



Research Article

Lectotypification of *Carex courtallensis* (Cyperaceae) and notes on its morphology and habitat

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Abstract: During the revision of Cyperaceae in Western Ghats, a specimen was collected from Chemunji hills, Thiruvananthapuram District, Kerala, identified as *Carex courtallensis* Nees ex Boott, a species recollected after a gap of 150 years, about 50 km away from the type locality. On examining the protologue of the species and later works, along with specimens housed at various herbaria, we identified the need for lectotypification of the species. The present paper provides detailed description, photographs and relevant notes on the species based on recent collections.

Key words: Agasthyamala Biosphere Reserve, Kerala, Tamil Nadu, Lectotype

Introduction

Carex Linnaeus (1753: 972) is one of the largest and widespread genera with 2000 species in the world, roughly 40% of the family by species (Reznicek, 1990; Govaerts *et al.*, 2016; Global Carex Group, 2015). It has a cosmopolitan distribution particularly in temperate and cold regions at higher altitudes in the tropics (Deng, 2013). The genus is represented by c. 160 species in India, as it prefers cold and moist habitats of high lands, it has reached its greatest diversity in the Kashmir Himalaya and Western Ghats and represents one of the largest genera in these regions (Karthikeyan *et al.*, 1989; Prasad & Singh, 2002; Viji & Pandurangan, 2015).

Field exploration in the Agasthyamala Biosphere Reserve of Western Ghats, India yielded some interesting specimens of *Carex* from Chemunji hills, Thiruvananthapuram, Kerala, which showed apparent similarity with *Carex speciosa* complex. On detailed observation with literature and authentic specimen (E00393452 Isosyntype!), it was identified as *C. courtallensis* Nees ex Boott (in Boott 1858: 52) belonging to section Radicales (Kuek.) Nelmes. On examining the protologue of the species and a later revision of the genus, along with specimens housed at various herbaria, we identified the need for lectotypification of the species.

Robert Wight was a Scottish surgeon and botanist who spent 30 years in India. During his stay, he made extensive collections from South India (1819–1853) and sent them to Glasgow to be studied by William Hooker and George Arnott Walker, most of them later forming part of Arnott's herbarium (now in E). *C. courtallensis* was recognized by Nees von Esenbeck based on the collections of Robert Wight from Courtallum, part of the erstwhile Travancore hills (specimen *Wight 991*, 15th August 1835). There

is no manuscript description of *C. courtallensis* in the Nees volume (Wight's contribution) and the published description is by Boott (1858) in his monumental work on *Illustrations of the Genus Carex* (Noltie, pers. comm.).

The first full taxonomic treatment of sedges in India was given by C. B. Clarke (1894) in the *Flora of British India*, wherein 142 species of *Carex* under 7 sections in 2 subgenera were described. Subsequently no serious attempt was made on taxonomic studies of this genus in India and *C. courtallensis* remained unknown to taxonomists due to either misidentification as *C. speciosa* or lack of sufficient materials in regional herbaria (MH, CALI, TBGT, KFRI, UCT, BLAT, RHT), which was apparent during our search for the materials of *C. courtallensis*.

Dai *et al.* (2010) while revising the genus *Carex* in the Flora of China treated *C. courtallensis* as a separate species based on the collection from Yunnan. Recently Jin *et al.* (2015) followed Kükenthal (1909) and reduced its status to *Carex speciosa* var. *courtallensis* with *C. speciosa* subsp. *dilatata* Noltie (1993: 197) as its synonym. They cited 7 specimens from Sichuan and Yunnan. Critical examination of type specimens, protologues, wide range of materials housed at different herbaria (K, E, BM, P, PE, KUN, KYO, TBGT) and fresh collections by the authors nearer to the type locality suggests that *C. courtallensis* is quite distinct from *C. speciosa* and should be recognised as a separate species. The former can be differentiated from *C. speciosa* by plants up to 90 cm tall (vs. up to 50 cm tall), Rhizome >4 cm (vs. rhizome less than 4 cm), peduncles enclosed in bract sheaths (vs. peduncles not enclosed), nutlets stipitate (vs. nutlet not stipitate), agreeing with the observations by Raymond (1959).

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Lectotypification

Three sheets of *C. courtallensis* belonging to Wight's collection were traced out, of which two sheets are at Edinburgh herbarium and one at Kew herbarium. It appears that all the specimens were part of Wight's collection sent to Sir W. J. Hooker while he was Regius Professor of Botany at Glasgow University. The two sheets at E are from Walker-Arnott's herbarium, which was put on permanent loan to E in 1966. The sheet housed at Kew consists of 2 specimens, bearing the handwriting of Boott with collection data mentioned in the protologue, of which the right-hand specimen (K000061657!) exactly matches the illustration provided by him; which is designated here as lectotype. Both the specimens in the sheet are possibly part of same collection and should have been given two separate barcodes overlooking the Wight's numbering system. The confusion should have occurred due to the presence of a vertical red line in the middle of the sheet separating one plant from the other and, at the inferior left part there are 2 numbers 1835/991, the capsule at the centre has a number 991, and they should have assumed that the other number is for the other plant at the left and was given two barcodes. Incidentally the number on the capsule was written by Nelves who borrowed this sheet from Glasgow and kept a few utricles and wrote the pencil annotation on that capsule. Here, 991 is a field number given by Wight, and which should be cited as '[1835.]991' (because he re-used the same number in different years) (Noltie, 2005). Since both specimens were given two barcodes we are considering the right-hand specimen (K000061657!) as lectotype, and left-hand specimen (K000999016!) and sheets in E as isolectotypes in accordance with article 9.2 of ICN (McNeill et al., 2012).

Taxonomic treatment

Carex courtallensis Nees ex Boott, Ill. Gen. Carex 1:52, t. 138. 1858.

Type: INDIA. Tamil Nadu: Tirunelveli distr., Courtallum hills, 15 August 1835, *Wight [1835.]991*. – **lectotype (designated here)** K000061657 (right hand specimen)!; isolectotypes: K000999016 (left hand specimen)!, E00393452!, E00393453! – Figure 1A–C.

Perennial *herbs*, 35–80 cm tall. *Rhizomes* elongate, 5–15 × 2–3 cm. *Culms* tufted, 1–4 together, 1.5–2.5 mm thick, triquetrous, stiff, smooth. *Leaves* radical; sheath dark brown, 3–10 cm long; blades flat, 0.8–2 cm wide, smooth, soft. *Inflorescence* of terminal and auxiliary spikes; involucral bracts leaf-like, longer than inflorescence, 10–25 × 0.8–1.2 cm wide, flat, long sheathed. *Spikes* 2–6, androgynous, lowest one borne at middle part or base of the culm, cylindrical, 4–6 × 0.3–0.5 cm, densely flowered; male part 1–2 × 0.1–0.3 cm; female part 2–5 × 0.5–1 cm. *Glumes* green, ovate to ovate-oblong, 3–4 mm long, papery, uni-nerved, margin ciliate, apex rounded to obtuse. *Stamens* 3; anthers ca. 0.5 mm long. *Ovary* obovoid; style ca. 2 mm long; stigmas 3. *Utricle* green, elliptic, slightly inflated, trigonous, 4.5–5.5 × 2–2.8 mm, papery, glabrous, many veined, base attenuate, margins narrowly winged, ciliate, apex abruptly contracted into a short beak, orifice 2-toothed. *Nut* brown, obovate to oblong, trigonous, 2.5–3.5 × 1.5–2 mm, shortly stipitate, apex rounded. (Figure 1D, Figure 2 & 3).

Phenology: Flowering and fruiting was observed from May to December.

Note: The present collection from Chemunji, is a report of this little-known species after a lapse of 150 years about 50 km away from its type locality. The locality is characterised by low elevation montane evergreen forests and a fairly good population of this species is seen at an altitude of 1000–1200 m above m.s.l. Live collections are maintained in the field gene bank of Jawaharlal Nehru Tropical Botanic Garden and Research Institute.

Specimens examined: INDIA. Kerala, Thiruvananthapuram Distr., Chemunji, ± 1100 m, 26 October 2002, *M. P. Geethakumary 48420*; *ibid.*, 11 December 2014, *A. R. Viji 72320*; *ibid.*, 11 December 2014, *Deepu Sivadas 78700* (TBGT).



Figure 1. A-C. *Carex courtallensis* Nees ex Boott **A.** Lectotype - K000061657 (right hand specimen)! [© the Board of Trustees of the Royal Botanic Garden, Kew]; **B.** Isolectotype - E00393452! [© the Board of Trustees of the Royal Botanic Gardens, Edinburgh]; **C.** Isolectotype - E00393453! [© the Board of Trustees of the Royal Botanic Gardens, Edinburgh]; **D.** Recent collection - A. R. Viji 72320 (TBGT!)



Figure 2. *Carex courtallensis* Nees ex Boott **A.** Habit; **B.** Rhizome; **C–D.** Portion of leaf; **E–F.** Spike; **G–I.** Utricle; **J.** Nut. Photos Deepu S. from A. R. Viji 72320

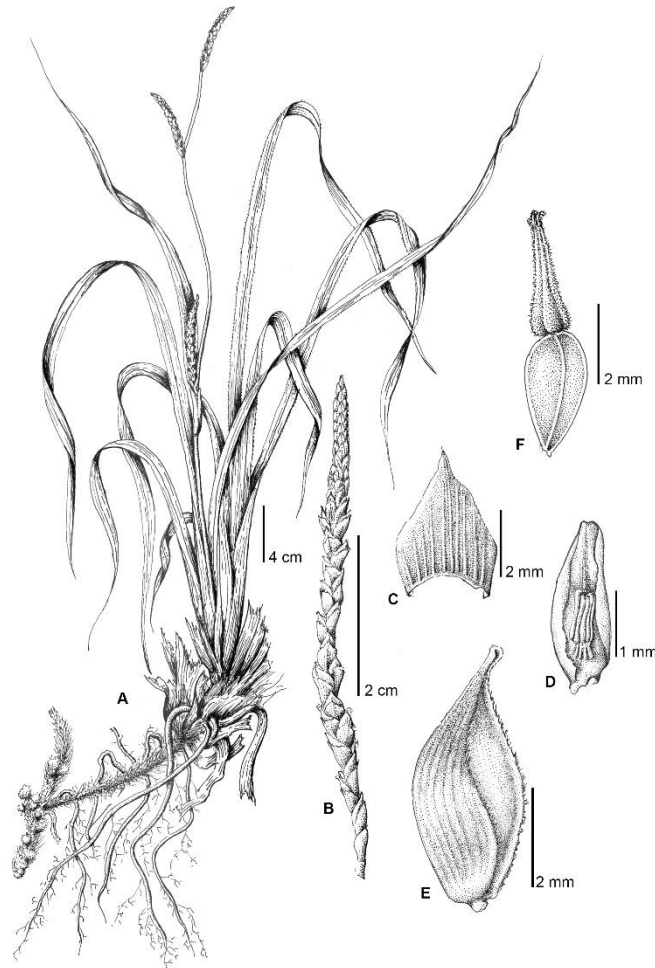


Figure 3. *Carex courtallensis* Nees ex Boott A. Habit; B. Spike; C. Glume; D. Glume with Stamens; E. Utricle; F. Nut. Drawn by T. Shaju

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