

The genus *Diplycosia* Blume (Ericaceae) in Thailand

SANTI WATTHANA*

Queen Sirikit Botanic Garden, The Botanical Garden Organization, Chiang Mai 50180, Thailand

ABSTRACT. A taxonomic revision of the genus *Diplycosia* Blume in Thailand is presented. Three species are recognized. A key to the species, descriptions, ecological data and geographical distributions are provided.

KEYWORDS: Taxonomy, *Diplycosia* Blume, Thailand

INTRODUCTION

Diplycosia Blume (Ericaceae) is mainly distributed in the Malesian region and comprises *ca.* 100 species. It belongs to tribe Gaultherieae Niedenzu (Stevens *et al.*, 2004) and is closely related to *Gaultheria* L. but differs in its stamens presenting tubules and lacking terminal awns which are found in the *Gaultheria*. Fletcher (1938) listed three species of *Diplycosia* in the Florae Siamensis Enumeratio, namely *D. epiphytica* H.R. Fletcher, *D. latifolia* Blume and *D. microphylla* Becc. Later, Sleumer (1957, 1967, 1969) presented a revision of *Diplycosia* for Flora of Malesiana, which included species found in Thailand. The present work is a part of the revision of the Ericaceae for the Flora of Thailand and shows that all the species of *Diplycosia* are restricted to southern Thailand. *Diplycosia epiphytica* is recorded as endemic to Thailand.

MATERIALS AND METHODS

This treatment for the Flora of Thailand is based on the examination of 10 specimens which are collected in Thailand depositing at BK, BKF, E, K, L and QBG. Abbreviations follow Thiers (2010). Comparative morphology was used to delimit species in all cases.

TAXONOMIC TREATMENT

DIPLYCOSIA

Blume, Bijdr: 857. 1826; Miq., Fl. Ind. Bat. 2: 1054. 1859; Benth. & Hook.f., Gen. Pl. 2. 583. 1876; Drude in Engl., Nat. Pflanzenfam. 5(1): 46. 1891; King & Gamble, J. As. Soc. Beng. 74(2): 70. 1906; Ridl., Fl. Mal. Pen. 2: 213. 1923; Sleumer, Reinwardtia 4(2): 120. 1957; Blumea 11: 4. 1961; 12: 116. 1963; 12: 342. 1964; Fl. Males. 6(5): 696. 1967; Stevens *et al.*, in

* Corresponding author: santiqsbg@gmail.com

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Kubitzki, *Fam. & Gen. Vas. Pl.* 6: 182. 2004. —*Diplycosia* G. Don, *Gen. Syst.* 3: 788. 1834. —*Gaultheria* sect. *Amphicalyx* Engl., *Gen.*: 756. 1839. —*Pernettyopsis* King & Gamble, *J. Asiat. Soc. Bengal* 74: 79. 1905; Sleumer, *Fl. Males.* 6(5): 675. 1967.

Shrubs or epiphytes, sometimes roots and stem base swollen. *Leaves* spiral, entire, serrate or crenate; axillary buds sometimes reduce to stipule-like perulae. *Flowers* axillary, solitary or in fascicles, small. *Pedicels* bracteolate at base, with 2 apical persistent bracteoles (not or) connate to calyculus. *Calyx* deeply 5-lobed, becoming fleshy and accrescent as flower ages, mostly to completely including the capsule at maturity. *Corolla* campanulate to urceolate,

fleshy, with 5 slightly imbricate, usually recurved lobes, early caducous. *Stamens* 10, mostly as long as the corolla or slightly exerted, rarely shorter than the corolla, inserted at the base of the corolla; anthers introse, dorsifixed, anther-cells oblong to ovate, with 2 deep longitudinal grooves, mostly very granular, produced into 2 short or elongate tubules at the apex, dehiscing by ± oblique short or prolonged slits with neither apical nor dorsal appendages. *Filaments* mostly linear, flat. *Disk* 10-lobed. *Ovary* superior, 5-celled, each with numerous ovules on the thick placentas; style filiform; stigma simple. *Capsule* surrounded by fleshy calyx; seeds minute, cuneate irregularly; testa reticulate.

KEY TO THE SPECIES

1. Branches with densely setose hairs. Leaves 3-nerved or (sub-) palmate veins 2
 1. Branches glabrous. Leaves not 3-nerved **3. D. heterophylla** var. **latifolia**
 2. Leaves less than 3 cm long, apex obtuse or shortly apiculate **1. D. microphylla**
 2. Leaves more than 3 cm long, long acuminate **2. D. epiphytica**

1. *Diplycosia microphylla* Becc., *Malesia* 1: 212. 1878; Clarke in Hook.f., *Fl. Br. Ind.* 3: 458. 1882; Ridl., *J. Str. Br. R. As. Soc.* 23: 146. 1891; *J. Fed. Mal. St. Mus.* 10: 145. 1920 & *Fl. Mal. Pen.* 2: 213. 1923; Burk. & Henders., *Gard. Bull. S. S.* 3: 390. 1925; H.R. Fletcher in Craib, *Fl. Siam En.* 2: 315. 1938; Sleumer, *Reinwardtia* 4(2): 146. 1957. Type: Borneo, Sarawak, Mt. Mattang, top, *Beccari P.B.* 2931 (cited erroneously as “Beccari 2031” in the protologue cf. Sleumer, *Reinwardtia* 4(2): 146. 1957) (holotype FI, isotype K!).

D. elliptica Ridl., *J. Fed. Mal. St. Mus.* 10: 145. 1920 & *Fl. Mal. Pen.* 2: 213. 1923; Sleumer, *Reinwardtia* 4(2): 145. 1957; *Blumea* 11: 7. 1961; 12: 121. 1963 & *Fl. Males.* 6(5): 723, fig. 77 g. 1967. Type: Malaysia, Perak, G. Batu Putin, 1035 m, 21 Jun. 1909, *Wray 470* (lectotype K!, selected by Sleumer, 1957; isoelectotype SING). Fig. 1. A-B.

Epiphytic or terrestrial shrub up to 1 m high; branches slender with densely brown setose hairs and puberulose. *Leaves* spiral, elliptic or ovate, 1.2-2 by 0.8-1.3 cm, apex

obtuse or short apiculate, margin slightly crenate, base broadly cuneate to rounded; coriaceous, glabrous above, sparsely setose beneath; 3-nerved; midrib grooved above, slightly prominent beneath; petiole 1.5-2 mm long, densely setose; stipule-like axillary perulae subulate, 1-2 mm long, distinct on young branches. *Flowers* solitary, rarely 2-flowered, in axillary leaves; pedicel *ca.* 2 mm long, (sub-) glabrous, articulate to ovary, at top with 2 broadly ovate bracteoles, up to 1 mm long, rounded, sparsely ciliate. *Calyx* 2-3 mm long; 5-lobed, broadly triangulate, *ca.* 1.5-2 by 2-2.5 mm, apex obtuse to subacute, glabrous with fine cilia. *Corolla* campanulate, white or greenish, glabrous, 5-7 by 4-5 mm; corolla lobes broadly triangular, 1.5-2 by 2.5 mm, apex obtuse, recurved. *Stamens* 10; filaments 2.5-3 mm long, flattened, glabrous; anther 0.9-1 mm long, granulose, base sagittate; tubule 6-8 mm long, opening by elongate apical pore. *Style* 4-4.5 mm long, glabrous; stigma truncate. *Ovary* globose, 2.5 mm in diam., glabrous, 5-loculed, with many ovules. *Fruits* not seen.

Thailand.—PENINSULAR: Nakhon Si Thammarat (Khao Luang); Yala (Betong).

Distribution.— Malay Peninsula, Sumatra and Borneo.

Ecology.— In lower montane forest or moss forest, alt. 800-1,800 m.

Phenology.— Flowering July-August.

Vernacular.— Khai mot ree (ไข่มดรี), Khai mot lek (ไข่มดเล็ก).

Specimens examined.— *A.F.G. Kerr* 7585 (K), 13249 (K); *S. Watthana*, *P. Suksathan* & *S. Indhamusika* 423 (QBG).

Notes.— Sleumer (1957) treated *D. elliptica* Ridl. as a distinct species by using the stipule-like perulae and included *D. cordifolia* Ridl. as its synonym. Judging from available herbarium specimens of this treatment, its perulae presenting is variable. Type specimen of *D. cordifolia* Ridl. (Ridley 16238 K!) has two branches. I have some doubt that they may come from different plants. Thus, it is excluded from this species.

2. *Diplycosia epiphytica* H.R. Fletcher, Bull. Misc. Inform., Kew. 1936: 40. 1936 & in Fl. Siam. En. 2: 315. 1938; Sleumer, Reinwardtia 4(2): 133. 1957; Dansk Bot. Ark. 27(1): 89. 1969. Type: Thailand: Surat Thani, Khao Nawng, *ca.* 1,100-1,200 m, evergreen forest, 10 Aug. 1927, *A.F.G. Kerr* 13272 (holotype E!; isotypes K, BK!, fragment L!). Fig. 1. C-D.

Epiphytic shrub, young branches with densely brown setose hairs, up to 6 mm long, becoming glabrous and subterete. *Leaves* spiral, ovate, 4-8.5 by 2-3.7 cm; apex long acuminate, base rounded, margin entire, revolute; coriaceous; midrib grooved above, prominent beneath, with 3-5 (sub-) palmate veins, lax punctuate beneath; petiole 3-7 mm long, with setose hairs. *Flowers* 1-3, axillary; pedicels dense patent-subglandular-setose, 5-7 mm long; basal bracts ovate-acute, *ca.* 1.5 mm long; bracteoles ovate, subacute, dorsally glabrous or short-setose at base only, laxly short glandular-fimbriate and ciliate, *ca.* 1.8 mm long. *Calyx* thick, 3-3.5 mm long, glabrous, 5-lobed to 2/3 of its length; lobes triangular, 2.5 mm wide, imbricate, margins longish-glandular-subsetulose in the lower part, shorter towards the apex. *Corolla*

urceolate, greenish, glabrous, 5-6 mm long; lobes obtuse *ca.* 2 mm long. *Stamens* 10; filaments linear, dilate towards the base 1.5-1.7 mm long; anthers ovate-oblong, 2-2.5 mm long including long tubules, abruptly attenuate into the tubules, 0.6-1 mm long. *Ovary* hairy on top; style glabrous, 2.5-4 mm long. *Fruits* surrounded by fleshy calyx, globose *ca.* 0.5 cm in diam., dull blue to dark purple; seeds oblique oblong-triangular, *ca.* 1 mm long.

Thailand.— PENINSULAR: Nakhon Si Thammarat (Khao Luang); Surat Thani (Khao Nawng).

Distribution.— Endemic.

Ecology.— In evergreen forest; alt. 1,350-1,800 m.

Phenology.— Flowering August; fruiting January-March.

Vernacular.— Khai mot bai hang (ไข่มดใบหาง).

Specimens examined.— *B. Hansen & T. Smitinand* 12037 (BKF); *C. Niyomdham et al.* 2302 (BKF); *T. Smitinand* 2327 (BKF); *M. Tagawa, K. Iwatsuki & N. Fukuoka* T-4883 (BKF); *S. Watthana, P. Suksathan & S. Indhamusika* 422 (E, QBG).

3. *Diplycosia heterophylla* Blume, Bijdr. 858. 1826; DC., Prodr. 7: 591. 1839; Sleumer, Reinwardtia 4(2): 155. 1957 & Fl. Males. 6(5): 738. 1967.

var. ***latifolia*** (Blume) Sleumer, Reinwardtia 4(2): 156. 1957; Blumea 12: 123. 1963 & Fl. Males. 6(5): 738; fig. 79. 1967.

D. latifolia Blume, Bijdr. 858. 1826; Ridl., J. Fed. Mal. St. Mus. 8: 57. 1917 & Fl. Mal. Pen. 2: 214. 1923; H.R. Fletcher in Craib, Fl. Siam. En. 2: 315. 1938. Type:

without locality *Herb. Blume* (holotype L). Fig. 1 E.

Epiphyte, shrub or small tree up to 7 m tall; branches angular, glabrous. *Leaves* elliptic to oblong-elliptic, 7-16 by 3-8 cm, thickly coriaceous, apex obtuse to acute, base acute to obtuse, coriaceous, glabrous on both surfaces, laxly punctulate beneath, margin entire and slightly revolute; midrib impressed above, prominent beneath; veins 6-9 on each side, the lower ones extend to near the apex; petiole grooved above, 3-7 by 1-1.5 mm. *Flowers* 4-15 per fascicle from foliate or defoliate axils, light green; pedicels rather slender, 4-7 mm long, hairy to subglabrous, basal bracts broadly-triangular, obtuse, fimbriate; bracteoles *ca.* 1.5 mm long, suborbicular-ovate, obtuse, keeled, with short hairs on the keel, glandular-fimbriate. *Calyx* glabrous, 2.5-3 mm long; lobes ovate, 1.5-2 mm long, obtuse, densely glandular-fimbriate. *Corolla* narrowly-campanulate, glabrous, 4-6 by 2-3.5 mm; lobes recurved, 1.3-1.5 mm long. *Filaments* linear, curved, glabrous, 1.8-2 mm long; anther ovate-oblong, 1.3-2 mm long, granular, rather short tubules included. *Ovary* 5-loculed, glabrous; style 4-5 mm long. *Fruits* 4-5 mm in diam., greenish-white at first, then dull lead-coloured, finally purplish blue or blackish and shining.

Thailand.— PENINSULAR: Yala (Betong).

Distribution.— Malay Peninsula, Sumatra, Java, Borneo, Philippines.

Ecology.— In evergreen forest, alt. *ca.* 800 m.

Phenology.— Flowering in May-August.

Vernacular.— Khai mot hin (ไผ่มดหิน).

Specimens examined.— *A.F.G. Kerr* 7090 (K); *C. Niyomdham* 6174 (BKF, K).

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FIGURE 1. A-B: *Diplycosia microphylla* Becc.; C-D. *D. epiphytica* H.R. Fletcher; E. *D. heterophylla* Blume var. *latifolia* (Blume) Sleumer.