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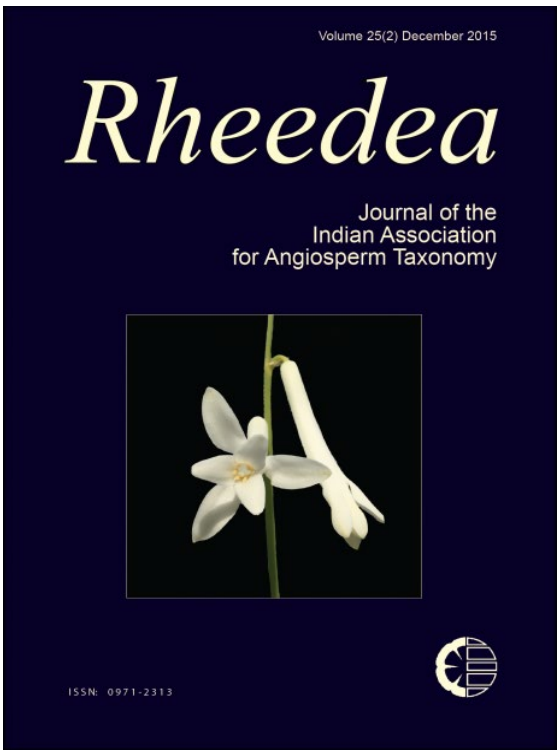


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# *Carex kotagirica* : A new species of Cyperaceae from the Nilgiris, Southern India

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## Abstract

*Carex kotagirica*, a new species of Cyperaceae is described from southern India. It differs from the closely allied *C. ligulata* and *C. pseudoligulata* by the shorter habit and in a combination of floral characters.

**Keywords:** *Carex*, New species, Nilgiri, Southern India

## Introduction

*Carex* L. is one of the largest genera of flowering plants and the largest in the family Cyperaceae. According to Goetghebeur (1998) there are about 2000 species in the world. Mabberley (2009) reported *c.* 1800 species under this genus, and as per the World Checklist (WCSP, 2015) it comprises 1816 species. In India, too, *Carex* is the largest genus of family Cyperaceae and according to Sharma (2000) it is the second largest genus of vascular plant families. Karthikeyan *et al*. (1989) reported of 160 species, one subspecies and 29 varieties which includes a few from the neighbouring countries. However, including the new reports in the recent past, at present the total number of species in the country is estimated to be *c.*160.

The genus is characterised by the presence of bottle-shaped utricles, which are homologous with the prophylls enclosing the female flower or achene. *Carex* of Asia was divided in different ways by different workers. Clarke (1894) treated all the distigmatic species under the subgenus *Vignea* and the tristigmatic species under the subgenus *Eucarex*. Koyama (1962) divided it into two subgenera as *Vignea* and *Carex* (*Eucarex*). Kern and Nooteboom (1979) followed almost same classification by treating the distigmatic species with lenticular achenes as subgenus *Vignea* and the tristigmatic ones with trigonous achenes as subgenus *Carex*. But certain distigmatic species that have peduncled spikes or a terminal male spike were also treated under subgenus *Carex*. In recent Floras the genus is divided into the subgenera *Psyllophora*, *Vigneastra, Vignea* and *Carex* by Kukkonen (2001) and into *Vignea, Vigneastra* and *Carex* by Lunkai *et al*. (2010).

During a recent fieldwork in the forests of Nilgiri hills in southern India, specimens of an interesting species of *Carex* were collected. A detailed study of the specimens and a perusal of the literature revealed that it is a new species allied to *C. ligulata* and *C. pseudoligulata*. The former is widely distributed in Indian subcontinent and China to Japan through Thailand, and the latter is endemic to China. The new taxon differs from these two mainly by its shorter habit and a combination of floral characters. The main differences are shown in **Table 1** below.

The new species described here can be placed under subgenus *Carex*, section *Propriae*, characterized by a terminal male spike. A detailed description of the plant is provided along with an illustration and Scanning Electron Microscope (SEM) images of the utricle and achene.

*Carex kotagirica* can be distinguished from the closely allied *C. ligulata* by its smaller habit, short leaves, and short spikelets, utricles and achenes. It can also be differentiated from *C. pseudoligulata* by its smaller habit, short spikelets, and larger female glumes and utricles. Also utricles are densely hirsute in *C. kotagirica*. But in *C. pseudoligulata* utricles are hispudulous on the veins and upper margins only.

**Table 1.** A comparison of important morphological characters of *Carex ligulata*, *C. pseudoligulata* and *C. kotagirica*

| Characters | *C. ligulata* | *C. pseudoligulata* | *C. kotagirica* |
|---|---|---|---|
| Culms | 30–80 cm long, often curved at base. | 35–65 cm long, somewhat curved at base. | 20–25 cm long, not curved at base. |
| Leaves | scabrous on dorsal surface and margins | scabrous on both surfaces and margins | scabrous on the margins towards apex |
| Male spike | 1.5–3 cm long | 2–2.5 cm long | 0.7–1 cm long |
| Female spikes | 2–5 cm long, 25–35–flowered | 1.5–4 cm long. 10–30-flowered | 1.2–2 cm long, 8–20-flowered |
| Utricle | 4–5 mm long (including the beak), hirsute throughout. | 3–3.5 mm long, hispidulous only on veins and upper margins | 4–4.5 mm long, densely hirsute. |
| Achene | obovoid, 2.5–3 mm long | ellipsoid or obovoid–ellipsoid, *c.* 2 mm long | ellipsoid, 1.8–2.2 mm long |

**Carex kotagirica** A. Maji & V.P. Prasad **sp. nov**.
**Figs. 1, 2**

*Type*: INDIA: **Tamil Nadu**, Nilgiri dist., Way to Kotagiri, 02.09.2014, *V.P. Prasad & Animesh Maji* 58467 (holotype CAL!, isotypes CAL!, MH!).

Perennial with short rhizome, 20–25 cm high. Rhizome ultimately woody, clothed with blackish remnants of old bladeless sheaths; roots wiry. Culms densely tufted, erect, trigonous, 3–4 mm thick, 5–7–noded, enclosed by the leaf sheaths; internodes 2.5–3 cm long, pubescent on the angles. Leaves 5–7 per culm, linear-lanceolate, acuminate at apex, 12–17 cm long, 5–7 mm wide, scabrous on the margins towards apex; lowest ones reduced to bladeless sheath or with a short lamina; sheaths hairy on the angles towards the mouth, membranous on the margin towards the lamina. Inflorescence with 3–5 somewhat closely arranged spikes. Bracts foliaceous, sheathing, exceeding the inflorescence. Spikes unisexual, peduncled, the terminal one male and all others females. Male spike erect, terete, on c. 1 cm long peduncle, linear, 7–10 × 1.5–2 mm, brownish, many-flowered. Male glumes membranous, oblong-ovate, acute to obtuse at apex, minutely to prominently mucronate, rarely some of the glumes muticous, 3–3.5 × 1.5–2 mm, with a prominent midrib which often surpass into a ciliate mucro, brown doted along the mid-vein and on both sides in upper half, pubescent along the upper margins. Stamens 3; filaments elongate up to 3 mm; anthers linear-oblong, c. 1.3 mm long. Female spikes erect to somewhat spreading, on a 4–6 mm long peduncle, cylindrical, oblong, 12–20 × 5–7 mm, densely many–flowered. Female glumes oblong–ovate, acute or at times somewhat retuse at apex, mucronate, 3–3.3 × *c.* 2 mm (including the mucro), with a prominent mid–vein extending to up to 0.3 mm long mucro, stramineous when dry, with brown dotted along the mid-vein and on both sides in the upper half, pubescent along the upper margins. Style c. 1.5 mm long; stigmas 3, protruding through the apex of the utricle. Utricle trigonous, ellipsoid, 4–4.5 × 1.2–1.7 mm (including the 1.1–1.5 mm long beak), brownish, densely hirsute, beaked; beak bifurcate at apex. Achene trigonous, ellipsoid, 1.8–2.2 × *c.* 1.1 mm, brownish.

*Flowering & Fruiting*: August – September.

*Distribution*: Endemic to the Nilgiris, Tamil Nadu, India. Found in moist forests on the hills, *c* 1800 m.

*Conservation status*: Data Deficient (DD) as per the IUCN categories (2001). The available information is inadequate to assess the risk factor, though the plant was found in a single locality. Therefore, more field work is required to determine the exact range of distribution and its population.

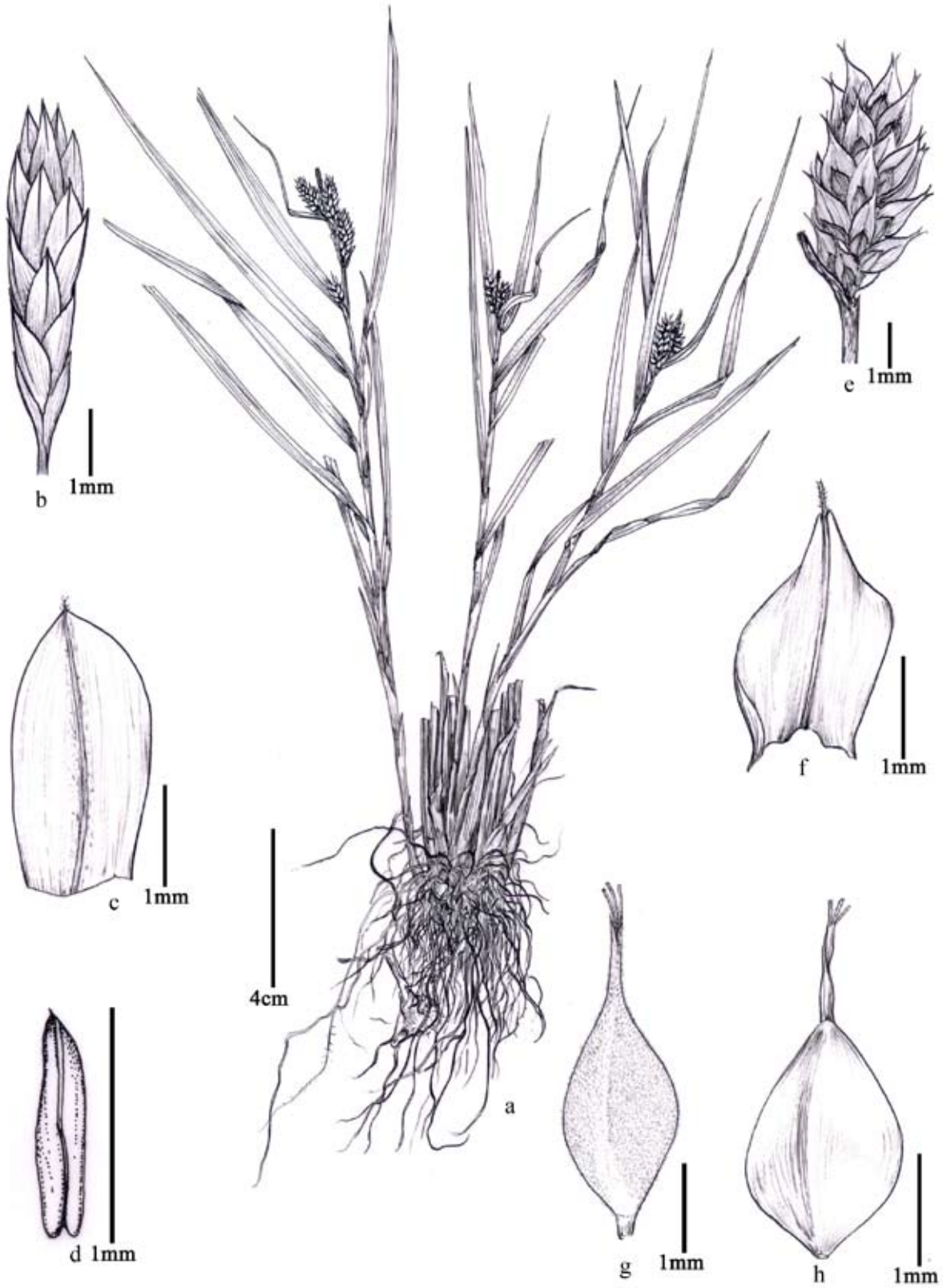


**Fig. 1.** *Carex kotagirica* A. Maji & V.P. Prasad *sp. nov.*: **a.** Habit; **b.** Male spike; **c.** Male glume; **d.** Anther; **e.** Female spike; **f.** Female glume; **g.** Utricle; **h.** Achene (V.P. Prasad & Animesh Maji 58467 CAL)

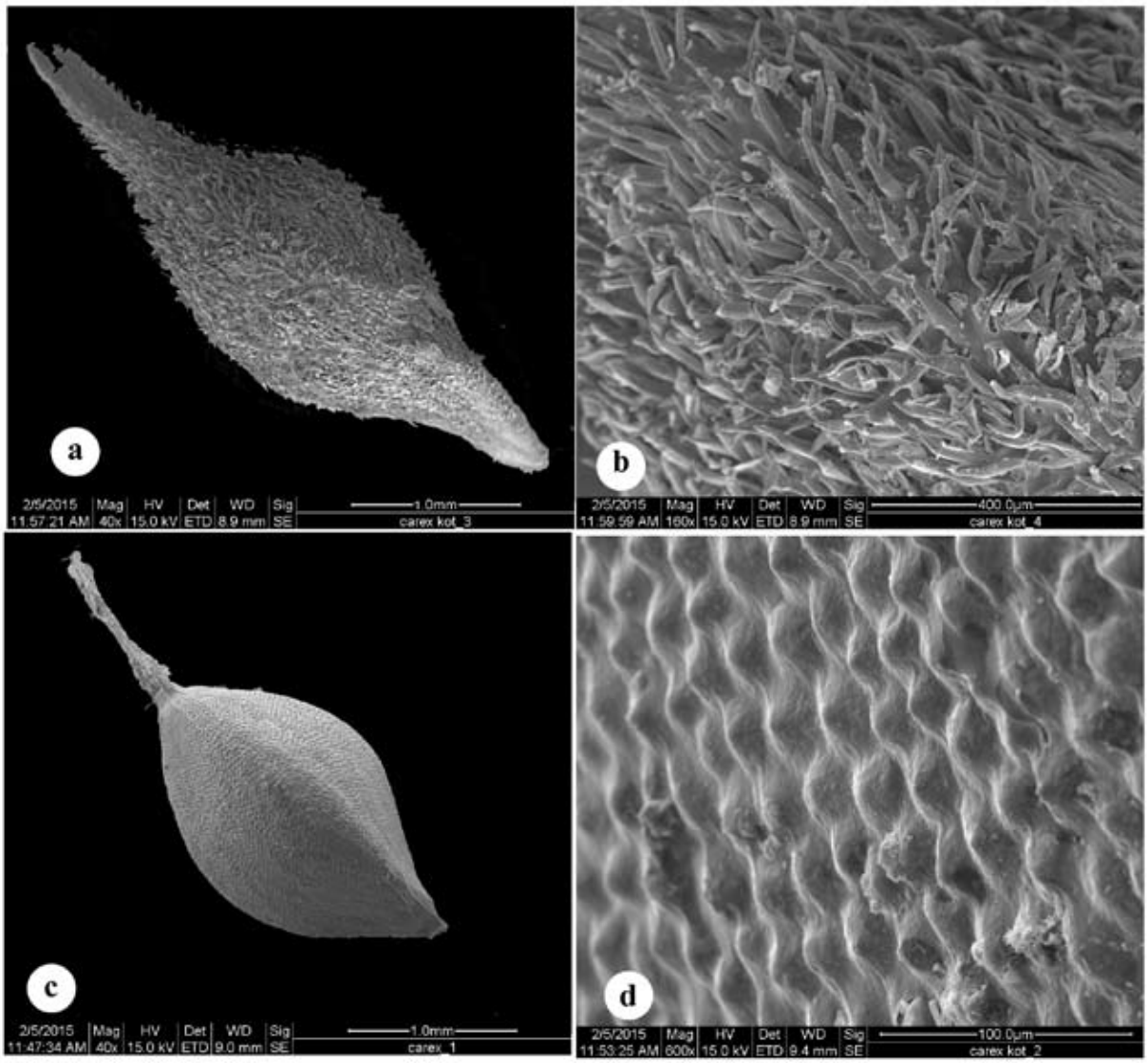


**Fig. 2.** SEM images of - **a.** Utricle; **b.** Densely hirsute surface of utricle; **c.** Achene; **d.** Achene surface

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