

TWO ADDITIONAL ASIATIC SPECIES OF GLYPTOPETALUM (CELASTRACEAE)

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The flowering specimens of *Glyptopetalum* are very difficult to separate from those of *Euonymus* except by examining the number of ovules in each cell of the ovary. The ovules are mostly 2, rarely 3—12, per cell in *Euonymus* and there is only one in *Glyptopetalum*. However, the genus *Glyptopetalum* can be easily distinguished from *Euonymus*, or recognized, by the characteristic persistent columella of the fruit and the branched raphe of the seed (cf. also Fl. Mal. I, 5, 1963, 256 and fig. 7h).

In preparing the *Celastraceae* for the Flora Malesiana, two additional extra-Malaysian species of *Glyptopetalum* have been found: a new one from Thailand and a new combination for the flora of China. The range of distribution of this genus is now extending to southwestern China.

I am very grateful to the directors and keepers of the following institutions for the material on loan for this study: Royal Forest Department, Bangkok (BKF), Herbarium Bogoriense, Bogor (BO), Botanical Museum and Herbarium, Copenhagen (C), Royal Botanic Garden, Edinburgh (E), Royal Botanic Gardens, Kew (K), Rijksherbarium, Leiden (L), and Muséum National d'Histoire Naturelle, Paris (P).

1. *Glyptopetalum subcordatum* Ding Hou, *sp. nov.*—Fig. 1 j—p.

Frutex scandens ramulis glabris teretibus raro quadrangulatis. *Folia* sessilia vel subsessilia, subcoriacea, ovata vel ovato-lanceolata, $10\frac{1}{2}$ —17 cm longa et 5 — $8\frac{1}{2}$ cm lata, apice acuminata, basi subcordata, margine leviter revoluta, crenulata, nervis 8—12. *Cymae* axillares, solitariae, breves, c. 1 cm longae; pedunculus $\frac{1}{2}$ —1 cm longus; pedicelli c. 2 mm longi. *Calyx* carnosus, lobis semiorbicularis, 2 — $2\frac{1}{2}$ mm longis, $2\frac{1}{2}$ —3 mm latis, margine scariosis, rubro-brunneis. *Petala* suborbicularia, 4 — $4\frac{1}{2}$ mm longa, 4 —5 mm lata, venosa. *Discus* quadrangularis vel 4-lubulatus. *Stamina* subsessilia. Stylus inconspicuus. *Capsula* subglobosa, c. $1\frac{1}{2}$ cm diam. Semina subglobosa, c. 8 mm diam.

Scandent shrub $1\frac{1}{2}$ m tall. Branchlets greenish, terete, rarely 4-angular. *Leaves* spreading at an angle almost 90° to the branchlets, sessile or subsessile, subcoriaceous, ovate to ovate-oblong, $10\frac{1}{2}$ —17 by 5 — $8\frac{1}{2}$ cm; apex acuminate; base subcordate; margins slightly revolute, crenulate; nerves 8—12 on each side of the midrib, spreading. *Cymes* 1(—2)-branched, in the axils of bracts or leaves, very short, c. 1 cm long, on fruiting specimens $1\frac{1}{2}$ —3 cm long; peduncles $\frac{1}{2}$ —1 cm; pedicels 2 mm; bracts lanceolate, c. $1\frac{1}{2}$ mm long. *Flowers* greenish white. *Calyx* fleshy, lobes semiorbicular, 2 — $2\frac{1}{2}$ by $2\frac{1}{2}$ —3 mm, the margin scarious, reddish brown, slightly erose. *Petals* rather fleshy, suborbicular, 4 — $4\frac{1}{2}$ by 4 —5 mm, slightly erose, with distinct palmate-venation. *Disk* 4-angular or -lobed, the central part slightly concave. *Stamens* subsessile, c. $\frac{3}{4}$ mm long; anthers dehiscing transversely at the top. Free part of the *pistil* conical, c. $\frac{1}{3}$ mm long; style and stigma obscure. *Fruits* green, subglobose, c. $1\frac{1}{2}$ cm in diam., smooth on the outer surface, usually only one seed developed. Seeds subglobose, c. 8 mm in diam.

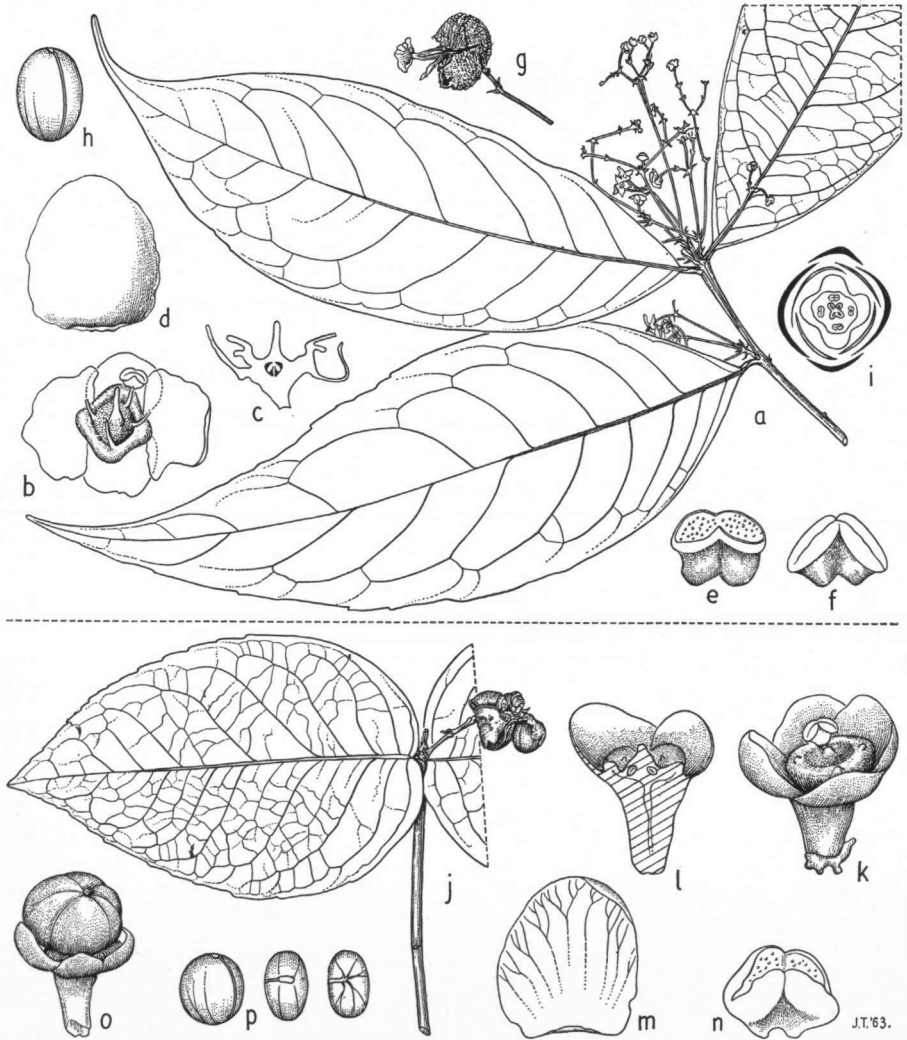


Fig. 1. *Glyptopetalum feddei* (Lévl.) Ding Hou — a. Habit, $\times \frac{1}{2}$; b. flower with petals removed, $\times 5$; c. ditto in longitudinal section, $\times 5$; d. petal, $\times 5$; e. dehiscent anther, $\times 15$; f. young anther, $\times 15$; g. dehiscent fruit showing the persistent columella, $\times \frac{1}{2}$; h. seed, $\times 1$; i. floral diagram. — *G. subcordatum* Ding Hou — j. Habit, $\times \frac{1}{2}$; k. young flower with petals removed, $\times 5$; l. longitudinal section of a mature flower, $\times 5$; m. petal, $\times 5$; n. anther, $\times 15$; o. young fruit, $\times 2\frac{1}{2}$; p. seed: lateral, apical and basal views showing the branched raphe, $\times 1$ (a—f & i Esquirol 4007, g—h Cavalerie 3353, j & p Kai Larsen 9065, k—o Kostermans 1376).

THAILAND. Kin Sayok, about 120 km northwest of Kanburi, mixed forest, alt. 100—150 m, *Kostermans 1376* (type, L; dupl. in BO); Sai Yok, dry limestone hill, alt. 250 m, *Kai Larsen 9055* (C, L); Huey Menam Noi, on limestone outcrops dominant, alt. 200 m, *Kai Larsen 9065* (C).

There is a specimen which was collected by Kostermans at Kin Sayok, Thailand, in 1946, bearing a few flowers and very young fruits. It belongs to *Glyptopetalum*. Based on literature, it is quite closely related to *Euonymus sootepensis* Craib (Kew Bull. 1912, 148). Recently while determining the collections of *Celastraceae* from Thailand made by the Danish Expedition, I was so glad to see two additional specimens as cited above, similar to that of Kostermans, bearing mature fruits and seeds.

I have the type and two other specimens, all in flowers, of *Euonymus sootepensis* on loan from the Kew Herbarium: Thailand. Chiengmai, *Kerr 1835* (type), *Sørensen, Kai Larsen & Hansen 3079* (also in C), and Mûang Kawng, *Kerr 5522*. This species is a true *Euonymus*. In addition to the two pendulous ovules per cell, this species can be distinguished from *G. subcordatum* by the leaves which are chartaceous, broad-ovate or -elliptic, elliptic, or rarely suborbicular ($3-8\frac{1}{2}$ by $2\frac{1}{3}-5$ cm) and by the stamens being inserted on the margin of the disk.

G. subcordatum can be easily distinguished from other species of *Glyptopetalum* even just by the characteristic leaves which are sessile or subsessile, coriaceous, ovate to ovate-oblong and subcordate at the base.

2. *Glyptopetalum feddei* (Lévl.) Ding Hou, comb. nov.—*Euonymus feddei* Lévl. in Fedde, Rep. 13 (1914) 260; Loes. Ber. Deut. Bot. Ges. 32 (1914) 539; Rehd. J. Arn. Arb. 14 (1933) 245; Blakelock, Kew Bull. (1951) 256.—Fig. 1 a—i.

Branchlets terete. *Leaves* chartaceous, elliptic- or ovate-oblong, rarely elliptic-lanceolate, 12—22 by 4—7 $\frac{3}{4}$ cm; base cuneate, rarely obtuse; apex acuminate; margins slightly revolute, crenulate; nerves 8—10 on each side of the midrib, obliquely curving upward, elevated on both surfaces, sometimes depressed above; petiole c. $\frac{1}{2}$ cm. *Cymes* axillary, dichotomously 1—3-branched, $2\frac{1}{2}-7\frac{1}{2}$ cm long, sometimes in the axils of small, linear, lanceolate, reduced leaves or bracts (2—7 mm long) on a short young shoot and the whole shoot appeared paniculiform; peduncles $1\frac{3}{4}-4\frac{3}{4}$ cm; pedicels 4—7 mm; bracts triangular, 1—1 $\frac{1}{2}$ by $\frac{1}{2}-\frac{3}{8}$ mm, acuminate, glanduliform on the margin. *Flowers* greenish. *Calyx* almost divided to the base, lobes reniform, the outer two c. $1\frac{1}{2}$ by 3 mm, the inner two c. $1\frac{3}{4}$ by $3\frac{1}{2}-3\frac{3}{4}$ mm, margin reddish brown when dry, entire, or slightly erose. *Petals* very broad-ovate or suborbiculate, 4 by 3—4 mm. *Disk* 4-angular or -lobed, the widest part $2\frac{1}{2}-3$ mm, dish-shaped, with a broad-board wider at the angle or lobe. *Stamens* c. $1\frac{1}{2}$ mm long, inserted just within the board opposite the angle or lobe; anthers transversely dehiscent at the top. Free part of the *pistil* narrowed into a terete, slender style c. 1 mm; stigma obscure. *Fruits* subglobose, c. $1\frac{1}{2}$ cm in diam., verrucose on the outer surface. Seeds broad-oblong, c. $1\frac{1}{4}$ by $\frac{3}{8}$ cm.

CHINA. Kweichow: Lofou, *Cavalerie 3353* (isotype, E), 3554 (P); river Tathang (?), *Esquirol 4007* (P).

During my visit to the Muséum National d'Histoire Naturelle, Paris, last October, I saw two unnamed, very well preserved Chinese specimens of *Celastraceae* as cited above. They evidently belong to the same species of *Glyptopetalum*. In the past, A. A. H. Léveillé described so many new genera and species, based on the collections of Esquirol, Cavalerie and other French missionaries, from Kweichow, China. Unfortunately I found none of these two specimens being cited in the *Celastraceae* in Rehder's paper "Notes on the ligneous plants described by Léveillé from eastern Asia" (J. Arn. Arb. 14, 1933, 242—252).

After studying literature and examining descriptions of *Euonymus* species of south-western China especially those described by L veill , the two collections in question match rather well with the short description of *E. feddei* L vl. and those type of which was also collected by the same person at similar locality as one of the two specimens.

I have the type of *Euonymus feddei* on loan from the Royal Botanic Garden, Edinburgh. According to a letter of Dr H. R. Fletcher addressed to Prof. van Steenis stated that "the holotype was definitely in the L veill  Herbarium at one time but cannot be found". I have specimens of the isotype both from the general herbarium and the L veill  herbarium. The specimen in L veill  herbarium consists of young flowering branchlets in a folder not mounted, without field note, containing the original description of the species in French. After studying the isotype, I have concluded that *E. feddei* L vl. is actually a distinct species of *Glyptopetalum*, which is a second record of the genus to the flora of China (cf. Fl. Mal. I, 5, 1962, 256), and the two unnamed specimens mentioned above belong to it. As the original description is very concise based on a collection in very young flowers, with both flowering and fruiting material available, I have drawn up a more detailed one.

The present species is closely allied to *G. sclerocarpum* Kurz (J. Asiat. Soc. Beng. 41, ii, 1872, 299) by the verrucose fruits but can be easily distinguished from it at first glance by the short pedicels (4—7 mm against 15—30 mm), by the leaves which are chartaceous and usually cuneate at the base (against coriaceous and round or obtuse at the base), and by the smaller fruits (1½ cm against 2½ cm in diam.).

For *G. sclerocarpum*, I have examined the following specimens: Burma: Pegu, Kurz 1923 (type, K); Thailand: Me Ta, Kerr 2569 (K), Krabin, Kerr 9811 (K), Pr , Vanpruk 356 (BKF) and locality unknown, Vinit 1615 (BKF).

Loesener (*l.c.*) stated that this species is related to *Euonymus attenuatus* Wall. and *E. bullatus* Wall.; I have checked the collections of those two species in the Rijksherbarium, Leiden, and they are all true *Euonymus* (cf. also Blakelock in Kew Bull. 1951, 248 & 251).