BIEBERSTEINIACEAE

熏倒牛科 xun dao niu ke

Xu Langran (徐朗然 Xu Lang-rang)[1]; Dionyssios D. Vassiliades[2]

Perennial herbs with woody, occasionally tuberous rhizomes. Stems erect or plants nearly stemless, suffruticose. Indumentum of simple or stipitate glandular capitate trichomes. Leaves cauline or all nearly basal, alternate, stipulate; leaf blade 1–3-pinnatisect. Flowers bisexual, 5-merous, actinomorphic, 2-bracteolate in paniculate, spicate, or pseudocapitate inflorescences. Sepals free, persistent, occasionally accrescent in fruit. Petals free, alternating with 5 extrastaminal nectary glands, yellow to reddish yellow, rarely white, often denticulate at apex. Stamens 10; filaments connate at base; anthers tetrasporangiate, introrse. Gynoecium of 5 carpels; ovary superior, deeply lobed with 5 free gynobasic stylodia connected above into a capitate stigma; ovules pendulous, anacampylotropous, unitegmic, crassinucellate. Fruit a schizocarp, consisting of 5 indehiscent 1-seeded dry mericarps. Seeds large with rounded raphe; embryo slightly curved, with scanty endosperm.

One genus and four species: montane, semiarid, or occasionally forested regions from Greece to central China; two species (one endemic) in China.

Biebersteinia had traditionally been placed in the Geraniaceae, but there is now ample, mainly molecular, evidence that it comprises a separate family in the Sapindales. Muellner et al. (Pl. Syst. Evol. 266: 233–252. 2007) also traced the ancestral origin of this family to China.

Xu Langran & Huang Chengchiu. 1998. *Biebersteinia*. *In:* Xu Langran & Huang Chengchiu, eds., Fl. Reipubl. Popularis Sin. 43(1): 86–89.

1. BIEBERSTEINIA Stephan, Mém. Soc. Imp. Naturalistes Moscou, ed. 2, 1: 89. 1811.

熏倒牛属 xun dao niu shu

Morphological characters and geographical distribution are the same as those of the family.

A third species, *Biebersteinia multifida* Candolle, reaches the eastern limit of its distribution near the western borders of China, and it is possible that it may yet be found in China. It is a species with a tuberous rhizome 2–4 cm in diam., 3-pinnatisect leaves with linear segments, and flowers in lax paniculate inflorescences.

All species of *Biebersteinia* possess a characteristic odor and are viscid to the touch. They all have medicinal properties and are used by the local people to some degree.

1a. Leaf blade 1-pinnatisect with obtuse lobes; inflorescence a short, few-flowered raceme; plants suffrutescent; base of stem densely covered with old petioles ..... 1. *B. odora*
1b. Leaf blade 3-pinnatisect with linear segments; inflorescence long, many flowered; plants herbaceous; base of stem sometimes sparsely covered with old petioles ..... 2. *B. heterostemon*

1. Biebersteinia odora Stephan, Mém. Soc. Imp. Naturalistes Moscou, ed. 2, 1: 89. 1811.

高山熏倒牛 gao shan xun dao niu

Biebersteinia emodi Jaubert & Spach.

Plants ± suffrutescent, erect, with a pleasant odor when fresh. Rhizome stout, ca. 5 mm thick, upper part densely covered with withered remains of petioles. Stem 10–30 cm, few branched or unbranched. Leaves all nearly basal; stipules brown, lanceolate, 2- or 3-fid or -partite, pubescent glandular; leaf blade 6–14 cm at anthesis, 1-pinnatisect; segment pairs 12–18, sessile, 4–20 mm, pinnatifid or pinnatipartite into obtuse lobules. Inflorescences short, few-flowered racemes; bracts leaflike, ovate-oblong, 4–6 mm, margin often irregular; bracteoles 2, lanceolate-ovate, shorter than bracts. Flowers nodding at first, lower ones remote, ca. 1.2 cm wide; pedicel to 2 cm, glandular hairy. Sepals unequal, elliptic-oblong, 7–9 mm, glandular pubescent. Petals yellow, occasionally orange near base, suborbicular-obovate, 1.25–1.5 × as long as sepals, sparsely ciliate and strigose on inner surface, narrow at base. Filaments 5–6 mm, villous. Mericarps ca. 3 mm, strigose, rugose. Fl. Jul–Aug, fr. Sep–Oct. 2*n* = 10*.

Scree slopes, near glaciers, rocky and gravelly areas; (1600–) 4200–5600 m. W Xinjiang, SE and W Xizang [N India, Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, N Pakistan, C Russia, Tajikistan].

2. Biebersteinia heterostemon Maximowicz, Mém. Acad. Imp. Sci. Saint Pétersbourg, Sér. 7, 11: 176. 1880.

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Rhizome ca. 1 cm thick, upper part sparsely covered with withered remains of petioles. Stem erect, 0.4–1.2 m (to more than 2 m), moderately leafy, few branched. Stipules brown, semiovate, to 1 cm, margin mostly erose-laciniate, apex obtuse; leaf blade lanceolate, to 25 × 6–8 cm, 3-subpinnatisect, bearing long simple hairs and small stipitate glands; segments ± linear, to 1 cm, apex subacute. Inflorescences long, many flowered; bracts leaflike, lanceolate, 1–1.5 cm, covered with simple hairs, rarely glabrous, margin entire, apex acuminate; bracteoles lanceolate,

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2–4 mm, margin slightly hairy or glabrous, apex acuminate. Flowers often in fascicles of 2 or 3; pedicel 1–4 cm, 1–5 × as long as sepals, sparsely hairy or glandular. Sepals broadly ovate, ca. 7 × 5 mm, margin entire, apex obtuse to acute; outer sepals stipitate glandular and hairy toward base, inner ones subglabrous. Petals yellow, obovate, somewhat shorter than se-pals, apex denticulate-undulate. Filaments hairy at base, in an annulus with 5 ovate lobes. Mericarps ca. 2.5 mm, slightly rugose. Fl. May–Aug, fr. Jul–Sep. 2*n* = 10*.

● Hill slopes, loess slopes, meadows, gravelly areas along rivers; 1000–3500 m. Gansu, Ningxia, Qinghai, N and W Sichuan, ?E Xinjiang, E Xizang.

The species was reported from E Xinjiang by C. Y. Yang (Claves Pl. Xinjiang. 3: 212. 1985), who noted that no specimens had been seen. The authors have not been able to confirm this record.