CHAPTER I
INTRODUCTION

Diospyros ehretioides Wall.ex G. Don belongs to the Ebenaceae family[1]. It is also called by other names such as Chin Kwang (ชิ้นกวาง), Ruean Kwang (เรื้อนกวาง), Lin Kwang (ลิ้นกวาง), Taptao ton (ตับเต่าต้น), Taptao Luang (ตับเต่าหลวง), Ma ko pa (มะโกป่า), Ma mang (มะมัง), Ma fai phi (มะไฟผี), Ma miang (มะเมียง), Huean Kwang (เฮื้อนกวาง), Haet Kwang (แฮด กวาง).

Diospyros ehretioides is a deciduous tree up to 15 m high. It has ovate to elliptic, nearly glabrous, about 7-30 by 5-21 cm leaves. Fruiting calyx lobes are broadly plicate, tomentose when young[2]. The fruit is green and spherical, about 1-2 cm in diameter (Figure 1). It is widely distributed in Cambodia, India, Myanmar and Thailand. It is found in various parts of Thailand such as in the northern; Chiang Mai, Chiang Rai, Lumpang, Phitsanulok, Phrae, Tak and Uttaradit province; north-eastern: Khon Kaen, Surin, Chaiyaphum, Nakorn Ratchasima and Ubon Ratchathani province; south-western: Kanchanaburi, Prachinburi province and; central: Ratchaburi province.

Figure 1. The fruits of *Diospyros ehretioides*

The genus *Diospyros* has been recently taxonomically revised to contain about 500 species which are widespread chiefly in tropical and subtropical countries including Thailand. Almost all parts of these plants have been used as local herbal medicines[3]. The leaves are used for lumbago; the fruits are carminative, astringent and cure biliousness; the seeds possess sedative effect; and the barks are astringent and febrifuge. Moreover, *Diospyros* species are used as food plants by the larvae of some *Lepidoptera*ns, including double-stripped pug, *Eupseudosoma aberrans*, snowy Eupseudosoma and *Hypercompe indecisa*. The stems of *Diospyros maritima* Blume have been used in the treatment of rheumatic disease in the traditional regimen of Taiwan[4].

Diospyros has been used as traditional medicine in Thailand. This also includes *Diospyros ehretioides*. A decoction of root is used for treatment of emetic and diarrhea and a decoction of bark also used for antidiuretic. Moreover, its timbers have been used for posts and poles; fruits used for fish poisoning[3].

Many *Diospyros* species have been reported to exhibit interesting biological and pharmacological activities. Some of the significant biocidal reports are: (i) the

wood of *Diospyros virginiana* has been isolated as the chief constituents, was reported to exhibit termicidal activity[3]; (ii) the chief constituents of *Diospyros kaki*, is reported to exhibit antifeedant activities, insecticidal, insect growth regulator and sterilant activities[3]; (iii) in a major plant screening programme, the leaves of *Diospyros diepenhorstii* of Thailand were found to exhibit piscicidal and molluscicidal activities[3]; and (iv) the petrol, chloroform and methanol extracts of root bark of *Diospyros zombensis*[5] and the alcoholic extract of *Diospyros usambarensis*[5] showed molluscicidal and fungicidal activities. *Diospyros ehretioides* have been few reported on its chemical constituents[6], however, it has never been biologically explored, and this is the first report on bioactive compounds from this plant. Therefore, this study will focus on the isolation, structure elucidation and biological activities of substances from the fruits of *Diospyros ehretioides*.

Besides, biological activities of isolated compounds will also be compared with isolated compounds from other *Diospyros* spp. such as *Diospyros rhodocalyx* and *Diospyros glandulosa* in which their wood parts have never been chemically and biologically reported.

Diospyros rhodocalyx, a tree up to 15 m high, leaves ovate or obovate[2], is found in the north-eastern part of Thailand. It is known in Thai as Tako na (ตะโกนา)[1] and also known in Thai tradition medicine. The fruits are used for treatments of diarrhea, bleeding, abdominal discomfort, parasitic infection abscess and renal disease; the bark is used for symptomatic relief of leucorrhea and as antidiuretic.

Diospyros glandulosa, a timber tree, is found in the northern part of Thailand, India and Myanmar. It has corolla-lobes glabrous or only hairy along mid-line, hairy leaves. The local name of this plant is Kluai ruesi (กล้วยฤาษี).

Thus, the objectives of this study were:

1. To isolate and elucidate chemical structures of *Diospyros ehretioides* fruits
2. To evaluate biological activities of the isolated compounds
3. To prove whether the bioactive compounds of *Diospyros ehretioides* fruits are plant or fungal metabolites
4. To compare biological activities of the isolated compounds from *Diospyros ehretioides* with isolated compounds from other *Diospyros* spp.