



CHAPTER I

INTRODUCTION

The genus *Garcinia* belongs to the tribe Garcinieae of the family Guttiferae, subfamily Clusioideae, order Guttiferales. The genus *Garcinia* is made up of 400 species, widely distributed in Tropical Asia, Africa and Polynesia.(Hooker, 1872)

The plants in the genus *Garcinia* are trees, usually with yellow juice. **Leaves** evergreen, coriaceous, very rarely stipulate. **Flowers** solitary fascicled or paniced, axillary or terminal, polygamous. Sepals 4-5, decussate. Petals 4-5, imbricate. Male flowers : Stamens ∞ , free or collected into a ring or an entire globose or conical 4-5 lobed mass, usually surrounding a rudimentary ovary ; anthers sessile or on short thick filaments, 2-rarely 4-celled, adnate or peltate, dehiscing by slits or pores or circumsciss. Female flowers : staminodes $8-\infty$, free or connate. Ovary 2-12 celled ; stigma sessile or subsessile, peltate, entire or lobed, smooth or tubercled ; ovules solitary in each cell, attached to the inner angle of the cell. **Berry** with a coriaceous rind. **Seeds** with a pulpy aril (Hooker , 1872).

According to Smithinand (1980) , the species of genus *Garcinia* found in Thailand are as followed.

Garcinia acuminata Planch. & Triana
(*G. elliptica* Wall.)

จังหวัด รong thong (Nakhon Si
Thammarat).

<i>G. atroviridis</i> Griff.	มะขามแขก Ma khaam khaek, ส้มมะวน Som ma won (Peninsular) ; ส้มแขก Som khaek, ส้มพะงุน Som pha ngun (Pattani) ; ส้มควาย Som khwaai (Trang) ; อาแซกะลู่โก Aa-sae ka-luu-ko (Malay-Yala).
<i>G. costata</i> Hemsl.	มะพืง Ma pueng (Lampang) ; มังคุดป่า Mangkhut paa (Satun).
<i>G. cowa</i> Roxb.	กะมวง Ka muang (Peninsular) ; ชะมวง Cha muang (Central) ; มวงส้ม Muang som (Nakhon Si Thammarat) ; หมากโมก Maak mok (Udon Thani).
<i>G. dulcis</i> (Roxb.)Kurz	มะพุด Ma phuut (Pattani).
<i>G. fusca</i> Pierre	มะคั้นป่า Madan paa (Maha Sarakham); หมากโมง Maak mong (Kamphaeng Phet).
<i>G. gracilis</i> Pierre	บงนั้ง Bong nang (Sakon Nakhon) ; หมักแปม Mak paem (Nong Khai).
<i>G. hanburyi</i> Hook.f.	รง Rong (Chanthaburi, Trat) ; Gum Cambodge Tree.
<i>G. hombroniana</i> Pierre	วา Waa (Yala).
<i>G. lanessanii</i> Pierre	ส้มกุงใหญ่ Som kung yai (Khon Kaen).
<i>G. mackeaniana</i> Craib	มะดะ Mada (Phrae).
<i>G. mangostana</i> Linn.	มังคุด Mangkhut (General);Mangosteen.
<i>G. merguensis</i> Wight	กะนวน Ka nuan (Peninsular) ; ขนมปัง Khanom pang, ขี้พืง Khee phueng (Chanthaburi) ; ซาแป Saa-pae (Malay-

	Narathiwat) ; นวล Nuan (Northern) ; นวลขาว Nuan khao, นวลดง Nuandong (Surat Thani) ; นวลแดง Nuan daeng (Chumphon) ; นวลเป้ง Nuan paeng (Nakhon Si Thammarat) ; บุญยง Bun yong (Lampang) ; ม่วงนก Muang nok (Ranong) ; ยางเขา Yaang khao (Trat). ชะมวงน้ำ Cha muang nam (Yala) ; พุด Phuut (Trang, Nakhon Si Thammarat); มะพุดป่า Ma phuut paa (Pattani) ; มูลู Muu-luu (Malay-Pattani).
<i>G. nervosa</i> Miq.	
<i>G. nigrolineata</i> Planch.	ชะมวง cha muang (Trat).
<i>G. rostrata</i> Benth.& Hook.f.	กระดุกนก Kraduuk nok (Trat) ; ม่วงลาย Muang laai (Surat Thani) ; ยายปลวก Yaai pluak (Trang).
<i>G. schomburgkiana</i> Pierre	มะดัน Madan (Central).
<i>G. speciosa</i> Wall.	ก๊วกไหม Kwak mai, หมากก๊วก Maak kwak (Neng Khai) ; กะวา Kawaa, พะวา Phawaa (Surat Thani) ; ขวาด Khwaat (Chiang Rai) ; ชะมวง Cha muang (Phichit) ; มะระขึ้นก Mara kheenok (Chiang Mai);มะป่อง Mapong(Northern) ; วาน้ำ Waa nam (Trang) ; สารภีป่า Saraphee paa (Central, Chiang Mai).
<i>G. succifolia</i> Kurz	มะป่องต้น Mapong ton (Northern).
<i>G. thorelii</i> Pierre	ก๊อก Kok (Phitsanulok) ; ครากขม ^ข มิน

- G. vilersiana* Pierre Khraak khamin(Lampang); มะคะขี้หนอน
Mada kheenon (Chiang Rai).
- G. xanthochymus* Hook.f. ไ้จระเข้ Khai chorakhe, ตะพุด Taphuut
(Chanthaburi) ; จำพุด Cham phuut
(Central) ; ปราโฮด Praa-hot (Khmer-
Surin) ; ประพุด Pa huut (Northeastern);
พะวาใบใหญ่ Phawaa baiyai(Chon Buri,
Chanthaburi) ; มะพุด Ma phuut(Central,
Peninsular) ; ส้มปอง Som pong , ส้มม่วง
Som muang (Chanthaburi).
- G. xanthochymus* Hook.f. จะคำสา Cha-khaa-saa (Karen-Mae Hong
son) ; มะคะ Mada (Northern) ; มะคะ
หลวง Mada luang (Chiang Mai) ;
Egg Tree.

Garcinia atroviridis Griff. is a tree of fair size, young branches stout, terete ; bark black when dry. **Leaves** 6-9 by 2-2.5 inch, thickly coriaceous, dark green, shining, abruptly acuminate, base contracted ; vien 1/6 inch apart, prominent on both surfaces, anastomosing along the margin ; petiole 1 inch. **Female flowers** large, 1.25 inch diameter ; pedicel 1 inch **Sepals** spreading, large, orbicular, concave, blood-red within. **Petals** obovate, fleshy, coloured like the sepals, tip recurved. **Stamens** united below into a ring. **Ovary** subangled, 10-celled ; stigma sessile sub-4-gonal, minutely tubercled, broader than the ovary : ovary 9-celled ; stigma closely adherent to the ovary, large, orbicular, convex, blood-red, fleshy, margin obscurely lobed. Ripe fruit 3 inch long, subglobose, base slightly 9-lobed, dull yellow, crowned by the at length concave stigma (Hooker , 1872).

The *Garcinia* spp. are used for various medicinal purposes (Perry, 1980).

Burma : A preparation of the fruit of *G. xanthochymus* Hook.f. is given to treat bilious conditions, diarrhea and dysentery (Perry, 1980).

Thailand : The gum resin (gamboge) of the bark of *G. hanburyi* Hook.f. is a drastic purgative, an emetic and a vermifuge to treat tapeworm and in too large doses can be fatal. It is rarely administered unless mixed with other substances such as calomel or aloes. It has gradually gone out of use and now is used only as coloring matter. The resin is reported to contain cambogic acid and three garcinolic acids. Most parts of *G. mangostana* Linn. are astringent, but the powdered rind of the dried fruit is most efficacious. Either the bark or the pericarp (fruit rind) is used in treating diarrhea and dysentery. Further, external applications of the prepared pericarp are as in a clyster and a sitz bath, also to treat atonic ulcers and swollen tonsils (Perry, 1980).

Indo-china : *G. cambogia* (Gaertn.) Desr., has data similar to that for *G. hanburyi*, but it loses its properties if soaked in vinegar. Cambogin, one of its principles, is said to be irritant, purgative and toxic. The bark of *G. delphyana* Pierre is also purgative. That of *G. harmandii* Pierre, with other ingredients, is used as an astringent to treat diarrhea. The bark of *G. oliveri* Pierre with that of *G. vilersiana* Pierre, crushed with a little alcohol, makes a poultice to apply to sprains and morbid wounds. The rind of the fruit of *G. oliveri* is used in a preparation to treat bronchitis. The mesocarp of the fruit of *G. cochinchinensis* (Lour.) Choisy is astringent useful against diarrhea (Perry, 1980).

Malay Peninsula : A decoction of the leaves and root of *G. atroviridis* Griff. is dropped into the ear to treat earache ; the sap of the leaves is given as a post partum protective medicine and a lotion containing the crushed fruit and other ingredients is rubbed over the body at the same time. The acid fruit of some species are part of some external healing applications. The pounded seed of *G. dulcis* (Roxb.) Kurz with water, vinegar and salt is applied externally to resolve glandular swellings. The juice of the roots of *G. gaudichaudii* Planch. is rubbed on cuts. The root of *G. hombroniana* Pierre is used in a post partum protective medicine. The root and leaves are prescribed to treat itch. Juice squeezed from the leaves of *G. nigrolineata* Planch. rubbed with a little salt is dropped into running eyes connected with ulceration of the nose caused by syphilis or cancer. A decoction of the root of *G. mangostana* L. may be given to treat irregular menstruation and a decoction of the leaves with unripe bananas and benzoin is applied externally to such wounds as those of circumcision (Perry, 1980).

Indonesia : The gum which flows from the wounded bark of *G. latissima* Miq. is used on leg wounds. Sap from the bark of *G. macrophylla*, if in contact with the skin, causes itch. The milky sap of *G. celebica* Linn. is known as poisonous (Perry, 1980).

Philippines : Leaves of *G. oligophlebia* are applied to treat internal pain. The gum resin of *G. venulosa* (Blco.) Choisy is used as gamboge (Perry, 1980).

New Guinea : The latex of an undetermined species is applied to sores. The gum resin from *G. morella* Desr. is exported to China for external

medicinal use only, either alone as powder or as an ingredient in treatment for wounds of all kinds, cancerous sores, indolent ulcers and to cause decayed teeth to drop out. Reported constituents are gum, resin, starch and gambogic acid. The Chinese regard it as very poisonous. The main symptoms of poisoning are abdominal pain, diarrhoea and lowering of blood pressure. Conflicting reports come from India concerning the antibacterial activity of the morellin in the yellow pigment of the seed and pericarp (Perry, 1980).

The previous phytochemical study of *Garcinia atroviridis* Griff. was reported to contain (-)-hydroxycitric acid from its fruit (Lewis, 1965). It interests the author to investigate the chemical compound in this plant for more information on chemistry and chemotaxonomy. This investigation deals with the isolation of chemical compounds from the stem bark of *G. atroviridis* Griff. and the structural analyses by means of spectroscopy.