CHAPTER I

INTRODUCTION

Polyalthia jucunda (Pierre) Finet & Gagnep. (*Unona jucunda* Pierre) is a plant belonging to the family Annonaceae, a large and diverse family with about 130 genera and 2,300 species. In Thailand, annonaceous plants are arranged into about 41 genera and 195 species (ปียะ เฉลิมกลิ่น, 2544). *Polyalthia jucunda* (Pierre) Finet & Gagnep. is known in Thailand as Yang Leang (ยางเหลือง).

Trees up to 25 m high, trunk to 40 cm, bark dark gray. Branches pubescent when young, glabrescent. Petiole 5-8 mm, puberulous, with transverse rugose striations; leaf blade oblong to oblong-elliptic, 8-20 x 3.5-8 cm, subleathery to leathery, glabrous, adaxially shiny, base broadly acute to rounded, apex acuminate, lateral veins 14-18 pairs, parallel, ascending to margin, abaxially elevated, and adaxially conspicuous. Inflorescences axillary or on old branches, several-flowered; bractlet broadly ovate. Pedicel 1.5-3 cm, puberulous bracteolate at base. Sepals broadly ovate, calyx 5 x 5 mm, obtuse to acute, outside puberulous, inside glabrous. Petals yellowish, oblong-ovate to ovate-lanceolate, 2-3.5 x 1-1.5 cm; outer petals slightly shorter than inner, outside puberulous to glabrous, inside glabrous. Stamens cuneate; connective apically obtuse, concealing anther locules. Carpels numerous, oblong, densely pubescent; ovule 1, basal. Stigma scapitate. Fruiting pedicels 3.5-4 cm; stipes 2.5-5 cm; carpels red, ovoid-ellipsoidal, 2.5-5 x 1-2 cm, glabrous, apex obtuse. Flowers. Apr-Jul, fruits. Oct-Dec. (Flora of China, Vol. 7)

The plant can also be found in Bangladesh, Sri Lanka, India (Musa, Zarga and Shamma, 1982; Hasan, Hossain and Rashid, 1995), Malaysia (Connolly, Haque and Kadir, 1996; Lee, Chunh and Goh, 1997), Philippines (Ma *et al*, 1994) and in China (Hao *et al*, 1995; Lue *et al*, 1998). It is usually found growing in evergreen rain forest (Hasan, Hossain and Rashid, 1995; ปียะ เฉลิมกลิ่น, 2544).

The genus *Polyalthia* comprises of 311 species. (The International Plant Names Index, 2004.) In Thailand, can be found about twenty-seven species (ส่วนพฤกษศาสตร์ป่าไม้ สำนักวิชาการป่าไม้, 2544; ปียะ เฉลิมกลิ่น, 2544).

1. *P. asteriella* Ridl. (ยางโอน)
2. *P. bullata* King (หลังโกง)
3. *P. cauliflora* Hook. f. & Thomson var. *desmatha* (Hook. f. & Thomson) (จำปาขอม)

4. *P. cerasoides* (Roxb.) Benth. ex Bedd. (กะเจียน)
5. *P. cinnamomea* Hook. f. & Thomson (สังหยูดอกแดง)
6. *P. crassa* Parker (นมแมวน้อย)
7. *P. debilis* (Pierre) Finet & Gagnep. (กล้วยเต่า)
8. *P. evecta* (Pierre) Finet & Gagnep. (นมน้อย)
9. *P. glauca* (Hassk) (ตารา)
10. *P. hypoleuca* Hook. f. & Thomson (สังหยูขาว)
11. *P. jenkensii* (Hook. f. & Thomson) Hook. f. & Thomson (สังหยู)
12. *P. lateriflora* (Blume) King (กระดังงาป่า)
13. *P. longifolia* (Benth) Hook. f. (อโศกเซนคาเบรียล)
14. *P. obtusa* Craib (ยางดง)
15. *P. parviflora* Ridl. (กำลังวัวเถลิง)
16. *P. sclerophylla* Hook. f. & Thomson (กล้วยไม้)
17. *P. socia* Criab (กาโป้)
18. *P. stenopetala* (Hook. f. & Thomson) Ridl. (หนวดปลาดุก)
19. *P. suberosa* (Roxb.) Thwaites (กลึงกล่อม)
20. *P. viridis* Craib (ยางโอน)
21. *P. clavigera* King (ยางปุ่ม)
22. *P. dubia* (ตับเต่า)
23. *P. hookeriana* King (หมากหน่วยแดง)
24. *P. jucunda* (Pierre) Finet & Gagnep. (ยางเหลือง)
25. *P. modesta* (Pierre) Finet & Gagnep. (ฉัตรลีลา)
26. *P. rumphii* (Blume ex Hensch.) Merr. (นวลเขา)
27. *P. simiarum* Benth. & Hook. f. (ยางยืด)

Traditional uses of various *Polyalthia* species have been reported. Indo-China people use the bitter bark of *Polyalthia thorelii* to treat stomach trouble. In Malay Peninsula, the leaves of *P. bullata* are used for rheumatoid arthritis and the pounded leaves of *P. cauliflora* are applied as a poultice on skin affections. A decoction of the roots of *P. hypoleuca* may be used after childbirth. The fruits of *P. sumatrana* is for intoxication. In the Philippines, a decoction of the fresh roots of *P. suberosa* may be used as an abortifacient (Quisumbing, 1951; Perry, 1980).

In Thailand, *Polyalthia stenopetala* Ridley is used ethnomedically as a remedy for fever, disease of blood system and antitussives (นันทวัน บุญยประภัศร และ อรนุช โชคชัยเจริญพร, 2543). A

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The plants of this genus have been found to afford a variety of secondary metabolites, including aporphine (Hamonnière *et al*, 1977; Jossang *et al*, 1984; Wu *et al*, 1990; Connolly *et al*, 1996; Kanokmedhakul *et al*, 2003), azaanthracene (Tuchinda *et al.*, 2000), azafluorene (Wu *et al*, 1990), indolosesquiterpene (Hamonnière *et al*, 1977; Okorie, 1981; Hocquemiller *et al*, 1981) and protoberberine alkaloids (González *et al*, 1997, Chen *et al*, 2000; Faizi *et al*, 2003), benzopyran derivatives (Zafra-Polo *et al*, 1996), clerodane (Kijjoa *et al*, 1989; Kijjoa *et al*, 1990; Kijjoa *et al*, 1993; Ma *et al*, 1994; Hao *et al*, 1995; Hara *et al*, 1995), halimane (Hara *et al*, 1995; Chen *et al*, 2000) and labdane diterpenes (Richomme *et al*, 1991), diynoic acids (Kanokmedhakul *et al*, 1998; Tuchinda *et al*, 2001), *N-trans*-coumaroyltyramine (Tuchinda *et al*, 2001) and lanostane-type triterpenes (Li *et al*, 1993; Lue *et al*, 1998). Some of these compounds have been found to exhibit interesting biological activity. While some of the aporphine alkaloids and clerodane diterpenes exhibited a cytotoxic effect on human cancer cell lines (Wu *et al*, 1990; Ma *et al*, 1994), the labdane diterpene was found to possess the leishmanicidal activity (Richomme *et al*, 1991). Interestingly, the C_{31} lanostane-type triterpene suberosol, isolated from *Polyalthia suberosa* was shown to exhibit the anti-HIV replication activity (Li *et al*, 1993; Tuchinda *et al*, 2001). In addition the dimeric aporphine alkaloids bidebilines C and D, which are constituents of the roots of *Polyalthia debilis* were found to exhibit a moderate antimalarial activity against the multidrug resistant strain of *Plasmodium falciparum* (Kanokmedhakul *et al*, 2003).

Up to now, phytochemical and biological activity study of *Polyalthia jucunda* has never been reported. Preliminary examination of this plant revealed positive test for phenolic compounds and terpenoids. Therefore, it is the purpose of this investigation to study the nature of the compounds in the stem bark of *Polyalthia jucunda* (Pierre) Finet & Gagnep. The result of this investigation may serve as an additional information on the chemical nature of this plant family, which could be a valuable lead in the fields of chemotaxonomy, phytochemistry and biological activity.

Figure 1. ***Polyalthia jucunda*** **(Pierre) Finet & Gagnep.**

(Photographed by Assistant Professor Surapong Kengthong; ปิยะ เฉลิมกลิ่น, 2544).