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Centratherum Cass., a newly naturalized genus of family Asteraceae from mainland of Southeast Asia

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Abstract: *Centratherum* Cass., a newly naturalized genus of the family Asteraceae from Southeast Asia, was recorded in North Thailand and Southwest China. *C. punctatum* Cass. subsp. *fruticosum* (S. Vidal) K. Kirkman ex Shih H. Chen, M. J. Wu & S. M. Li, the only one representative subspecies of this genus from mainland of Southeast Asia, is described and illustrated based on the specimens. *C. punctatum* subsp. *fruticosum* can be distinguished from the other taxa of this genus by its leaf blade rhombic to elliptic, leaf margins irregularly serrate, leaf apex broadly acute, and phyllaries indurate at base and not awned. Its distribution map is provided and the possible dispersal pathway is discussed.

Key words: *Centratherum* Cass., Asteraceae, Vernoniaeae, naturalized genus, mainland of Southeast Asia, nomenclature

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苹果蓟属, 东南亚大陆菊科一新归化属

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摘要: 该文报道了在泰国北部和中国西南部的菊科一个新归化属——苹果蓟属(*Centratherum* Cass.)。依据所采集的标本, 详细描述了该属在东南亚大陆的唯一代表亚种苹果蓟 [*Centratherum punctatum* Cass. subsp. *fruticosum* (S. Vidal) K. Kirkman ex Shih H. Chen, M. J. Wu & S. M. Li], 并配以插图。苹果蓟与其所在属的其他种的区别在于该亚种叶片菱形至椭圆形, 叶缘具不规则锯齿, 先端微尖, 总苞片基部硬化, 先端无芒。文中还提供了苹果蓟的分布图, 并讨论了其可能的传播途径。

关键词: 苹果蓟属, 菊科, 斑鸠菊族, 归化属, 东南亚大陆, 命名法

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In a field trip to Thailand in May 2014, we collected an unknown taxon of the tribe Vernonieae of Asteraceae. Similar specimens were also collected in an expedition to Yunnan, China in April 2017. We identified these specimens as *Centratherum punctatum* Cass. subsp. *fruticosum* (S. Vidal) K. Kirkman ex Shih H. Chen, M. J. Wu & S. M. Li, a genus and a subspecies not previously recorded in the mainland of Southeast Asia. *Centratherum* Cass. but a tropical genus distributed in tropical America, Australia and Philippines (Kirkman, 1981). *C. punctatum* subsp. *fruticosum* is native to Philippines and can be distinguished from the other taxa of this genus by its leaf blade rhombic to elliptic, leaf margins irregularly serrate, leaf apex broadly acute, and phyllaries indurate at base and not awned (Kirkman, 1981; Chen et al., 1999).

Based on the specimens collected during the flowering phase, we provided the description as below.

Centratherum punctatum* Cass. subsp. *fruticosum (S. Vidal) K. Kirkman ex Shih H. Chen, M. J. Wu & S. M. Li in *Taiwania* 44(2): 300. 1999 (Figs. 2–4).

≡ *Centratherum fruticosum* S. Vidal, *Rev. Pl. Vasc. Filip.* 159. 1886; Elmer in *Leafl. Philip. Bot.* 1: 88. 1906.

Type: —PHILIPPINES. Distr. Lepanto (Mt. Province), 1876, *S. Vidal* 1502 (syntypes: A photo! [No. A00004641], L photo! [No. L.3034111], MA photo! [No. MA728008]).

= *Centratherum punctatum* Cass. subsp. *fruticosum* (Elmer) K. Kirkman in *Rhodora* 83: 20. 1981, nom. inval.

Type: —PHILIPPINES. Prov. Batangas, Luzon, 1841, *H. Cuming* 1556 (lectotype (designated by Kirkman, 1981): G photo! [No. G00223244]; isolectotypes: E photo! [No. E00417342], K photo! [No. K000796695], LE photo! [No. LE00017869, LE00017870]).

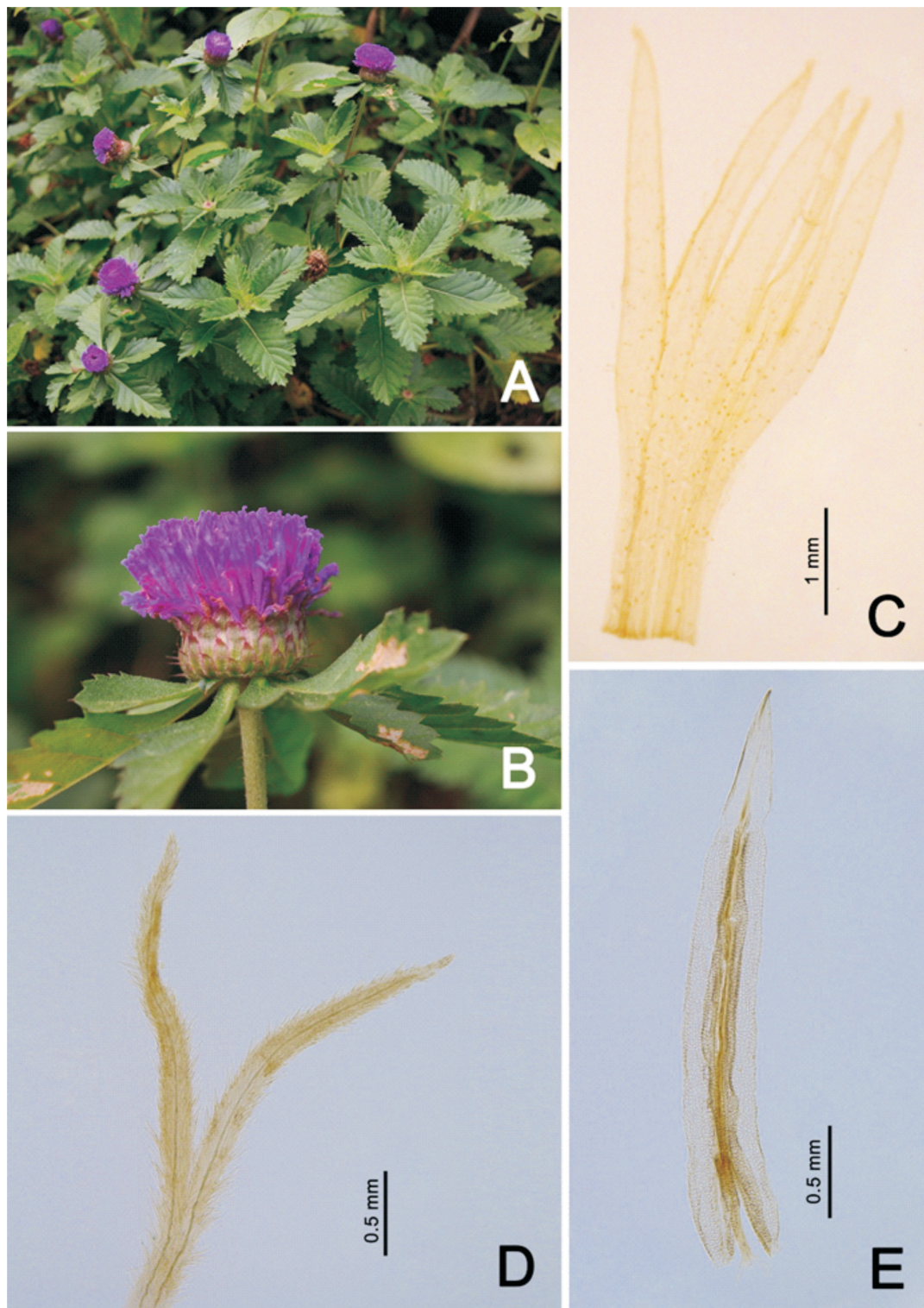
Perennial herbs or subshrubs, up to 1–1.4 m tall, branched (Fig. 1: A). Stem woody glabrous at base, young shoot hirsute, ridged. Leaves crowded, short in-

ternodes often appear fascicled, leaf blade elliptic-ovate to rhombic, 1–8.3 × 0.5–3.9 cm, broadly acute at apex, attenuate to truncate at base, margin irregularly crenate-serrate, uniseriate and T-shaped trichomes on both surfaces; petiole up to 2 cm, winged, indistinct in small blades. Capitula terminal or terminal on axillary branches, 2–2.8 cm in diam., 1.8–2 cm tall; peduncle 3–11 cm long, pubescent, receptacle naked; involucre campanulate to sub-globose, ca. 1 cm tall, base with leafy whorled bracts; phyllaries imbricate in 5–7 series, minutely pubescent, 3-veined, inner phyllaries linear-ob lanceolate to fiddle-shaped, 8 × 2.5–2.7 mm, apex mucronate to cuspidate, margin scarios, outer phyllaries triangular, 5–7 × 1–1.2 mm, apex spine or acuminate, base indurate (Fig. 1: B). Capitulum with many florets, hermaphrodite, regular. Corolla tubular, reddish-purple, 8–16 mm long, outer part with glandular hairs, lobes 5, linear-lanceolate (Fig. 1: C). Style white, style-branches filiform, flushed with purple and hispidulous (Fig. 1: D). Stamens 5, white; anthers linear, 3 × 0.5 mm, appendant lanceolate, base calcarate (Fig. 1: E). Achene obconic-cylindrical, ca. 2.5 × 1.5 mm, black, glabrous, with 10 ribs. Pappus of 6–10 bristles, deciduous, straw-colored, 2–3 × 0.2 mm.

Phenology: Flowering and fruiting throughout the years.

Specimens examined: THAILAND. Chiang Mai: Maesai to Nan, alt. 364 m, 99°51'32" E, 20°12'17" N, 14 May 2014, *Tiangang GAO & Guojin ZHANG* 5807 (PE). CHINA. Yunnan: Dehong Autonomous Prefecture, Ruili City, Wanding Town, Huihuan Village, alt. 935 m, 98°2'40" E, 24°7'4" N, 1 April 2017, *Jinpu WEI et al.* RL0832 (HCNGB). (Fig. 2)

In Asia, *Centratherum punctatum* Cass. subsp. *fruticosum* (S. Vidal) K. Kirkman ex Shih H. Chen, M. J. Wu & S. M. Li was recorded in Taiwan (Chen et al., 1999) and West Bengal (Chowdhury & Das, 2012). But it has never been recorded in the mainland of Southeast Asia. Besides the present distribution sites



Note: A. Habit; B. Capitulum; C. Corolla; D. Style branches; E. Anther.

Fig. 1 *Centratherum punctatum* Cass. subsp. *fruticosum* (S. Vidal) K. Kirkman ex Shih H. Chen, M. J. Wu & S. M. Li

(Southwest China and North Thailand), it could also possibly be discovered in the nearby places (like My-

anmar) in the future. It may be dispersed to the continent of Southeast Asia by flower trade, as marketing

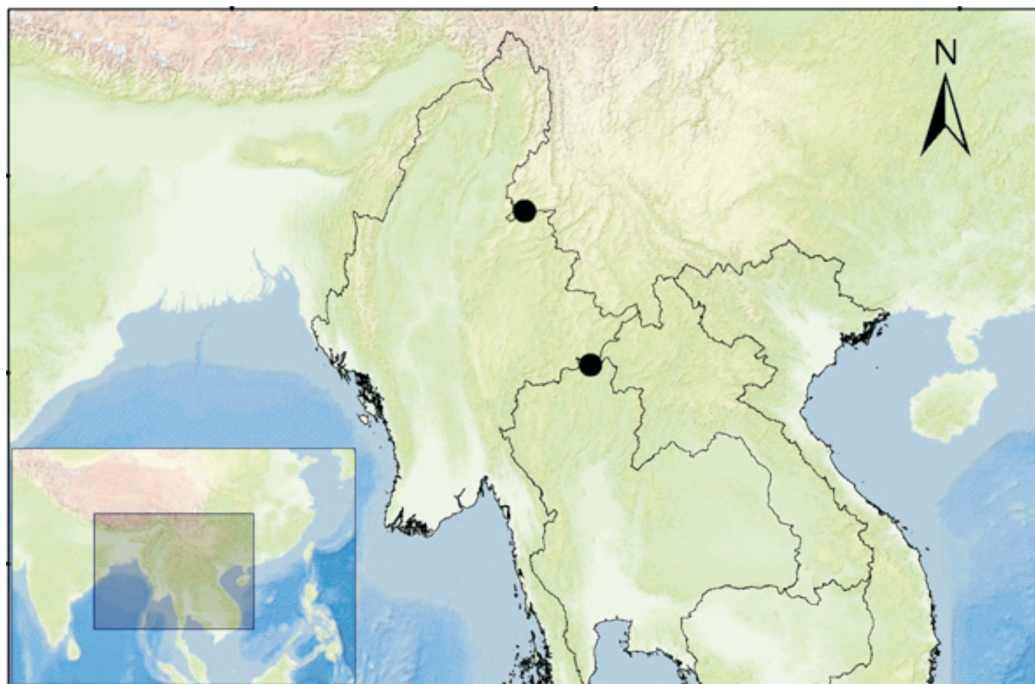


Fig. 2 Distribution of *Centratherum punctatum* Cass. subsp. *fruticosum* (S. Vidal) K. Kirkman ex Shih H. Chen, M. J. Wu & S. M. Li in mainland of Southeast Asia

information about it can be obtained in two big business websites of China (Jingdong, 2018; Taobao, 2018). Hitherto, *C. punctatum* subsp. *fruticosum* has not been reported as an invasive species. However, based on our field observations, it could produce an immense number of mature achenes (ca. 150) in one capitulum. In addition, because of the vegetational and climatic similarities between mainland of Southeast Asia and origin distribution (Zhang et al., 2017), close attention should be paid to its potential dispersal.

Note: *Centratherum fruticosum* was validly published by Vidal (1886) with indicating a single gathering (Vidal 1502). Quisumbing (1958, in sched.) labeled one specimen of this gathering (MA [No. MA728008]) as “type”, the other (A [No. A00004641]) as “isotype”, but no effective publication was found. According to Art 7.9 and 9.5 of ICN (McNeill et al., 2012), these three specimens from a single gathering should be treated as syntypes. In 1906, Elmer used the

name *C. fruticosum* S. Vidal by giving a full and direct reference, and cited the specimens *Cuming* 1556 and *Elmer* 5956. In 1981 Kirkman established the new combination *C. punctatum* Cass. subsp. *fruticosum* (Elmer) K. Kirkman based on the incorrect author and reference citation. In addition, Kirkman designated *Cuming* 1556 (G [No. G00223244]) as lectotype of *C. punctatum* Cass. subsp. *fruticosum* (Elmer) K. Kirkman and described it only in English. According to the Art 39.1, 41.5 and 41.8(d) of ICN (McNeill et al., 2012), as a new taxon name, *C. punctatum* subsp. *fruticosum* K. Kirkman was invalidly published because of no Latin description or diagnosis. Hence, the new combination *C. punctatum* subsp. *fruticosum* (Elmer) K. Kirkman was invalidly published because of the indirect reference. In 1999, Chen et al. cited Kirkman’s publication but clearly indicated the correct basionym *C. fruticosum* S. Vidal with a full and direct reference. Hence, *C. punctatum* Cass. subsp. *fruticosum* (S. Vidal) K. Kirkman ex Shih H. Chen, M. J. Wu &

S. M. Li was the valid name. The result is coincident with that of Chowdhury & Das (2012).

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