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# Two New Species of *Carex* sect. *Racemosae* (Cyperaceae) from China

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**ABSTRACT.** Two new species, *Carex bijiangensis* S. Y. Liang & S. R. Zhang and *C. obliquitruncata* Y. C. Tang & S. Y. Liang, are described and illustrated. Both species are found in China and belong to *Carex* sect. *Racemosae* G. Don by having typically female lateral spikes, a gynecandrous terminal spike, dark female glumes, and three stigmas.

**Key words:** *Carex*, China, Cyperaceae.

In preparing the taxonomic treatment of Cyperaceae for *Flora of China*, the authors found two new species of *Carex* from southwestern China. Based on their female (or occasionally gynecandrous) lateral spikes, a gynecandrous terminal spike, dark female glumes, and three stigmas, both new species belong to section *Racemosae* G. Don (1830), which is a large section within *Carex*, with about 60 species in extratropical areas of Eurasia and North America (Egorova, 1999). There are about 24 species of the section in China, mainly occurring in northeastern, northwestern, and southwestern China (Liang, 2000). Section *Atratae* (Heuffel) H. Christ (1885) may be the more familiar sectional name in *Carex*, but section *Racemosae* G. Don is an earlier valid name for the section as determined by Reznicek (2001).

**1. *Carex bijiangensis*** S. Y. Liang & S. R. Zhang, sp. nov. TYPE: China. Yunnan: Mt. Biluo Shan, Bijiang, 4000 m, 18 Aug. 1934, H. T. Tsai 58022 (holotype, PE). Figure 1.

Haec species *C. kansuensi* Nelmes et *C. gmelinii* Hooker et Arnott affinis, sed utriculis anguste ellipticis, membranaceis, aveniis, ore rostri truncato vel emarginato differt.

Rhizome short; culms tufted, 50–60 cm high, ca. 2.5–3.5 mm wide, triquetrous, with purplish brown, leafless and sometimes fibrillose sheaths at base. Leaves shorter than culms, 4–7 mm wide, flat. Inflorescence racemose, with 4 to 6 spikes; bracts without sheaths, lowest 1 or 2 leaf-like, exceeding inflorescence, upper ones bristle-like, shorter than inflorescence; upper spikes congested, lowest 1 or 2 remote; the terminal spike gynecandrous, cylindrical, 2.5–3.5 × ca. 1 cm, the lateral ones female, occasionally gynecandrous, oblong or cylindrical, 2–

3 × ca. 0.8–0.9 cm, the lowest spike with a peduncle 8–12 mm long, upper ones with shorter or sessile peduncles. Female glumes ovate-lanceolate, 6–6.5 × 2 mm, with long scabrous awns 1–1.5 mm long, membranous, dark brown, 1-nerved; utricles shorter than glumes, narrowly elliptic, 4–5 mm long, veinless, membranous to almost coriaceous, yellowish green to dark purple, apices attenuate into short beaks ca. 0.2 mm long, beak mouths purple-black, truncate or emarginate; stigmas 3. Nutlets narrowly obovate, trigonous, yellow, 2.5 mm long.

**Distribution and habitat.** The new species is found in southeastern Xizang (Tibet) and northwestern Yunnan, China, and has been collected from mountain slopes, shrub- and grasslands, alpine meadows, and ditch sides, from elevations 3100–4300 m.

**Phenology.** Flowering and fruiting from July to September.

**Etymology.** The epithet is based on “Bijiang,” a county from Yunnan, China, where the holotype of the species was collected.

**Affinities.** *Carex bijiangensis* is associated with those *Carex* that possess robust culms and larger glumes and utricles within section *Racemosae*, and is similar to *C. kansuensis* and *C. gmelinii* by having stout culms (2.5–4 mm wide), larger acute or awned glumes (6–6.5 mm long), and larger utricles (4–5 mm long). The differences among these three species are listed in Table 1.

**Paratypes.** CHINA. **Xizang:** Ridong, Zayu, *Qinghai-Xizang Exped. 10238* (PE); Cawalong, Zayu, *C. W. Wang 65963a* (PE). **Yunnan:** Bijiang, H. T. Tsai 54125 (PE), H. T. Tsai 58093 (PE); Cizhong, Deqen, K. M. Feng 5306 (PE); Pika, Zhongdian, T. T. Yu 11924 (PE).

**2. *Carex obliquitruncata*** Y. C. Tang & S. Y. Liang, sp. nov. TYPE: China. Yunnan: Gongshan, grassy slopes, 4000 m, 30 Sep. 1938, T. T. Yü 22740 (holotype, PE). Figure 2.

Species *C. schneideri* Nelmes similis, sed culmis 25–50 cm altis, bractea ima sterili, utriculis atropurpureis, enervibus, oribus oblique-truncatis, nuculis minoribus, ca. 1.5 mm longis, ovatis differt.



Figure 1. *Carex bijiangensis* S. Y. Liang & S. R. Zhang. —A. Plant. —B. Female glume. —C. Utricle. —D. Nutlet. Drawn from the holotype, Tsai 58022 (PE).

Rhizome short; culms tufted, 25–50 cm high, 1–2.5 mm wide, triquetrous, upper part scabrid, with purple or dark brown, leafless and fibrillose sheaths at base. Leaves shorter than culms, 2–3.5 mm wide, flat, acuminate. Inflorescence racemose; lowest bract leaf-

like, sterile, ca. 5–10 × 0.2 cm, exceeding the inflorescence, without sheath, upper fertile bracts bristle-like; spikes 3 or 4, congested or the lowest one remote; terminal spike gynecandrous, 1.5–2.5 cm long; lateral ones female, or occasionally with a few

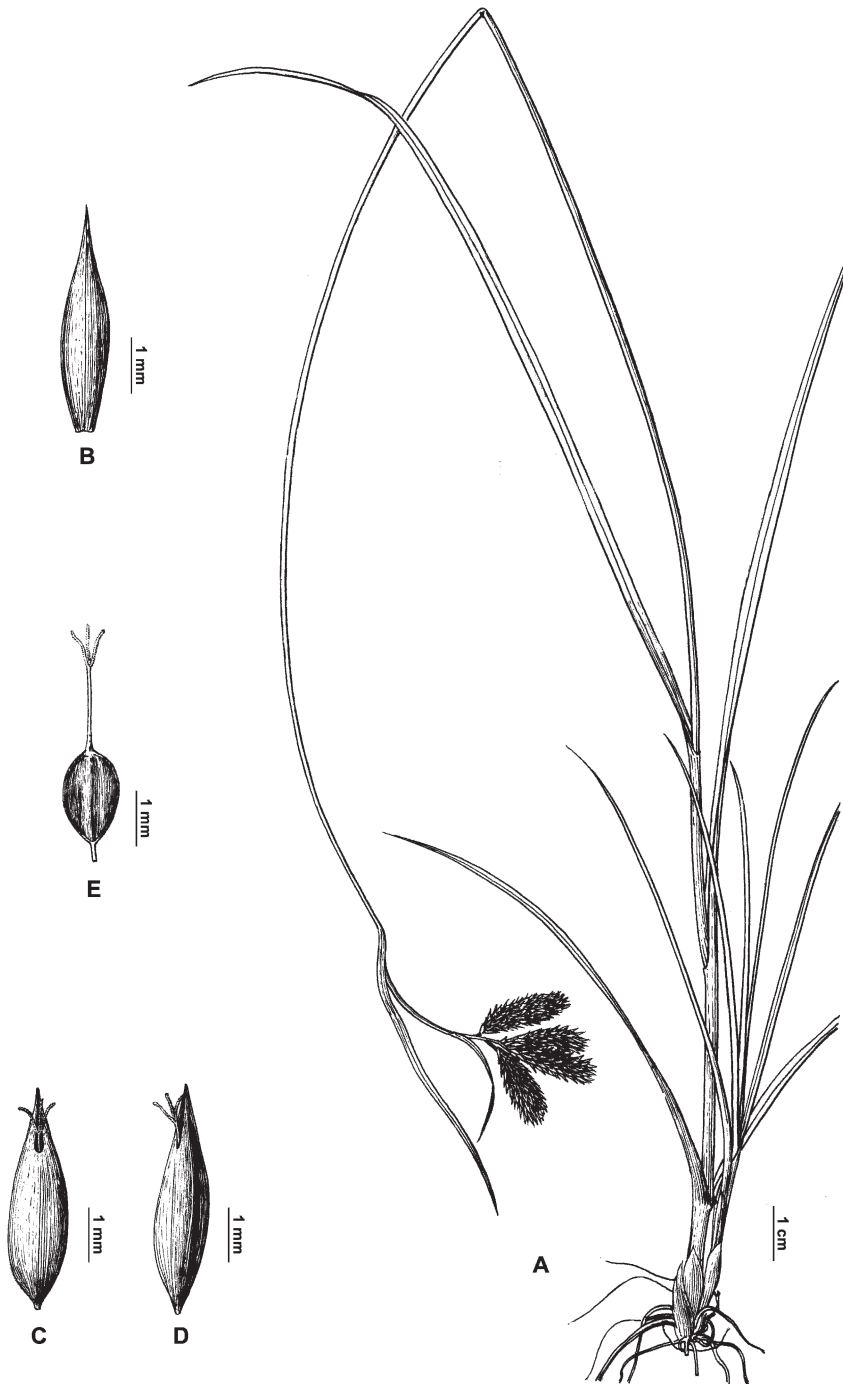


Figure 2. *Carex obliquitruncata* Y. C. Tang & S. Y. Liang. —A. Plant. —B. Female glume. —C. Utricle (abaxial view). —D. Utricle (lateral view). —E. Nutlet. Drawn from the holotype, *Yü 22740* (PE).

male flowers at base, oblong or cylindrical, 1.5–2.5 × ca. 0.8 cm, purplish brown; upper spikes nearly sessile, the lowest one with a peduncle 2–5 mm long. Female glumes narrowly lanceolate, 3.5–4 × 1 mm,

dark purple, 1-nerved; utricles narrowly oblong or narrowly elliptic, 3.2–4 mm long, membranous, yellowish green to dark purple, veinless or with 3 to 5 short veins, base contracted and shortly stiped, apices

Table 1. Morphological comparison of *Carex bijiangensis*, *C. gmelinii*, and *C. kansuensis*.

Characters	<i>C. bijiangensis</i>	<i>C. gmelinii</i>	<i>C. kansuensis</i>
Distribution	SW China (SE Xizang and NW Yunnan)	Russian Far East, NE China, Japan, NW North America	NW to SW China (Gansu, Shaanxi, W Sichuan, E Xizang, and NW Yunnan)
Glumes	6–6.5 mm, long awned	ca. 4–5 mm, long awned	4–4.5 mm, not awned
Utricles	4–5 mm, narrowly elliptic, veinless	4–5 mm, broadly elliptic to elliptic, veined	ca. 4–4.5 mm, broadly oblong, veinless
Utricle beaks	truncate or emarginate	emarginate	minutely bidentate
Nutlets	2.5 mm, narrowly obovate, trigonous, not compressed	ca. 2 mm, obovate, trigonous, slightly compressed	ca. 2 mm, oblong, trigonous, not compressed

Table 2. Morphological comparison of *Carex obliquitruncata* and *C. schneideri*.

Characters	<i>C. obliquitruncata</i>	<i>C. schneideri</i>
Culms	25–50 cm	60–90 cm
Utricles	yellowish green to dark purple, veinless or with 3 to 5 short veins, apices acuminate and not forming beaks, mouth of utricle obliquely truncate	yellowish green, veined, apices rounded to blunt, shortly beaked, with beaks 0.1–0.2 mm, mouth of beak emarginate
Nutlets	ca. 1.5 mm, obovate	2 mm, oblong

attenuate, acuminate, not forming beaks, utricle mouths obliquely truncate; stigmas 3. Nutlets included in the lower part of utricle, ovate, trigonous, tiny, ca. 1.5 mm long, castaneous, sessile.

**Distribution and habitat.** The new species was collected from northwestern Yunnan, China, from grassy slopes, grasslands, and pond sides, from elevations 3000–4000 m.

**Phenology.** Flowering and fruiting from August to October.

**Etymology.** The species is named “obliquitruncata” due to the shape of the summit of the utricle.

**Affinities.** The new species is unique in *Carex* sect. *Racemosae* in bearing an obvious sterile bract below the inflorescence and the summit of the utricle being obliquely truncate. Nevertheless, it is assigned to section *Racemosae* based on its female lateral spikes, a gynecandrous terminal spike, and dark female glumes. The species is similar to and sympatric with *C. schneideri*. They differ from each other by several morphological characters, which are listed in Table 2.

**Paratypes.** CHINA. **Yunnan:** Mt. Biluo Shan, Bijiang, H. T. Tsai 58237 (PE); Changputong, Gongshan, K. M. Feng 7863 (PE); Sijitong, Gongshan, C. W. Wang 67289 (PE).

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