

Scientific data

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

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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 (Badamtsetseg 2015). In Mongolian Dauria region 10 genera and 55 species of Cyperaceae, 36 of which are *Carex*,

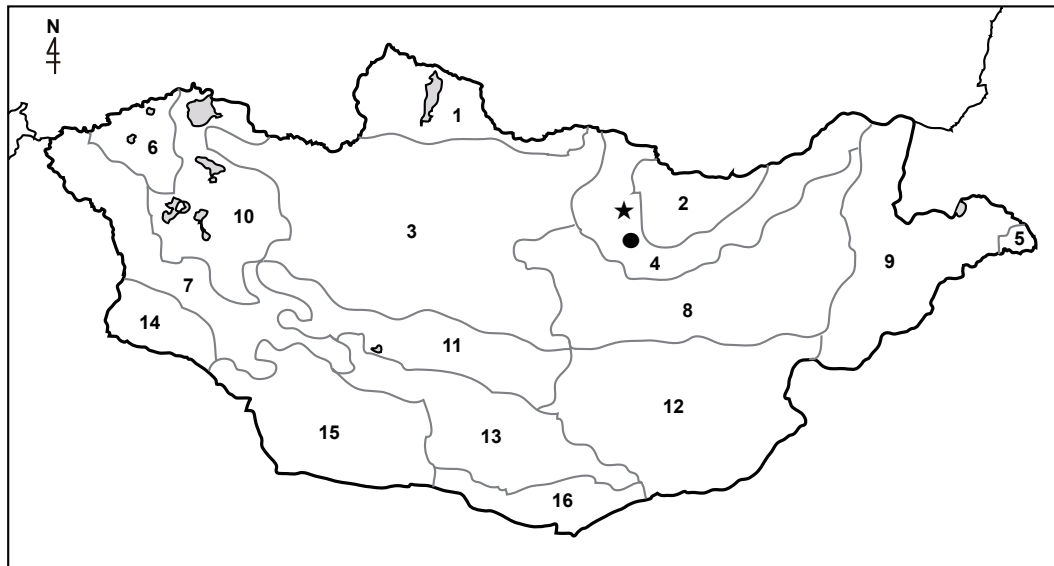


Fig. 1. Map of 16 botanico-geographic regions in Mongolia (after Grubov, 1982) and location of field research.

1: Khubsugul mountain taiga. 2: Khentei mountain taiga. 3: Khangai forest steppe. 4: Mongol-Daurian forest steppe. 5: Great Khinghan mountain meadow steppe. 6: Khobdo mountain semi-desert steppe. 7: Mongolian Altai mountain steppe. 8: Middle Khalkha dry steppe. 9: East Mongolia steppe. 10: Depressions of Great Lakes semi-desert steppe. 11: Valley of Lakes semi-desert steppe. 12: East Gobi semi-desert steppe. 13: Gobi-Altai mountain semi-desert steppe. 14: Dzungarian Gobi desert. 15: Transaltai Gobi desert. 16: Alaskan Gobi desert. Star mark and circle mark indicates the location of Shatan (★) and Ulaanbaatar (●), respectively.

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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, Dariimaa 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.



Fig. 2. Field sites in the Shatan area. A: Shatan valley from Tsogt Hairhan mountain. B: Grassland and the Kharaa river.

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: SYN no. 1811001, 2 July 2018; GH no. 1812005, 1 July 2018; GH nos. 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.

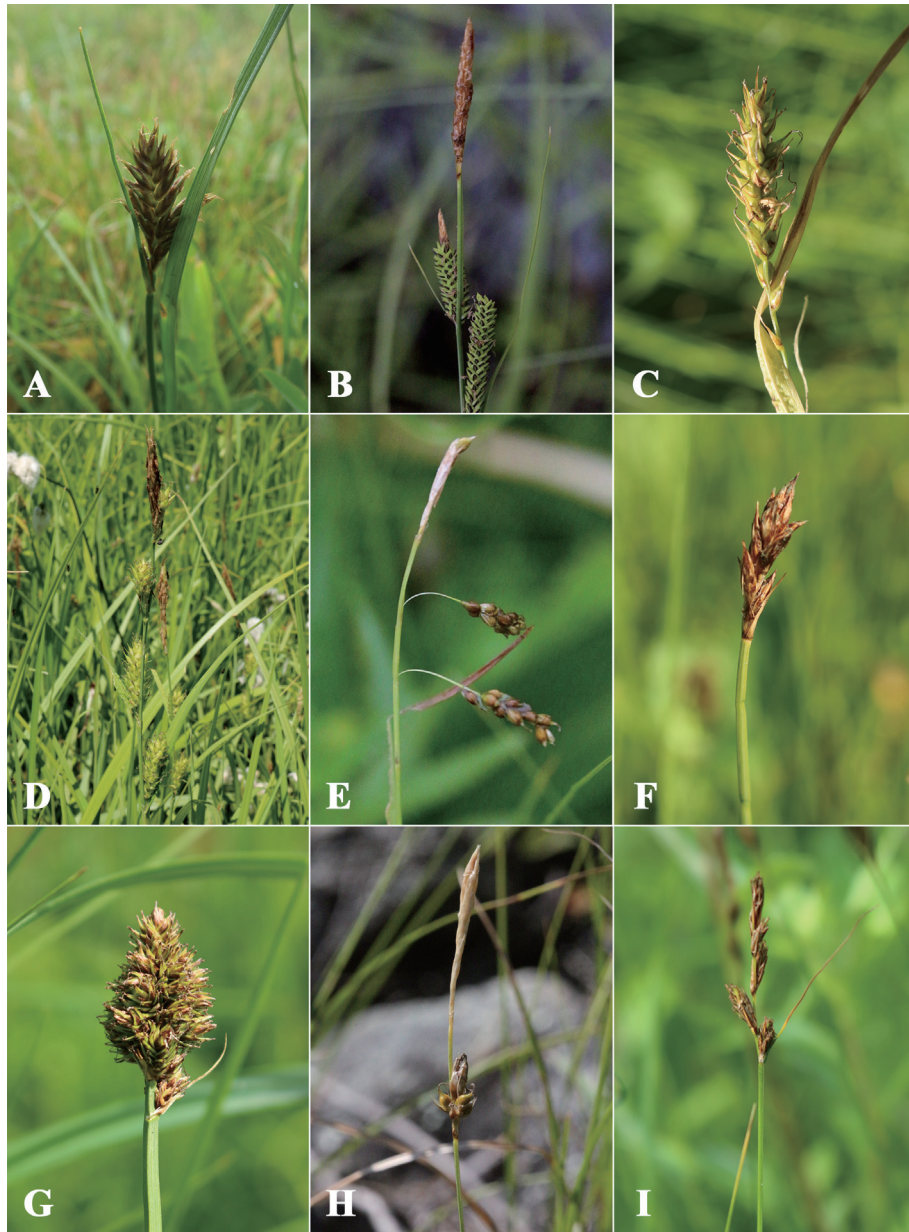


Fig. 3. Photograph of Cyperaceae from the Shatan. A: *Blysmus compressus* subsp. *brevifolius*. B: *Carex appendiculata*. C: *C. arnellii* (female parts). D: *C. atherodes*. E: *C. delicata*. F: *C. enervis*. G: *C. iljinii*. H: *C. korshinskyi*. I: *C. leporina*.

9) *C. 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) *C. 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) *C. media* R. Br. (Fig. 4A) [2, 4]

Habitat: Sunny, open grassland.

Voucher: GH no. 1812040, 4 July 2018.

12) *C. 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.

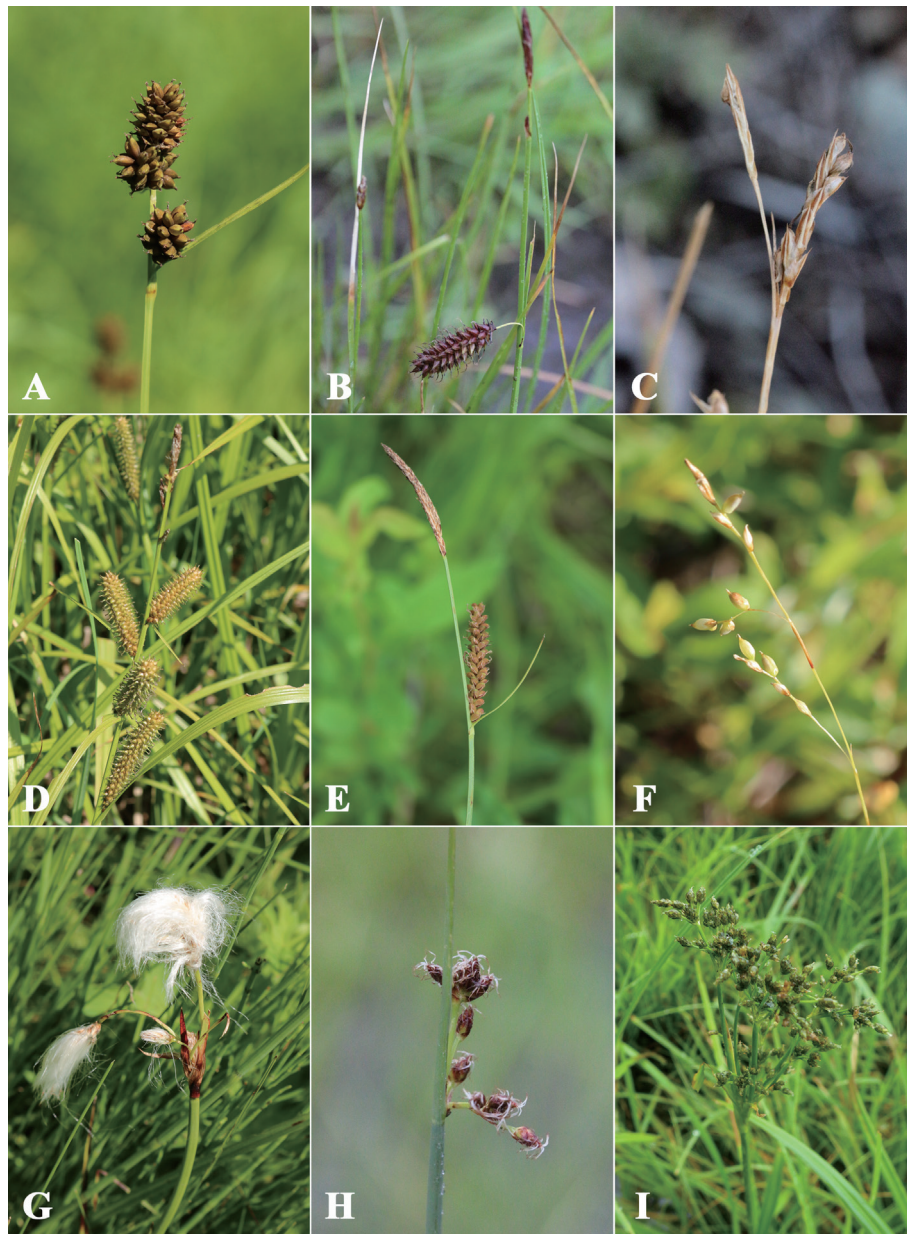


Fig. 4. Photograph of Cyperaceae from the Shatan. A: *Carex media*. B: *C. pamirica* subsp. *dichroa*. C: *C. pediformis*. D: *C. rhynchophysa*. E: *C. schmidtii*. F: *C. sedakowii*. G: *Eriophorum angustifolium*. H: *Schoenoplectus lacustris* subsp. *hippolytii*. I: *Scirpus orientalis*.

- 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.
3. *Eleocharis* R. Br.
 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 &

1812028, 3 July 2018.

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

- Badamtsetseg, B. (2015). Flora. In: Lee, S. J., Youn, M. R., Paik, I. H. (eds.) "Biodiversity of Shatan". pp. 6-18. National Science Museum of Korea, Daejeon.
- Dariimaa, Sh., Punsalpaamuu, G., Hongorzul, Ts., Bayanmunkh, T., Munkhzul, T., Gundegmaa, V., Tserennyam, J., Sindovdon, D. (2014). Common vascular plants in adjacent regions of Shatan. 194pp. Ulaanbaatar. (In Mongolian).
- Govaerts, R., Simpson, D.A., Bruhl, J., Egorova, T., Goetghebeur, P., Wilson, K. (2007). Word checklist of Cyperaceae. 780pp. Royal Botanic Gardens, Kew, London.
- Grubov, V. I. (1982). Key to the vascular plants of Mongolia (with an atlas). 442pp. Leningrad, Nauka. (in Russian).
- Nyambayar, D. (2009). Flora of Mongolia. Vol. 17. Cyperaceae. 137pp. "Bembi san" Press, Ulaanbaatar. (In Mongolian).
- Urgamal, M., Oyuntsetseg, B., Nyambayar, D., Dulamsuren, Ch. (2014). Conspectus of the vascular plants of Mongolia (Editors: Sanchir, Ch. and Jamsran, Ts.). 334pp. "Admon Printing" Press, Ulaanbaatar.

矢野興一・星野卓二・那須浩郎・Vanjil GUNDEGMAA・Davaadori SAINDOVDON・中本敦：モンゴル国における植物調査で採集されたカヤツリグサ科植物(1) トゥブ県シャタン地域

要約：モンゴル国トゥブ県シャタン地域は、首都ウランバートルから120km北に位置し、タイガ林と森林ステップに区分され、モンゴル国の中でも植物の多様性が高い地域の1つである。カヤツリグサ科植物は世界に約106属5400種があり、さまざま環境に生育しており(Govaerts et al. 2007)、モンゴル国のカヤツリグサ科は13属132種が知られている(Nyambayar 2009)。しかしながら、これまでにシャタン地域からは2種のカヤツリグサ科しか報告されていない。そこで筆者らは2018年7月1日から7月4日までの4日間、モンゴル国トゥブ県シャタン地域でカヤツリグサ科植物の調査・採集を行った。その結果、6属21分類群のカヤツリグサ科植物を採集し、そのうちスゲ属が16分類群と最も多かった。

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