

Aquilaria rugosa (Thymelaeaceae) : A New record for Thailand

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ABSTRACT : *Aquilaria rugosa* L.C. Kiet & Kessler was thought to be an endemic to Vietnam, but is also occurs extending to northern Thailand. It differs from *Aquilaria crassna* most notably in its seed and appendage densely covered with brownish hairs, capsules pyriform or globose, it has ornamented exocarp surface heavily rugose when dry, described, photographed and a distribution map.

INTRODUCTION

The genus *Aquilaria* is the most important wood for incensed resin formation, a genus of the family Thymelaeaceae and is about 20 species (Kiet et al., 2005) which has distributed from India, Burma, Indochina (Lecomte, 1915), SE China and widespread in SE Asia (Hou,

1960, 1964). In Thailand so far 4 species recorded namely, *A. malaccensis* Lamk., *A. crassna* Pierre ex Lec., *A. subintegra* Hou, and *A. hirta* Ridl. (Peterson, 1997). During 2004-2005, I had done fieldwork of incensed wood formation in agarwood research project and found a new record of *Aquilaria* in northern Thailand.

Key to species of the genus *Aquilaria* (Thymelaeaceae) in Thailand (modified from Peterson, 1997)

1. Floral tube (both calyx tube & corolla tube) campanulate, 3-5 mm long
 2. Pedicels 2-5 mm long. Calyx lobes 2-3 mm long. Exocarp smooth when fruit maturity
A. malaccensis
 2. Pedicels 5-10 mm long. Calyx's lobes 3-6.5 mm. long. Exocarp hairy and slightly rugosa to heavily rugose when maturity or dry
 3. Stigma capitate. Capsules obovoid, slightly rugosa, 25-35 by 20-25 mm.
A. crassna
 3. Stigma irregularly lobed. Capsules globose or pyriform, surface heavily rugose, 20 by 20 mm.
A. rugosa
1. Floral tube cylindric, 5-12 mm long
 4. Leaves 14-28 by 5-11 cm. Capsules elliptic; seed narrowly elliptic
A. subintegra
 4. Leaves 6.5-14 by 2.5-5.5 cm. Capsules oblanceolate; seed ovoid
A. hirta

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Figure 1 Photographs of capsule (a) and seeds (b) of *Aquilaria rugosa* L.C. Kiet & Kessler

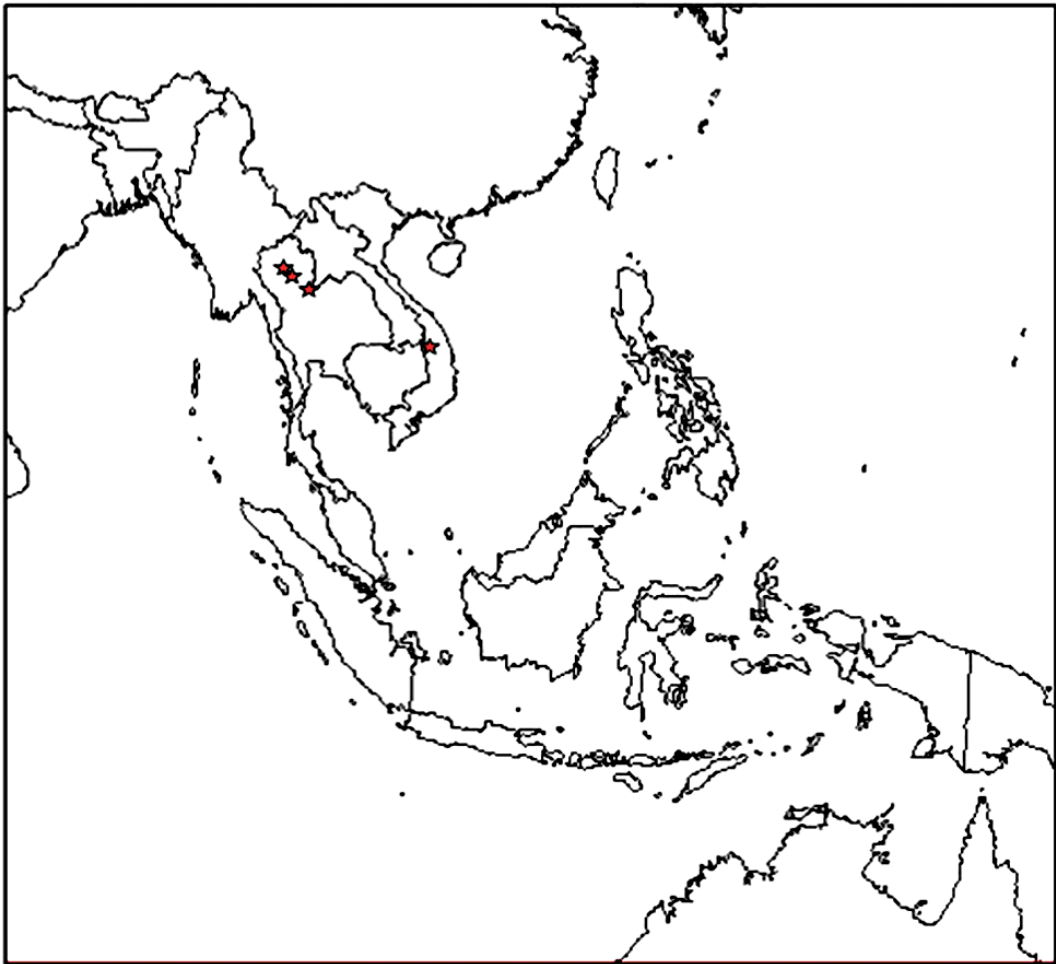


Figure 2 Collected localities of *Aquilaria rugosa* L. C. Kiet & Kessler in Thailand reported by author and in Vietnam by Kiet *et al.*, (2005) (★).

Aquilaria rugosa L.C. Kiet & Kessler in Blumea 50: 135-141. 2005.

Tree up to 10 m high (in Vietnam; Kiet *et al.*, 2005) and up to 25-35 m high (in Thailand), bole straight up to 10-15 m. Stem bark grey, rugose with a fine reticulate of polygonal fissured; woody twigs with reddish brown bark, longitudinally fissured, glabrescent; young twigs densely pubescent. Foliar buds covered with silky hairs. Leaves ovate to obovate, 6-10 by 3.0-4.8 cm (8-10 (-12) by 3.5 - 4.5 cm in Vietnam; Kiet *et al.*, 2005), chartaceous to subcoriaceous, dull, base acute (attenuate or obtuse, rare rounded in Vietnam; Kiet *et al.*, 2005), margin slightly recurved, white ciliate; apex acute to apiculate (shortly acute to acuminate in Vietnam; Kiet *et al.*, 2005), the acumen up to 1 cm long, both surfaces mostly glabrous, midrib sparsely appressed hairy beneath, depressed above, veins 20-25 pairs, subparallel, distinct beneath, obscure above, simple or sometimes forked, slightly curved and ascending towards the thickened marginal vein. Petiole 5-6 mm long (5-7 mm long in Vietnam; Kiet *et al.*, 2005), pubescent when young, canaliculated above. Inflorescences terminal on young twigs, or on short lateral branchlets, cyme or umbelliform, 1-, 2- or many- (8-15) flowered umbels, or sometimes branched with 2-3 umbels and each with 5-15 flowers, more rarely a simple umbel; umbel with a short peduncle or subsessile, densely hairy, usually with a few small (caducous) bracts; pedicels 0.8- 1 cm, setose. *Hypanthium* (floral tube) whitish to yellowish, shortly tubular, funnel- or bell-shaped, 4.5-6.5 mm long, villous on both surfaces, distinctly 10 ribbed outside; calyx lobes 5, slightly ovate to deltoid, spreading or reflexed, villous, as long as the corolla tube. *Petaloid appendages* ovate or semi-orbicular, c. 1 mm long, densely villous, inserted slightly behind the stamens, free, about half-shorter than stamens. *Stamens* 10, inserted in 2 whorls slightly below

the petaloid appendages, all with fleshy filaments, glabrous. Pistil c. 2 mm long, hairy. Ovary rectangular in cross section, 2.5-3.5 mm long, villose, 2-celled; 1 ovule per cell, hanging near the top of the ovary; style obscure or absent; stigma irregularly lobed, light brown. *Infructescences* terminal, umbelliform, sessile or on 1-2 mm long peduncles bearing 5-8 fruits. Pedicels c. 10 mm long. Capsules globose or pyriform, ash grey when dry, 2.3-2.5 by 2.5-3.0 by 1.8-2.0 cm, 2-celled, truncate to depressed at the apex, constricted at the base into a 2-3 mm long stipe, hypanthium (floral tube) persistent, campanulate, entire, c. 11 mm long, distinctly 10 ribbed outside, transverse section of capsule 2.3-2.5 cm across, marked by 4 lines, of which 2 prominent ones belong to the suture; valves 2, thick, angle of dehiscence to 180° at the very maturity, mesocarp spongy when young exocarp rugose outside at maturity when dry, pericarp woody at maturity or when dry. Seed 2, ovoid, dark-brown, 6.0-7.5 by 4.0-6.0 mm (7.5 by 6.5 mm in Vietnam; Kiet *et al.*, 2005), acute at the apex; caruncle-like appendage as long as the seed, brownish red, twisted when dry; seed and appendage densely covered with brownish hairs (Figure 1).

Distribution.- Vietnam, Thailand (Laos?), See Figure 2.

Thailand.- Phitsanulok [Chat Trakarn, 9 July 2006, Wichan Eiadthong W.1/2549 (BKF, 2 sheets)], Chiang Mai [Mae On, 20 June 1999, S. Watthana, R. Panya, W. Pongamornkul, WP. 456 (QBG No.15349); Mae Rim, 10 July 1996, QBG Staff (QBG No.6757)]

Ecology.- In lower montane evergreen forest, altitude 900-1,200 m. Flowering; March, Fruit maturity; June-July.

Vernacular name.- Krissana Doi (กฤษณาตอย) [given by author, meaning; Mountain agarwood]

Conservation status.- *Aquilaria rugosa* is recorded from 3 localities in Thailand.

I can consider that the species in its original habitat is rare and endangered by illegal logging.

Notes.- Their morphological characters are similar to *A. crassna* by vegetative parts, but it differs from the others by seed and appendage densely covered with brownish hairs, capsules pyriform or globose and it has ornamented exocarp surface heavily rugose when dry.

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