Elatostema oppositum (Urticaceae), a New Species from Yunnan, China

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ABSTRACT. A new species of *Elatostema* J. R. Forst. & G. Forst. (Urticaceae), *E. oppositum* Q. Lin & Y. M. Shui, belonging to section *Weddelia* (H. Schroet.) W. T. Wang ser. *Stipulosa* W. T. Wang, is described and illustrated from Yunnan Province, China. The new species was found on limestone rocks at altitudes of 1700–1940 m and differs from the other species in series *Stipulosa* by its paired staminate inflorescences that are opposite one another at the stem nodes (staminate inflorescences are solitary in the other species of *Elatostema* ser. *Stipulosa*) and by its pistillate inflorescences in pairs at the leaf base or opposite one another at the stem nodes (pistillate inflorescences are solitary in the other species of this series). The new species is related to *E. nasutum* Hook. f., but can be distinguished by its stems that are longitudinally striate, the paired staminate inflorescences opposite one another at the stem nodes, the pistillate inflorescences in pairs or opposite one another at the stem nodes, and the staminate flowers that are 5-merous.

Key words: China, *Elatostema*, IUCN Red List, Urticaceae, Yunnan.

The genus *Elatostema* J. R. Forst. & G. Forst. (Urticaceae) consists of 300 to 350 species and is distributed throughout tropical and subtropical Africa, Asia, and Oceania. Eighty-two species are known to occur in Yunnan Province, China (Lin et al., 2003; Wei & Wang, 2009). The most recent infrageneric classification for Chinese taxa of *Elatostema* was proposed by Wang and Chen (1979) and Wang (1980, 1990), and included five sections (*Elatostema* sect. *Pellionioides* W. T. Wang, *Elatostema* sect. *Weddelia* (H. Schroet.) W. T. Wang, *Elatostema* sect. *Laevispermae* (Hatus.) T. Yamaz., *Elatostema* sect. *Elatostema*, and *Elatostema* sect. *Androsyce* Wedd.). *Elatostema* sect. *Weddelia* comprises 10 series, within which the new species described here is assigned to *Elatostema* ser. *Stipulosa* W. T. Wang.

The type locality for the new species is in Malipo County between latitude 23°7′N and longitude 104°41′E, and comprises a range with many limestone hills. Our fieldwork in southeastern Yunnan Province, in southwestern China, took place in April 1998, July 1999, and March and May 2002. This previously unknown species was collected on limestone rocks, and is herein described and illustrated as new.

Elatostema oppositum Q. Lin & Y. M. Shui, sp. nov. TYPE: China. Yunnan: Malipo Co., Zhongzai to Xiao-Ping-An village, 1700 m, 23 Mar. 2002, *Y. M. Shui, W. H. Chen, J. S. Sheng, S. D. Zhang & C. L. Fan 20287* (holotype, PE; isotype, KUN). Figure 1.

Species nova quae a ceteris speciebus *Elatostematis* seriei *Stipulosarum* W. T. Wang inflorescentiis masculinis oppositis atque femineis binis vel oppositis, a *E. nasuto* Hook. f. caulibus longitudinaliter striatis, stipulis brevioribus subulatis atque floribus staminatis pentameris differt.

Perennial herbs, monoecious or dioecious, 15–50 cm tall, glabrous or glabrescent; stems ascending, simple or branched, longitudinally striate. Leaves alternate; nanophylls absent; stipules 2, subulate, 5–7 mm, glabrous, without cystoliths, deciduous; petioles 0–2 mm; leaf blades obliquely narrowly lanceolate, obliquely elliptic-obovate, or obliquely elliptic, 2.5–17.5 × 1.2–6.3 cm, papyraceous or chartaceous, brown-black after drying, the 2 major basal lateral veins asymmetric, one arising above the other basal vein, cystoliths conspicuous, dense, random, rod-shaped, small, 0.1–0.15 mm; leaf blade bases asymmetric, broader side broadly cuneate or nearly rounded, narrower side attenuate, margins dentate, apex long acuminate. Staminate inflores-

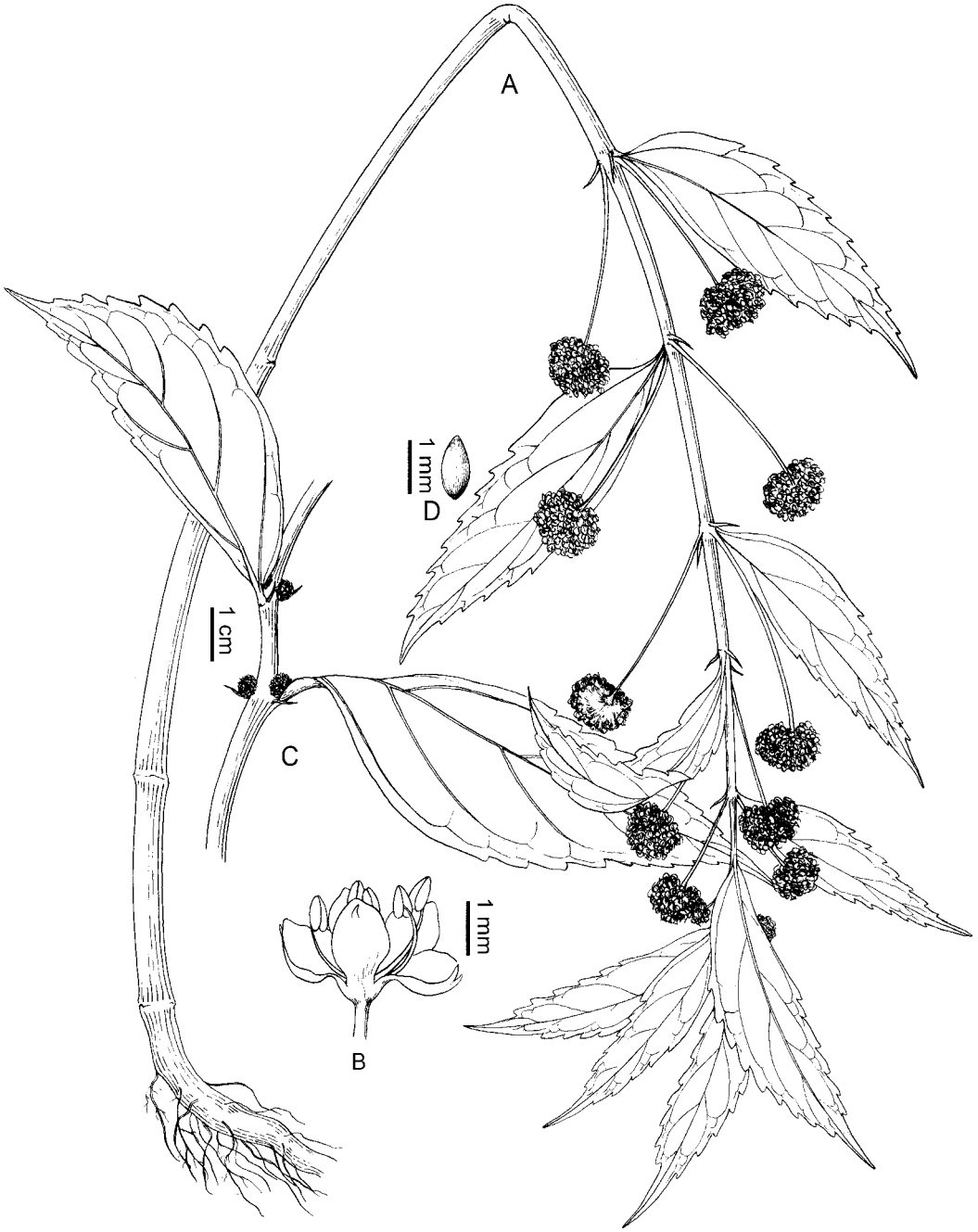

Figure 1. *Elatostema oppositum* Q. Lin & Y. M. Shui. —A. Staminate habit. —B. Staminate flower. —C. Portion of fruiting stem. —D. Achene. A, B drawn by Ai-Li Li from the holotype, *Y. M. Shui, W. H. Chen, J. S. Sheng, S. D. Zhang & C. L. Fan 20287* (PE); C, D from *Y. M. Shui, R. Z. Fang & W. H. Chen 21228* (PE).

cences opposite each other at the same stem node with the node either bearing a leaf or without a leaf, one staminate inflorescence opposes the leaf base, with the second one at the bract base, or both found at bract bases when the stem node is leafless, simple, 6–16 mm diam.; bracts linear or narrowly lanceolate, 5–10 mm, deciduous; peduncle 0.5–3.5 cm; receptacle 2.5–5 mm diam.; involucral bracts 10 to 12, in a single whorl, ovate, ca. 0.5 mm, persistent; bracteoles linear-spatulate, ca. 1 mm. Staminate flowers 5-

Table 1. Comparison of morphological characteristics of *Elatostema oppositum* and *E. nasutum*.

Characters	*E. oppositum*	*E. nasutum*
Stems	longitudinally striate	without striae
Stipules	subulate, 5–7 mm, glabrous, without cystoliths	narrowly ovate or linear, 9–18 mm, glabrous, without cystoliths
Leaf blade	obliquely narrowly lanceolate, obliquely elliptic-obovate, or obliquely elliptic, 2.5–17.5 × 1.2–6.3 cm, brown-black after drying	obliquely elliptic or elliptic-ovate, 3–9(−18) × 2–3.5(−6.5) cm, brown-black after drying
Staminate inflorescences	opposite	solitary
Pistillate inflorescences	opposite	solitary
Staminate flowers	5-merous	4-merous

merous, the perianth lobes elliptic, white, ca. 0.3 mm; stamens 5; pistil rudimentary. Pistillate inflorescences paired at a stem node, or opposed to one another at stem nodes bearing a single leaf, only one pistillate inflorescence at the leaf base, with the second one at the bract base, 4–5 mm diam.; bracts subulate or linear, 2–4 mm, deciduous; sessile; receptacle ca. 2 mm diam.; involucral bracts narrowly ovate, ca. 0.1 mm, persistent; bracteoles linear-lanceolate, very small. Achenes ellipsoidal, ca. 10-ribbed.

Distribution and habitat. *Elatostema oppositum* is only known from its type locality in southeastern Yunnan, southwestern China. This species was collected on limestone rocks at altitudes of 1700–1940 m.

IUCN Red List category. The new species seems to be very rare and restricted in its distribution, and approximately 30 populations were found during our fieldwork. *Elatostema oppositum* should be considered Critically Endangered (CR) according to IUCN Red List criteria (IUCN, 2001).

Phenology. Flowering was observed in *Elatostema oppositum* from March to May, with fruiting from May to July.

Discussion. *Elatostema oppositum* is assigned to *Elatostema* sect. *Weddelia* ser. *Stipulosa*, because it has the diagnostic characters for that series, which include herbaceous habit, 3-veined leaf blades with the two basal lateral veins asymmetric to one another, and dentate leaf margins. The staminate inflorescences are simple, involucrate, and long-pedunculate; the staminate receptacles are small. The pistillate inflorescences are multiflorous and sessile; the pistillate receptacles are also small. The fertile bracts are conspicuous, and the achenes are small and ribbed. Until now, series *Stipulosa* comprised 12 species in China (Wang, 1995; Lin et al., 2003). *Elatostema oppositum* differs from other species in this series in its staminate inflorescences that appear opposite or opposed to one another at a stem node (vs. the inflorescences solitary) and the pistillate inflorescences that are similarly paired or opposed to one another at stem nodes (vs. solitary). The new species is related to *E. nasutum* Hook. f. but can be distinguished by its longitudinally striate stems, both staminate and pistillate inflorescences opposite one another at stem nodes, in contrast to the alternate arrangement of leaf blades, and the 5-merous flowers. Additional differences between the new species and *E. nasutum* are given in Table 1.

The new species is distinguished by having opposite inflorescences that oppose one another at the stem nodes. This contrasts with other species in *Elatostema*, which have either solitary or paired inflorescences at the single leaf base at a stem node. The epithet *oppositum* refers to the two staminate inflorescences that oppose one another on opposite sides of the same stem node, whether or not the stem node bears a leaf. At this stem node, one staminate inflorescence is positioned at the leaf base and the second inflorescence lies opposite, across the node and positioned at the bract base when this node bears a leaf. When the node is leafless, the two staminate inflorescences arise from the bases of paired bracts and are opposed to one another across this stem node. The pistillate inflorescences appear similarly in opposing pairs at either leaf-bearing or leafless stem nodes. Staminate inflorescences are conspicuously pedunculate, which contrasts with the sessile appearance of pistillate inflorescences. The new species resembles species in *Pilea* Lindl. and *Lecanthus* Wedd. by the plants having such opposite inflorescences; however, the new taxon should be ascribed to *Elatostema* because it has more characters diagnostic for *Elatostema*, including alternate leaves and the absence of pistillate tepals. It can be observed, however, that the three genera *Pilea*, *Lecanthus*, and *Elatostema* are closely related, and it is reasonable to place them in the same tribe, Elatostemeae Gaudich.

Further studies on the new species are needed to investigate the systematic evolution of tribe Elatostemeae as well as the relationship among the different sections within *Elatostema*.

There are two types of breeding systems in *Elatostema oppositum*, monoecious and dioecious. Staminate inflorescences and pistillate inflorescences may be seen on separate staminate and pistillate branches, respectively. In monoecious plants, both staminate and pistillate inflorescences can be found together on the same stem axis, with the staminate inflorescences on the lower branches and the pistillate inflorescences above. The evolutionary trend in the breeding system of the genus *Elatostema* may therefore be characterized as the monoecious habit giving rise to dioecy. For monoecious plants, staminate and pistillate inflorescences may appear on the same branch axis, which may evolve into staminate and pistillate inflorescences segregated to different branches.

Paratypes. CHINA. **Yunnan:** Malipo Co., 1700 m, 8 July 1999, *C. I. Peng, K. F. Chung & Y. M. Shui 17479* (HAST, KUN); 1750 m, 21 Apr. 1998, *H. N. Qin, Y. Z. Wang, H. Peng & Y. F. Deng 3068* (IBSC, KUN, PE [2]), *3100* (IBSC, KUN, MO, PE [2]); 1710 m, 22 Mar. 2002, *Y. M. Shui, W. H. Chen, J. S. Sheng, S. D. Zhang & C. L. Fan 20042* (KUN), *20096* (KUN); 1940 m, 22 Mar. 2002, *Y. M. Shui, W. H. Chen, J. S. Sheng, S. D. Zhang & C. L. Fan 20137* (KUN); 1700 m, 23 Mar. 2002, *Y. M. Shui, W. H. Chen, J. S. Sheng, S. D. Zhang & C. L. Fan 20298* (KUN), *20299* (KUN), *20301* (KUN), *20361* (KUN); 1600 m, 14 May 2002, *Y. M. Shui, R. Z. Fang & W. H. Chen 21228* (PE), *21283* (KUN).

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