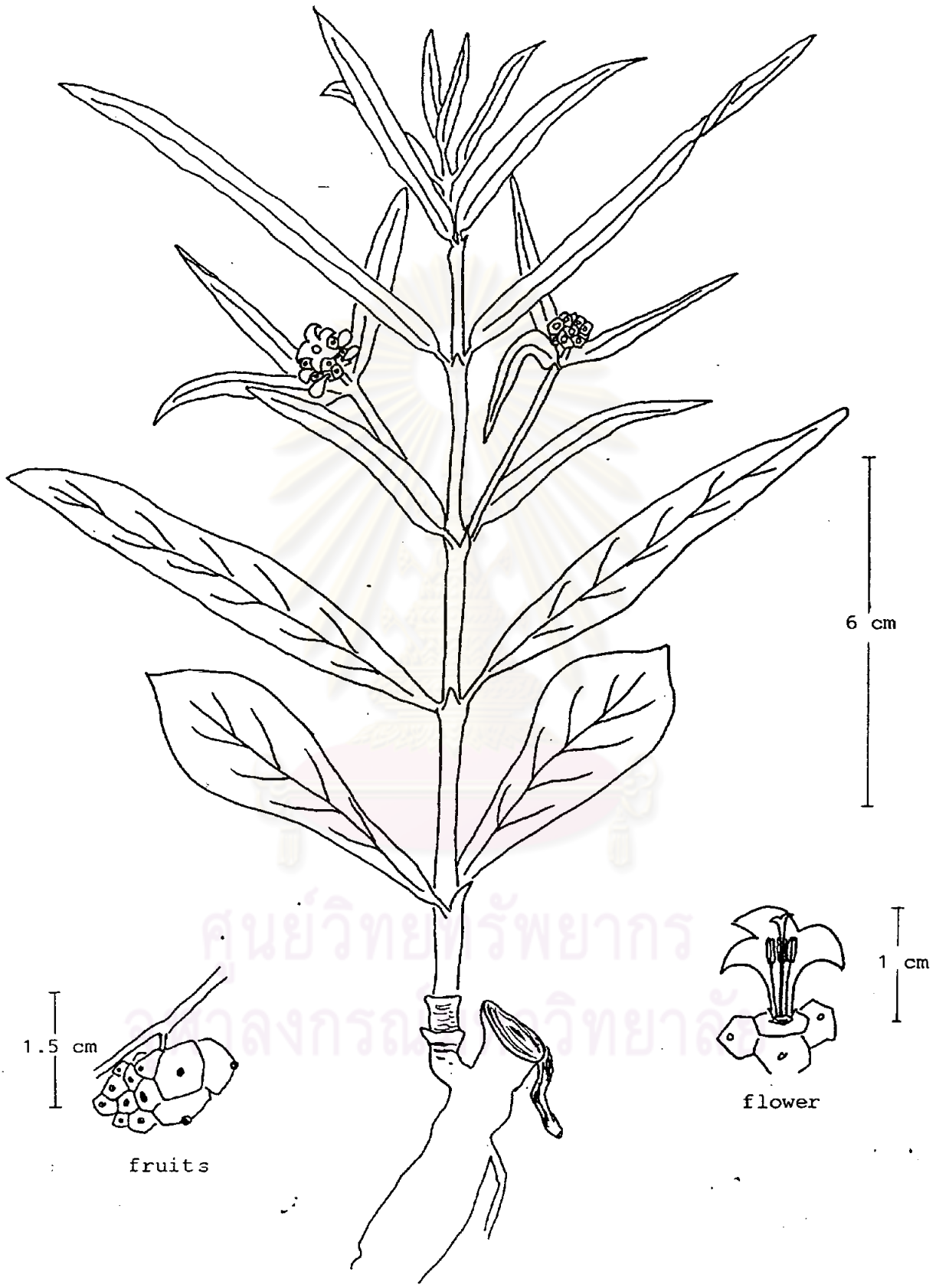

Fig. 1 ยอเบี้ย, ขมิ้นทุ่ง *Morinda talmyi* Pierre, Rubiaceae