Notes on Cyperaceae plants collected from the Mongolia I. Shatan area in Tov Province.

Okihito YANO¹, Takuji HOSHINO¹, Hiroo NASU¹, Vanjil GUNDEGMAA², Davaadori SAINDOVDON², and Atsushi NAKAMOTO³

Abstract: Shatan area in Tov Province, Mongolia, is covered with taiga and forest steppe, being one of the plant-diversity-rich areas in Mongolia. For Cyperaceae, 132 species in 13 genera have been known from Mongolia. However, up to date, only 2 Cyperaceae species have been reported from Shatan area. We, therefore, made a field trip to the area between 1-4 July 2018, and collected specimens of Cyperaceae plants. Among the specimens, we recognized 21 taxa in 6 genera. Most of them (16 taxa) were of the genus Carex.

Cyperaceae L. is one of the largest monocots family, comprises 106 genera and ca. 5400 species occurring in the various habitats almost all over the world (Govaerts et al. 2007). In Mongolia, Nyambayar (2009) recognized 13 genera and 132 species of Cyperaceae in the flora of Mongolia (in Mongolian). Urgamal et al. (2014) also enumerated Nyambayar’s Cyperaceae species in an English translation checklist.

Shatan area is located in Batsumber soum of Tov province, 120 km north of Ulaanbaatar. Grubov (1982) recognized 16 botanico-geographic regions in Mongolia (Fig. 1). Although Shatan area have been included in the Mongolian Dauria mountain forest steppe region, it is located in margins of Khentei mountain taiga region (Fig. 1) and is usually recognized as the Khentei mountain taiga region (Badamtsatseng 2015). In Mongolian Dauria region 10 genera and 55 species of Cyperaceae, 36 of which are Carex,
are distributed, and 7 genera and 88 species of Cyperaceae, 70 of which are Carex, are distributed in Khentei mountain region (Urgamal et al. 2014). These regions indicate high level of diversity of Cyperaceae, particularly Carex, in Mongolia. In Shatan and adjacent areas, Darimaa et al. (2014) reported 61 families, 246 genera, and 467 species of vascular plants, but no Cyperaceae species. Badamtsetseg (2015) also reported 45 families, 121 genera, and 166 species of vascular plants in Shatan, two of which are Cyperaceae, Carex duriuscula C.A.Mey. and C. rostrata Stokes. From this diversity-rich area, only 2 Cyperaceae species have been reported, and we still need investigation for elucidation of the diversity of Cyperaceae in the area. We attempted to establish an inventory of the Cyperaceae plants at the Shatan area, Tov Province in Mongolia in July 2018.

During a field expedition between 1 - 4 July 2018, we made our research mainly on the roadsides, grasslands, wet places including small streams and pools around the Kharaa and Shatan Rivers, or on slopes and ridges of mountains (Fig. 2). In the Shatan area, we found a total of 21 taxa in 6 genera of Cyperaceae. Most of these taxa were in the genus Carex, including 16 taxa. These taxa are listed alphabetically below according to their genera and species. The number after each species indicates distributions in the Khentei mountain taiga region [2] and Mongolian Dauria mountain forest steppe region [4] based on Urgamal et al. (2014). All voucher specimens are deposited in the Herbarium of Okayama University of Science (OKAY), with duplicates available in the Department of Biology, Mongolian National University of Education. Collector's name of voucher is indicated by the abbreviation; SYN: D. Saindovdon, O. Yano, H. Nasu, and GH: Y. Gundegmaa, T. Hoshino.

List of Cyperaceae

1. Blysmus Panz. ex Schult.
   1) B. compressus (L.) Panz. ex Link subsp. brevifolius (Decne.) Kukkonen (Fig. 3A) [2, 4]
   **Habitat:** Sunny, open wet sandy place around small pool near the Kharaa river.
   **Voucher:** SYN. no. 1811013, 2 July 2018.

2. Carex L.
   1) C. amgunensis Fr.Schmidt [2]
   **Habitat:** Rocky, slope of mountain.
   **Voucher:** SYN no. 1811016, 3 July 2018.

   2) C. appendiculata (Trautv. & C.A.Mey.) Kük. (Fig. 3B) [2, 4]
   **Habitat:** Sunny, open grassland, near the railroad tracks.
   **Voucher:** GH nos. 1812030 & 1812031, 3 July 2018.

   3) C. arnellii Christ. (Fig. 3C) [2, 4]
   **Habitat:** Sunny, open grassland.
   **Voucher:** GH no. 1812039, 4 July 2018.

   4) C. atherodes Spreng. (Fig. 3D) [2, 4]
   **Habitat:** Sunny, open grassland, or wet place around small pool.
   **Voucher:** SYN nos. 181006 & 1811011, 2 July 2018; GH no.1812022, 3 July 2018; GH no.1812043, 4 July 2018.

   5) C. delicata C.B.Clarke (Fig. 3E) [2, 4]
   **Habitat:** Sunny, wet, roadside or open grassland.
   **Voucher:** SYN no. 1811012, 2 July 2018.

   6) C. duriuscula C.A.Mey. [2, 4]
   **Habitat:** Wet, side of the small stream.
   **Voucher:** GH nos. 1812004 & 1812008, 1 July 2018.

   7) C. enervis C.A.Mey. (Fig. 3F) [2, 4]
   **Habitat:** Sunny, wet, roadside or open grassland, or side of the small stream.
   **Voucher:** GH no. 1812005, 1 July 2018; GH no. 1812020 & 1812033, 3 July 2018.

   8) C. iljinii V.I.Krecz. (Fig. 3G) [2]
   **Habitat:** Sunny, open grassland.
   **Voucher:** GH nos. 1812036 & 1812045, 4 July 2018.
9) *Carex korshinskyi* Kom. (Fig. 3H) [2, 4]  
**Habitat:** Rocky, slope, or ridge near the summit, or wet, side of the small stream.  
**Voucher:** SYN nos. 1811015 & 1811017, 3 July 2018; GH nos. 1812003 & 1812007, 1 July 2018; GH nos. 1812009, 1812010, 1812011 & 1812015, 2 July 2018.

10) *Carex leporina* L. (Fig. 3I) [2]  
**Habitat:** Sunny, open grassland.  
**Voucher:** GH no. 1812037, 4 July 2018.  
**Note:** Less than 20 individuals were found in this place. Conservation status of this species is rare in Mongolia (Urgamal et al. 2014).

11) *Carex media* R. Br. (Fig. 4A) [2, 4]  
**Habitat:** Sunny, open grassland.  
**Voucher:** GH no. 1812040, 4 July 2018.

12) *Carex pamirica* (O.Fedtsch.) B.Fedtsch. subsp. *dichroa* (Freyn) T.V.Egorova (Fig. 4B) [2, 4]  
**Habitat:** Wet, side of the small stream or pool, or sunny, open grassland near the railroad tracks.  
**Voucher:** SYN no. 1811004, 2 July 2018; GH no. 1812006, 1 July 2018; GH nos. 1812023 & 1812032, 3 July 2018.
13) *C. pediformis* C.A.Mey. (Fig. 4C) [2, 4]  
**Habitat:** Rocky, slope, or ridge near the summit.  
**Voucher:** SYN no. 1811014, 3 July 2018; GH nos. 1812012, 1812013, 1812016, 1812017 & 1812018, 2 July 2018.

14) *C. rhynchophysa* C.A.Mey. (Fig. 4D) [2, 4]  
**Habitat:** Sunny, open grassland or wet place around small pool.  
**Voucher:** SYN no. 1811010, 2 July 2018; GH no. 1812024, 3 July 2018; GH no. 1812038, 4 July 2018.

15) *C. schmidtii* Meinsh. (Fig. 4E) [2, 4]  
**Habitat:** Wet, side of the small stream or pool, or sunny, open grassland.  
**Voucher:** SYN no. 1811007, 2 July 2018; GH no. 1812001, 1 July 2018; GH no. 1812025, 3 July 2018; GH no. 1812044, 4 July 2018.

16) *C. sedakowii* C.A.Mey. ex Meinsh. (Fig. 4F) [2, 4]  
**Habitat:** Sunny, open grassland.  
**Voucher:** GH no. 1812035, 4 July 2018.

1) *E. palustris* (L.) Roem. & Schult. [2, 4]  
**Habitat:** Sunny, wet place around small pool, or in small pool.  
**Voucher:** SYH nos. 1811002 & 1811009, 2 July 2018; GH nos. 1812021, 1812027 &
4. **Eriophorum** L.

1) **E. angustifolium** Honck. (Fig. 4G) [2, 4]

**Habitat:** Sunny, open grassland.

**Voucher:** GH no. 1812029, 3 July 2018; GH nos. 1812041 & 1812042, 4 July.

5. **Schoenoplectus** (Rchb.) Palla

1) **S. lacustris** (L.) Palla subsp. *hippolytii* (V.I.Krecz.) Kukkonen (Fig. 4H) [2, 4]

**Habitat:** Sunny, in small pool.

**Voucher:** SYN no. 1811005, 2 July 2018; GH no. 1812026, 3 July 2018.

6. **Scirpus** L.

1) **S. orientalis** Ohwi (Fig. 4I) [2, 4]

**Habitat:** Wet, side of the small stream.

**Voucher:** GH no. 1812002, 1 July 2018.

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**References**


