Carex staintonii, a New Species of Cyperaceae from Nepal

Xiao-Feng Jin, Hiroshi Ikeda, Okihito Yano, Wei-Jie Chen and Ying-Ying Zhou

aSchool of Life and Environment Sciences, Hangzhou Normal University, No. 16 Xuelin Street, Xiasha Higher Educational District, Hangzhou, Zhejiang, 310036 CHINA; bThe University Museum, the University of Tokyo, 7-3-1, Hongo, Bunkyo-ku, Tokyo, 113-0033 JAPAN; cFaculty of Biosphere-Geosphere Science, Okayama University of Science, 1-1, Ridai-cho, Okayama-shi, Okayama, 700-0005 JAPAN

*Corresponding author: docxfjin@163.com
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Carex staintonii X. F. Jin, H. Ikeda & O. Yano, a new species of Carex sect. Trachychlaenae (Cyperaceae) from Nepal, is described and illustrated. This new species is similar to C. setigera D. Don, but differs by having short rhizomes (stoloniferous in C. setigera), caespitose culms (loosely caespitose in C. setigera), pistillate spikes 3–4 mm wide (5–6 mm wide in C. setigera), and pistillate scales shortly awned at the apex (long awned in C. setigera). SEM micromorphology of perigynia and achenes of C. staintonii and C. setigera is shown for comparison.

Key words: Carex setigera, Carex staintonii, Cyperaceae, Nepal, new species, scanning electron microscope (SEM).

Carex L. (Cyperaceae) contains ca. 1800 species (Govaerts et al. 2007), 66 of which have been enumerated in Nepal (Press et al. 2000). Carex sect. Trachychlaenae Drejer, comprising about nine species, is mainly found in Europe, northern Africa, western India, Mexico to North America, and the Himalayan region (Kükenthal 1909). Among those areas, the Himalayan region is thought to be the diversity hotspot (Kükenthal 1909, Koyama 1978, Dai et al. 2000, 2010).

While revising Carex for the Flora of Pan-Himalaya and the Flora of Nepal, we found several unfamiliar specimens of Carex sect. Trachychlaenae from Nepal in the Herbarium of the University of Tokyo (TI). After comparing them with other specimens and after searching the literature, we concluded that they represent an undescribed species, which we here name C. staintonii X. F. Jin, H. Ikeda & O. Yano.

The microstructure of the perigynia and/or achenes has been frequently used in the taxonomy of Cyperaceae (Rajbhandari and Ohba 1988, Zhang 2002, 2006), as well as in the genus Carex (Toivonen and Timonen 1976, Menapace et al. 1986, Waterway 1990, Dan and Hoshino 1994, Zhang et al. 2000, Oda et al. 2003, Jin et al. 2012, Jin and Zheng 2013). The morphology and micromorphology of the perigynia and achenes of C. staintonii and the closely related C. setigera were observed and compared by scanning electron microscope (SEM), following the methods of Jin et al. (2012).
Carex staintonii X. F. Jin, H. Ikeda & O. Yano, sp. nov. [Figs. 1, 2A–D]

Species nova est proxima Carici setigerae D. Don, a qua rhizomatibus brevioribus, culmis caespitosis, spicis pistillatis 3–4 mm latis, squamis pistillatis apice breviter aristatis differt. 

Type: NEPAL. Gosainkund, Malemci, on rocks, 28°02ʹN, 85°32ʹE, ca. 2400 m, 29 May 1962, J. D. A. Stainton 3772 (TI–holotype; BM–isotype).

Herbs perennial. Rhizomes short, less than 5 mm long, indurate. Culms 30–75 cm tall, 1–1.5 mm thick, acutely trigonous, glabrous, smooth, with reddish brown or brown filiform sheaths at base. Leaves longer than or equaling culms; blade 1.5–3 mm wide, revolute or flat, margins and abaxial surfaces scabrous. Involucral bracts leaf-like, longer than inflorescence, lower ones sheathed, upper ones nearly sheathless; sheaths 5–30 mm long, lowest sheath longer than others. Spikes 4–7; terminal 1–3 staminate, clavate-cylindrical, 1–3.5 cm long, 2–3 mm wide; others remote, pistillate or sometimes with a few staminate flowers at apex, cylindrical, densely flowered, 2–4.5 cm long, 3–4 mm wide; peduncles slightly exerted from sheaths or enclosed. Staminate scales oblong-elliptic, 4–4.5 mm long, pale yellowish brown, apex acuminate, with 3 pale brown veins on dorsal costa. Pistillate scales obovate, ca. 2 mm long (including awn), pale yellowish brown, apex acuminate and short awned, with 1 pale brown vein on dorsal costa. Perigynia broadly obovoid (excluding beak), trigonous, slightly longer than or nearly equaling pistillate scales (including beak), 2–2.2 mm long, greenish yellow, herbaceous, whitish hispidulous, inconspicuously veined, base attenuate and short stipitate, apex abruptly contracted into a short beak; orifice 2-toothed, teeth minute. Achenes tightly enveloped, broadly obovoid, trigonous, castaneous, ca. 1.5 mm long, base attenuate and short stipitate; styles glabrous, not thickened but curved at base; stigmas 3.


Note: Carex staintonii belongs to sect. Trachychlaenae and resembles C. setigera in having remote spikes, dense flowers, 1–3 terminal staminate spikes, perigynia densely hispidulous with apex contracted into a short beak, styles not thickened at base and stigmas 3. However, C. staintonii differs from C. setigera by having short rhizomes, caespitose culms, pistillate spikes 3–4 mm wide, and pistillate scales shortly awned at the apex (Fig. 1). Characters distinguishing C. staintonii from C. setigera are detailed in Table 1.

The morphology and micromorphology of the perigynia and achenes of Carex staintonii

<table>
<thead>
<tr>
<th>Character</th>
<th>C. staintonii</th>
<th>C. setigera</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhizome</td>
<td>short</td>
<td>stoloniferous, creeping</td>
</tr>
<tr>
<td>Culm</td>
<td>caespitose, 30–75 cm tall</td>
<td>loosely caespitose, 25–40 cm tall</td>
</tr>
<tr>
<td>Involucral bract</td>
<td>all longer than inflorescence</td>
<td>lower longer than inflorescence, but uppermost shorter</td>
</tr>
<tr>
<td>Pistillate spike</td>
<td>2–4.5 cm long, 3–4 mm wide, without or sometimes with a few staminate flowers at apex</td>
<td>2–3 cm long, 5–6 mm wide, conspicuously androgy nous</td>
</tr>
<tr>
<td>Pistillate scale</td>
<td>obovate, shortly awned at apex</td>
<td>ovate, long awned at apex</td>
</tr>
<tr>
<td>Perigynium</td>
<td>2–2.2 mm long, slightly longer than pistillate scales, or nearly equaling in length</td>
<td>2.5–3 mm long, shorter than pistillate scales</td>
</tr>
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</table>

The morphology and micromorphology of the perigynia and achenes of Carex staintonii

C. staintonii belongs to sect. Trachychlaenae and resembles C. setigera in having remote spikes, dense flowers, 1–3 terminal staminate spikes, perigynia densely hispidulous with apex contracted into a short beak, styles not thickened at base and stigmas 3. However, C. staintonii differs from C. setigera by having short rhizomes, caespitose culms, pistillate spikes 3–4 mm wide, and pistillate scales shortly awned at the apex (Fig. 1). Characters distinguishing C. staintonii from C. setigera are detailed in Table 1.
and *Carex setigera* are shown in Fig. 2. The perigynia of *C. staintonii* are obovoid, trigonous, densely hispidulous, attenuate and short stipitate at the base and contracted into a short beak at the apex (Figs. 2A, 2B). The perigynia of *C. setigera* are similar to those of *C. staintonii* in shape, apex and base patterns, but extremely dense-hispidulous (Figs. 2E, 2F). The beak orifice is 2-toothed with minute teeth. The achenes of *C. staintonii* and *C. setigera* are obovoid, trigonous, with a short curved stipitate base and a curved apical beak (Figs. 2C, 2G). The epidermal cells of the achenes are irregularly 5- or 6-gonal, with straight inner periclinal walls. A single silica body is present in each cell (Figs. 2D, 2H).

Both perigynia and achenes of these two species are similar, which may indicate their close relationship. The difference between these species are similar, which may indicate their close relationship. The difference between these species are only in the length of the perigynia. The perigynium of *C. staintonii* (2.09 ± 0.07 mm) was significantly shorter than in *C. setigera* (2.74 ± 0.12 mm).

**Etymology:** The epithet, *staintonii*, honors John David Adam Stainton (1921–1991), a great plant hunter in the Himalaya, and who collected the specimens on which the new species is based.

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X.-F. Jin, 池田 博, 矢野 興一, W.-J. Chen, Y.-Y. Zhou: ネパール産カヤツリグサ科スゲ属 Trachychlaenae 節の1新種, Carex staintonii

カヤツリグサ科スゲ属 Trachychlaenae 節の1新種 Carex staintonii X. F. Jin, H. Ikeda & O. Yano をネパールから記載した。本種は C. setigera D. Don に似るが、茎葉が短いこと、茎が叢生すること、雌小穂が3–4 mm と狭いこと、雌鱗片の先は短い芒となることなどにより区別される。種小名の“staintonii”は、今回記載した新種のタイプ標本を採集し、ヒマラヤ地域における著名なプラントハンターとしても知られる、John David Adam Stainton (1921–1991)にちなんでつけられた。

（a 中国・杭州師範大学生命環境科学, b 東京大学総合研究博物館, c 岡山理科大学生物地球学部）