

## Taxonomic Notes on Two Species of *Cleidiocarpon* (*Euphorbiaceae*)

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Detailed taxonomic studies on two species of *Cleidiocarpon* Airy Shaw (*Euphorbiaceae*), viz., *C. cavaleriei* (H. Lév.) Airy Shaw and *C. laurinum* Airy Shaw are presented. Lectotypification is made for *C. cavaleriei* and *C. laurinum*.

**Key words:** *Cleidion bishnui*, *Cleidiocarpon cavaleriei*, *Cleidiocarpon laurinum*, *Euphorbiaceae*, lectotypification, *Sinopimelodendron kwangsiense*, taxonomy.

Airy Shaw (1965) erected the genus *Cleidiocarpon* based on two species; *Cleidiocarpon cavaleriei* (H. Lév.) Airy Shaw, a new combination based on Lévillé's species *Baccaurea cavaleriei* H. Lév. and *C. laurinum* Airy Shaw, a new species by him. The type material of *C. cavaleriei* (J. Cavalerie 3299) was from China and that of *C. laurinum* (Lace 5343) from Myanmar. While describing *C. cavaleriei* Airy Shaw (1965) gave an incomplete description because many of the features were not known to him. Further, he had a doubt whether *C. laurinum* and *C. cavaleriei* are really distinct species because of apparently similar vegetative characters. Since types involved concerning these names were poor and the known distribution of the species were far apart, he left them as separate species.

The present authors searched for fruiting specimen of *C. cavaleriei*, which was described on the flowering specimen, for comparison with that of *C. laurinum* whose type material consists of one gathering of four sheets in fruit (K 247098, image!, K 247099, image!, E 181670, image! and CAL 7278!). The present

authors search was in fact further prompted by one publication of *Cleidion bishnui* Chakrab. & M. Gangop. by Chakrabarty and Gangopadhyay (1988) based on CAL 7278 (!). In the course of enquiry, it was found that there is a new genus and a species described from Kwangsi, China, namely, *Sinopimelodendron kwangsiense* Tsiang (Tsiang 1973).

Tsiang (1973) gave an excellent morphological description and a very detailed illustration of *Sinopimelodendron kwangsiense*, except for his mistake in describing the anthers and the ovary as 2-celled and as 1-celled, respectively. Airy Shaw (1978) synonymised *S. kwangsiense* under *C. cavaleriei* having access to good material combined with the detailed description presented by Tsiang (1973), and his personal correspondences with Tsiang regarding the errors made in the original description and the corrections thereof (the anthers are 4-locellate and the ovary bilocular as in *Cleidiocarpon*). The elaborate circumscription (as given for *Sinopimelodendron*) was later followed in Flora of China for *Cleidiocarpon* (Qiu and Gilbert 2008). Thus the exact circumscription

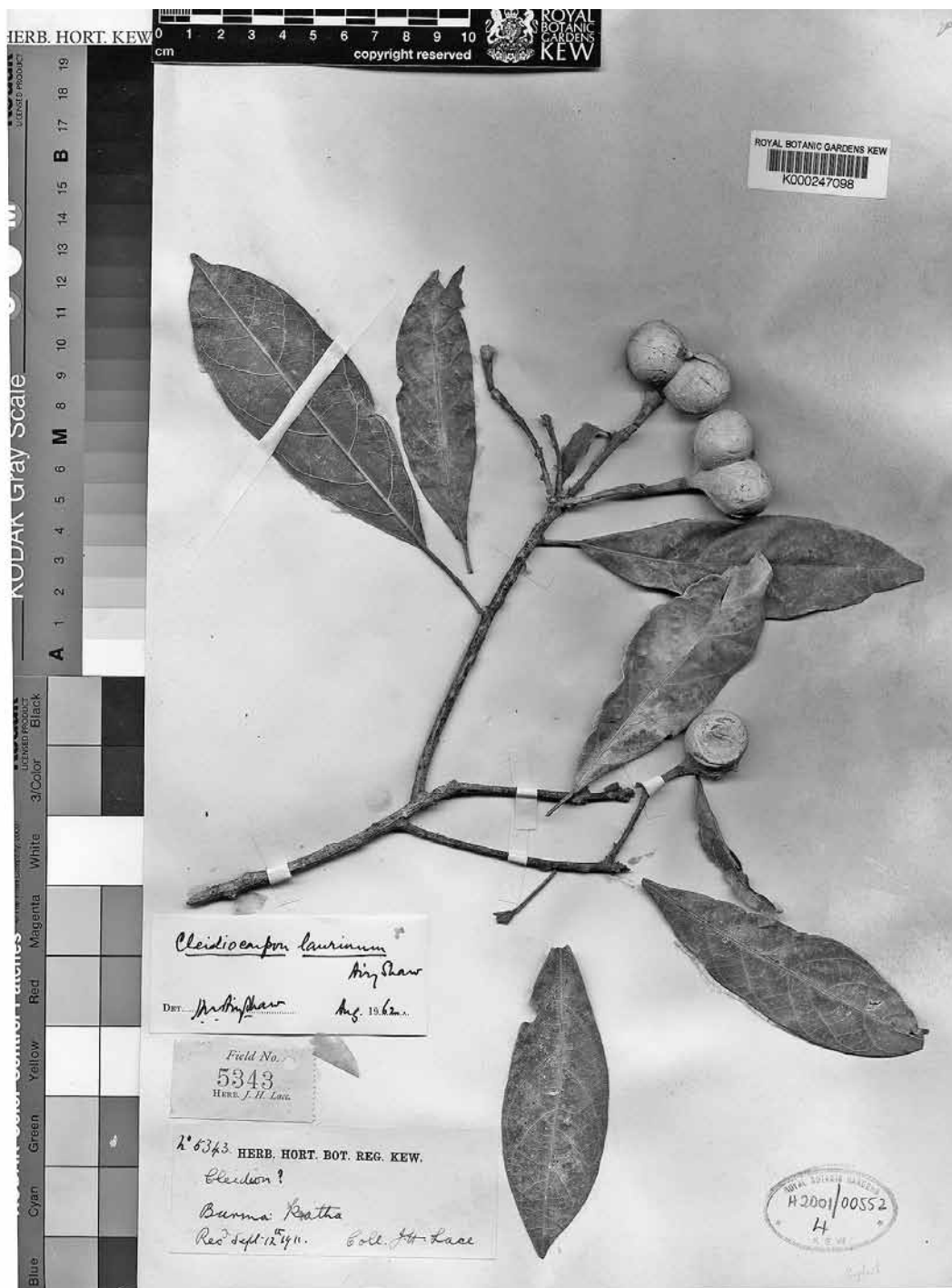


Fig. 1. Lectotype of *Celidocarpon laurinum* Airy Shaw (K 247098).



Fig. 2. Holotype of *Sinopimelodendron kwangsiense* Tsiang (CANT 307).

of *Cleidiocarpon* has come from the publication of *Sinopimelodendron* (1973) when the authors of both the genera convincingly realized that *Cleidiocarpon* and *Sinopimelodendron* are congeneric.

Once we had a full understanding of *C. cavaleriei*, the authors realized its distinction from *C. laurinum* with greater clarity. The presence of a caducous epicalyx and persistent calyx in the fruit make *C. cavaleriei* very distinctive from *C. laurinum*. Besides, in *C. cavaleriei*, usually one locule develops into fruit unlike in *C. laurinum* where both the locules more often give rise to very striking bilobed fruits as if two marbles tightly tied together in an elastic envelope. Surprisingly, Airy Shaw (1965) did not comment on *C. laurinum* or its generic affiliation, this being the type of *Cleidiocarpon* particularly with reference to ovaries which have relatively long connate styles and bifurcate stigmas. None of the herbaria in Myanmar provided any additional material for comments. As Welzen (2005) pointed out, this is one of the less known species and in Global Forest Resources Assessment (Anonymous 2005), under country report from Myanmar, it was reported as endangered. The present authors attempted to get a flowering specimen/image from different herbaria in Myanmar and Thailand for better understanding and epitypification of *C. laurinum* but so far no herbarium specimen could be located. Therefore, the scope for epitypification of *C. laurinum* remains open for future workers till suitable flowering material is found.

*Cleidion bishnui* is to be treated as a superfluous name as it is based on the type of *C. laurinum* (Lace 5343, CAL 7278!). The outcome of the discussion may be set out formally as follows:

#### Key to *Cleidiocarpon laurinum* and *C. cavaleriei*

1. Calyx persistent; usually one of the two locules develops into fruit ..... *C. cavaleriei*

1. Calyx deciduous; usually both the locules develop into fruit ..... *C. laurinum*

#### Taxonomic treatment

1. *Cleidiocarpon laurinum* Airy Shaw in Kew Bull. **19**: 3131(1965) & **36**: 608 (1981) – Welzen in Chayamarit & Welzen (eds.), Fl. Thailand **8**(1): 164 (2005) – *Cleidion bishnui* Chakrab. & M. Gangop. in J. Econ. Taxon. Bot. **12**(2): 473 (1989), nom. superfl.

**Lectotype** (designated here): **BURMA (MYANMAR)**. Katha, Recd. (Received), 12 Sept. 1911, Lace 5343 (K 247098; Fig. 1); Lace 5343 (K 247099, E 181670–isolectotype).

Small trees, monoecious, up to 5 m tall. Stems terete, glabrous. Leaves simple, alternate, stipulate, elliptic-oblongate, 8–12 × 2–4 cm, cuneate at base, entire or irregularly dentate at margin, acuminate at apex, thinly coriaceous, glabrous at both surfaces; lateral nerves about 6 pairs; petioles up to 4 cm long. Inflorescences thyrsoid. Male flowers: ca. 2 mm across; sepals 3 or 4; petals absent; disc absent; stamens 5; filaments thick, anthers 4-celled, basifixed; pistillodes ca. 1 mm long. Female flowers: c. 3mm across; pedicels gradually enlarged and thickened in fruit; sepals as in male flowers, not persistent in fruit; petals absent; staminode ca. 1mm long; style up to 1cm long. Drupes usually bilobed, woody, coarsely reticulate; seeds one in each locule, subglobose.

Distribution: Myanmar and Thailand. In dry, evergreen tropical forests.

Specimens examined: All the cited and designated lectotype and isolectotypes.

2. *Cleidiocarpon cavaleriei* (H. Lév.) Airy Shaw in Kew Bull. **19**: 314 (1965) & **36**: 608 (1981); H. Qiu & M. G. Gilbert in C. Y. Wu & P. H. Raven, Fl. China **11**: 250 (2008) – *Baccaurea cavaleriei* H. Lév., Fl. Kouy-Tcheou 160 (1914–1915).

**Lectotype** (designated here): **CHINA**. Kweichow Prov., Lo Fou, April 1907, Cavalerie 3299 (E 51780, image!; Cavalerie 3299 (A

105613, image! –isolectotype).

*Sinopimelodendron kwangsiense* Tsiang in Acta Bot. Sinica **15**(1): 133.1973. Type: CHINA. Kwangsi Prov., Ning-Ming Hsien, Hsia-Shih, alt. 280 m, evergreen tree 25–30 m tall, 30–80 cm D.B.H., bark greyish-yellow, flowers monoecious, fruit reddish when mature, seeds with copious oil, edible, 1 Aug. 1963, Liu Pin-Lun 17936 (CANT 307–holotype, Fig. 2; PE 22677, 22678–isotypes, images!).

Medium- to large-sized trees, 10–30 m tall. Young branchlets stellate-pubescent, glabrescent. Leaves simple, alternate, elliptic, oblong-elliptic, or lanceolate, 6–22 × 1.5–6 cm, thinly coreaceous, cuneate at base, entire at margins, acuminate at apex; lateral nerves up to 12 pairs; petioles ca. 1–4 cm long, swollen at both ends. Inflorescences a panicle, gray pubescent. Male flowers: Calyx lobes 3 to 5; petals absent; stamens 3 to 5, anthers 4-celled; pistillode columnar, c. 1 mm long. Female flowers: epicalyx 5–8-lobed, lobes lanceolate, caducous; calyx lobes 5–8, 3–5 mm long, pubescent; ovary 2-locular,; style apically 3–5-lobed; stigma papillose. Fruits subglobose, usually one of the locules develops, 3–5 cm across, narrowed at base into a stipe, pubescent; seeds subglobose; testa bony, thick.

Distribution: China and Vietnam. In tropical forests.

Specimens examined: All the cited types (holo, iso, lecto and isolectotypes) under citation.

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M. K. Pathak, P. Venu : *Cleidiocarpon* 属 (トウダイグサ科) 2 種の分類学的ノート

*Cleidiocarpon* 属 (トウダイグサ科) の 2 種, *C. cavaleriei* (H. Lév.) Airy Shaw と *C. laurinum* Airy Shaw を分類学的に研究した。本研究では、この 2 種の

レクトタイプ選定を行うとともに、異名を整理し、2 種の検索表を付した。

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