Klaseopsis and *Archiserratula*—two new genera segregated from *Serratula* (Compositae, Cardueae)

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Serratula chinensis and *S. forrestii*, both endemic to China, have been shown to be phylogenetically separated from all other species of *Serratula* and from each other in a previous molecular analysis, and are placed in the newly described genera *Klaseopsis* and *Archiserratula*, respectively. Full descriptions including illustrations are presented.

KEYWORDS: *Archiserratula*, Centaureinae, China, *Klaseopsis*, nomenclature, *Serratula*, taxonomy.

The genus *Serratula* L. in its traditional circumscription comprises approx. 50 species of perennial herbs distributed throughout the temperate and subtropical regions of Eurasia and North Africa. There is strong evidence from morphological, karyological and molecular data for the polyphyly of the genus, being composed of two independent phylogenetic lineages, i.e., *Serratula* s.s. and *Klasea* Cass. (Wagenitz & Hellwig, 1996; Martins & Hellwig, 2005a).

In a recent molecular phylogenetic analysis based on nuclear ribosomal ETS and ITS sequences (Martins & Hellwig, 2005b) it became evident that two species of *Serratula*, *S. chinensis* and *S. forrestii,* represent additional independent phylogenetic lineages without a close relationship to either *Serratula* or *Klasea*. *Serratula forrestii* was shown to be a product of a very early radiation within Centaureinae which retained most plesiomorphic character states within the subtribe. Within *Serratula*, this species has been placed in the monotypic section *Suffruticosae* (Iljin, 1928); for reasons given above this section is raised to generic level here. *Serratula chinensis* appeared to be allied with the genera of the "*Rhaponticum* group" (Hellwig, 2004), i.e., *Acroptilon*, *Leuzea*, *Oligochaeta*, etc. Within this group, the species is morphologically most similar to *Rhaponticum* (perennial life form, rather large capitula, innermost pappus elements of broader elements arranged in a ring, pappus elements brownish, stiff and fragile). However, species of the latter genus are usually monocephalous and the phyllaries usually have large scarious appendages whereas *S. chinensis* is usually branched and the phyllaries have a narrow scarious margin. Thus, a new genus to accomodate *S. chinensis* is proposed.

Archiserratula L. Martins, **nom. et stat. nov.** ≡ *Serratula* sect. *Suffruticosae* Iljin in Izv. Glavn. Bot. Sada S.S.S.R. 27: 92. 1928. – Typus nominis generici: *Archiserratula forrestii* (Iljin) L. Martins.

Archiserratula is placed in Centaureinae (Asteraceae, Cardueae), without close relationship to any of the other genera of the subtribe. Morphologically it is closest to *Serratula* and *Klasea*, differing from both by its long virgate monocephalous branches, resin ducts in the leaves appearing as a dark reticulum on the lower leaf surface, narrowly obconical to cylindrical receptacles, and by stigmatic branches deeply canaliculate. Additionally, it is distinguished from *Klasea* by its deeply bifurcate stigmas and from *Serratula* by its seeds having a basal hilum (Dittrich, 1968), and by homogamous bisexual capitula, and pappus elements pinnate at least in their distal part.

Archiserratula forrestii (Iljin) L. Martins, **comb. nov.** ≡ *Serratula forrestii* Iljin in Izv. Glavn. Bot. Sada S.S.S.R. 27: 91. 1928. – Lectotypus (hic designatus): China, Yunnan, Mekong Yangtze divide, 27°40' N, Aug. 1914, *G. Forrest 13146* (E!).

In the protologue, Iljin cited four specimens collected by G. Forrest, without designating a holotype or giving information about the herbaria where they are kept. The specimens at E have been seen by Iljin and are annotated with "*Serratula forrestii* Iljin sp. nov., 1927".

Icon.: Fig. 1; Anonymus (1975): Fig. 6717; Xuan (2003): Pl. 124, Fig. 5–7.

Plant perennial, herbaceous or suffrutescent, 70–150 cm tall; stem erect, long virgately branched, foliated throughout, glabrous or subglabrous. Leaves glabrous, subsessile, lanceolate to linear-lanceolate, base cuneate, margins denticulate, apex acute, with resin ducts along veins, venation thus appearing darker on lower surface, middle stem leaves 3–10 cm long and 0.5–2 cm wide, decreasing in size upward. Capitula several, solitary, ter-

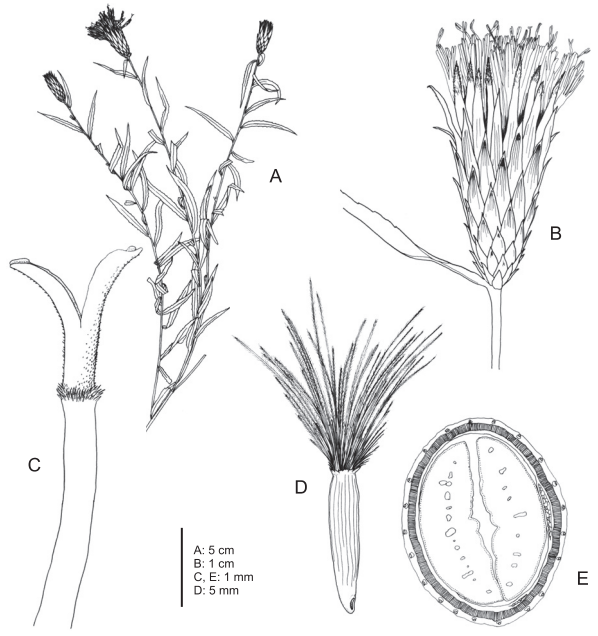

Fig. 1. ***Archiserratula forrestii*. A, habit; B, capitulum; C, style (distal part); D, achene; E, cross section of achene. A–C: *Forrest 16888* (BM); D, E: *Beu 159 (?)* (G).**

minal; clinanthium cylindrical to narrowly obconical; involucre cylindrical to narrowly obconical, 6–10 mm in diameter, 2.2–3 cm long; phyllaries in 7–8 series, imbricate, green, yellowish or slightly purple-tinged, outer and middle phyllaries ovate-triangular, triangular, or lanceolate, acute or apiculate, apically ± scabrid, inner phyllaries linear-lanceolate, apically densely pubescent with unicellular hairs. Florets bisexual; corolla pale purple, 19–22 mm long, corolla tube slender, 9–10 mm long, corolla lobes 5–6.5 mm long; anthers 8–9 mm long, basal anther appendages 1–1.5 mm long, apical anther appendages 1.8–2 mm long, their free part 0.8–0.9 mm long, narrowly triangular, apically bent inwards, filaments densely covered with 70–80 μm long papillae; style above ring of sweeping hairs ca. 2 mm long, stigma deeply bifurcate, stigmatic branches canaliculate, 1.0–1.2 mm long. Achenes linear, 7–9.5 × 2–2.8 mm, glabrous, smooth, longitudinally striate with ca. 20 resin ducts, with lateral concave detachment area and denticulate crown at apex; pappus simple, multiseriate, pappus elements decreasing in length outwards, the innermost ca. 12 mm long.

Distribution: endemic to NW Yunnan (China).

Yunnan: Long-Kon-Chan, *Delavay 4723* (B, BM, K); Lou-Pou, près Bong-Bekouan(?), *S. Beu 159* (*?*) (G); Yung Ning, *McLaren N205* (BM, E); Mekong Yangtze divide, 27°40' N, *G. Forrest 13146* (lectotypes; E); Western flank of the Lali Range, 25°40' N, *G. Forrest 11541* (paratypes; BM, E); Chungtien plateau, 27°35' N, *G. Forrest 10997* (paratype; BM, E); Jung-peh mountains, 26°42' N, *G. Forrest 16888* (paratypes; BM, E).

Klaseopsis L. Martins, **gen. nov.** – Typus nominis generici: *Klaseopsis chinensis* (S. Moore) L. Martins

Herba erecta, robusta, perennis. Capitula homogama hermaphroditica; involucri phylla exteriora et media obtusissima margine anguste scariosa. Flores purpurei vel rosei; stylus longe exsertus stigmate breviter bilobato. Achenia brunnea-atrata; pappus rufus multiseriatus setis scabridis, setae seriei intimae a ceteris 2–3-plo latiores et inconspicue longiores.

Klaseopsis is placed in Centaureinae (Asteraceae, Cardueae). It belongs to the *Rhaponticum* group sensu Hellwig (2004) and is probably closest related to *Rhaponticum* and *Acroptilon*, but differs from these genera by obtuse phyllaries with a very narrow scarious margin, additionally from *Acroptilon* by considerably larger capitula, and from *Rhaponticum* by branched stems and generally smaller capitula.

The single species of *Klaseopsis* known so far has previously been included in *Serratula* and in *Klasea*, from which it differs by the presence of a double pappus with broader inner pappus elements, by the shape of the phyllaries, and by its chromosome base number (Martins & Hellwig, 2005b).

Klaseopsis chinensis (S. Moore) L. Martins, **comb. nov.**
≡ *Serratula chinensis* S. Moore in J. Bot. 13: 228. 1875 ≡ *Klasea chinensis* (S. Moore) Kitag., Neo-Lineam. Fl. Manshur. 4: 654. 1979. – Holotypus: China, Jiangxi: Kiukiang [Kewkiang, Jiujiang], 1873, leg. *Shearer s.n.* (K!).
= *Centaurea missionis* H. Lév. in Repert. Spec. Nov. Regni Veg. 8: 451. 1910.
Icon.: Fig. 2; Anonymus (1975): Fig. 6716.

Plant perennial, herbaceous, 60–120 cm tall; stem erect, usually branched, sparsely arachnoid, glabrescent to glabrous, foliated throughout, inflated below capitula, lateral branches often leafless in their lower half. Leaves scabrid, with scattered multicellular hairs and short-stalked (virtually sessile) glands, margin denticulate or dentate, middle stem leaves petiolate, petiole 1–4.5 cm long, leaf blade elliptic, ovate-elliptic, or narrowly elliptic, rarely obovate, acuminate, base cuneate, 7–20 cm long and (1.2–)3–10 cm wide, upper leaves sessile or subsessile, similar to middle stem leaves, decreasing in size upward. Capitula (1–)2–4(–8), solitary, terminal, involucre bowl-shaped, 15–30 mm in diameter, 20–30 mm long; phyllaries in 5–7 rows, purple-tinged, apex obtuse, with narrow scarious margin, outside glabrous and striate, inside with dense clavate hairs, outer phyllaries ovate to elliptic, 5–13 × 3–5 mm, inner and innermost phyllaries elliptic to linear-elliptic, 20–26 × 2–5 mm. Florets bisexual; corolla purple-red, 18–30 mm long,

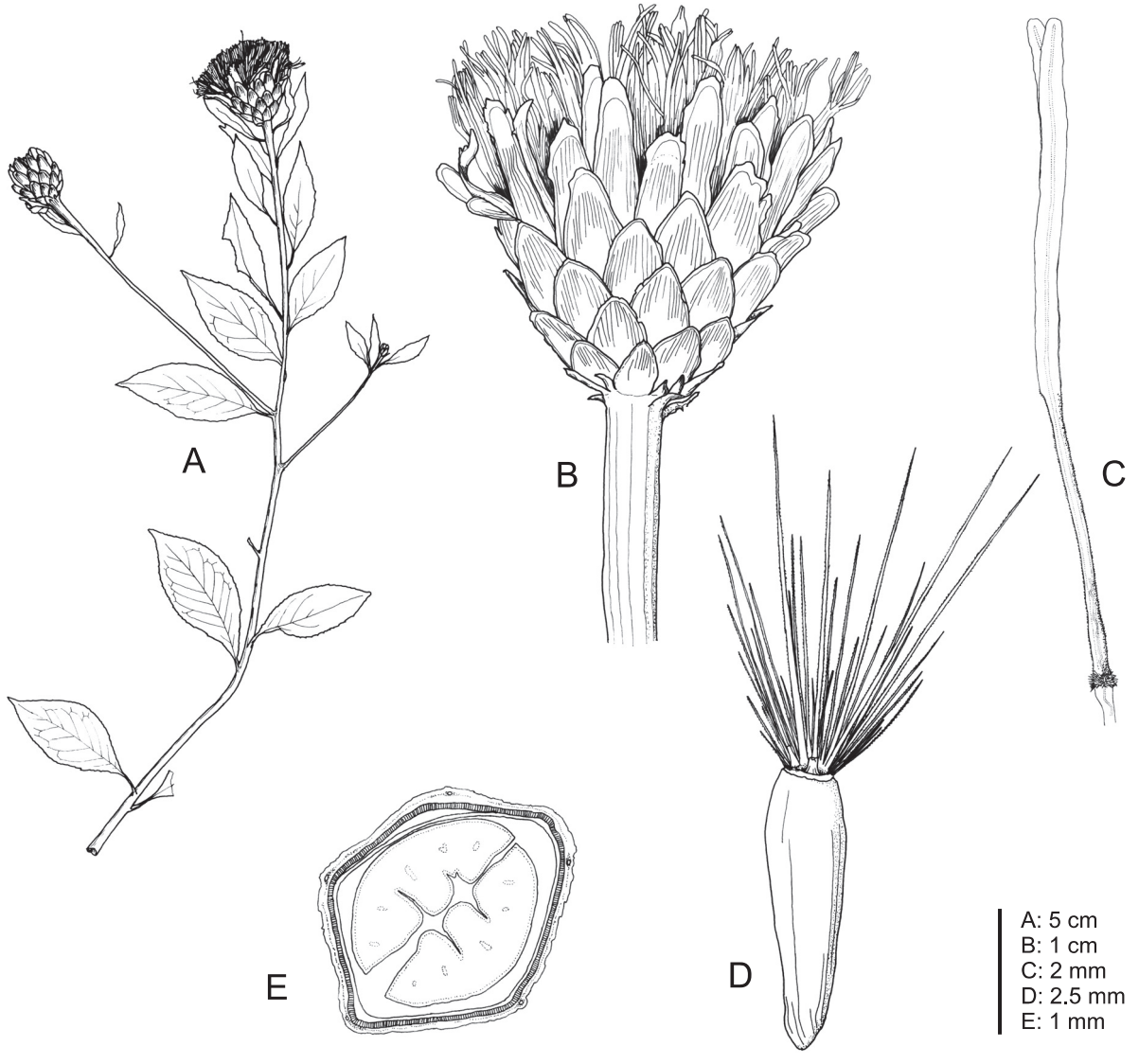

Fig. 2. ***Klaseopsis chinensis*****. A, habit; B, capitulum; C, style (distal part); D, achene (pappus partially removed); E, cross-section of achene. A, B:** ***Farges 1565*** **(B), C:** ***Price 1158*** **(K); D, E:** ***Tsang 20662*** **(K).**

tube slender, 11–14 mm long, corolla lobes 6–9 mm long; anthers 8–11 mm long, basal anther appendages 0.6–1.2 mm long, apical anther appendages 1.4–2.6 mm long, free part of apical appendages ca. 0.5 mm long and obtuse to slightly emarginate or ca. 1 mm long and acuminate, filaments covered with 40–60 µm long papillae; style above ring of sweeping hairs 8–10 mm long; stigma 3–5 mm long, connate for most of its length, free stigmatic branches 0.5–0.8 mm long. Achenes dark brown, narrowly ellipsoid, 5–8 mm long, slightly laterally compressed in the center of the capitulum, transitioning into dorsiventrally compressed towards the margin; pappus double, multiseriate, pappus elements brownish, straight, fragile, finely serrulate; the innermost 10–16 mm long and 0.18–0.32 mm wide, all other decreasing in length outwards and conspicuously narrower. $2n = 26$.

Distribution: endemic to China.

Guangdong: Chong Uen Shan near Kau Fung, Loh Ch'ang district, *W.T. Tsang 20662* (B, K, W), *W.T. Tsang 20930* (W); Lokchong, *Tsiang Ying 1224* (E); **Guizhou**: *J. Cavalerie s.n.* (type of *Centaurea missionis* H. Lév.; E! Differs from all other specimens by narrower leaves with larger acute teeth and by acuminate apical anther appendages); **Hubei**: W. Hupeh, Paokang, *E. H. Wilson 2583* (K, W); **Jiangxi**: Kiukiang [Kewkiang, Jiujiang], *Shearer s.n.* (holotype, K); **Sichuan**: Su-tchuen oriental, district de Tchen-Kéou-tin, *R.P. Farges 1565* (B, K); according to Shih (1987) also in Anhui, Henan, Hunan, Shaanxi, and Zhejiang.

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