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Lectotypification and correct name for *Neoscirpus dioicus* (Cyperaceae)

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As part of an ongoing project promoted by the Korea National Arboretum, aimed at tracing the original materials used to describe vascular plant taxa in Korea, we detected problems with the typification of *Neoscirpus dioicus* Y.N.Lee & Y.C.Oh (2006b: 25) and some nomenclatural issues related to that name.

Neoscirpus dioicus, a well-known taxon among the diversity of calciphytes occurring on the Korean peninsula, is an endemic sedge occurring in limestone areas of the Gangwon-do Province, Republic of Korea (Lee & Oh 2006b, Chung *et al.* 2017, WCSP 2018). This species was originally described as *Scirpus dioicus* Y.N.Lee & Y.C.Oh (2006a: 614) on the basis of a single collection (*Y.N.Lee & Y.S.Kim s.n.*) cited in the protologue, which was gathered from the Donggang river, Jeongseon-gun in Gangwon-do Province, Republic of Korea. Later, the species was transferred to a monotypic genus, *Neoscirpus* Y.N.Lee & Y.C.Oh (2006b: 24), which was established based on the characteristics of this dioecious sedge, under the name *N. dioicus*.

Recent molecular phylogenetic studies (e.g., Muasya *et al.* 2009, Jung & Choi 2010b, 2011a, 2011b) supported that *Scirpus* Linnaeus (1753: 47) sensu lato was best segregated into several genera which were previously established on morphological data (with the exception of *Schoenoplectiella* Lye (2003: 20) which was established based on the molecular phylogenetic work of Muasya *et al.* (1998)). Morphologically, *Scirpus dioicus* shares a higher degree of synapomorphy with *Trichophorum* Persoon (1805: 69) than that with other species of *Scirpus* L. s. str. (Jung & Choi 2010a). In addition to these morphological similarities, its plastid *rbcL* gene and nuclear ITS sequences display greater similarity to members of the genus *Trichophorum* (Jung & Choi 2010a); thereby, as both from a monophyletic group, it was suggested that the species should be transferred to *Trichophorum* (Jung & Choi 2010b, 2011a, 2011b).

Meanwhile, Jung & Choi (2010a) argued that the name *S. dioicus* was invalidly published under Art. 37.7 of the *Vienna Code* (McNeill *et al.* 2006), because the type was not specified; similarly, the generic name *Neoscirpus* was also considered to be invalidly published, as Lee & Oh (2006b) did not specify type and the name was established from the invalid name *S. dioicus* Y.N.Lee & Y.C.Oh. Hence, the latter authors published *Trichophorum dioicum* J.Jung & H.K.Choi (2010a: 289), as a new species name, including *S. dioicus* and *N. dioicus* in synonymy, both as intended invalid names under Art. 58.1 of the *International Code of Nomenclature for algae, fungi, and plants* (ICN, Turland *et al.* 2018).

However, the protologue of *S. dioicus* includes the type statement: "Donggang, Gangwon-do, Korea, April 5, 2006, *Lee Yong No & Kim You Sung*, Kor. Pl. Res. Inst., Seoul, Korea" (Korea Plant Research Institute, KPRI), and such type does really exist. Furthermore, the name *S. dioicus* can be considered homonymous with *S. dioecus* (Kunth) Boeckeler (1870: 719), which occurs in Southern Africa, and the former should therefore be considered illegitimate (Art. 53.1 & Art. 53.2 Ex. 10 of the ICN). In contrast, the name *N. dioicus* is legitimate, because it does not contravene ICN rules. Thus, it should be treated as a replacement name for *S. dioicus* Y.N.Lee & Y.C.Oh to be cited as *N. dioicus* Y.N.Lee & Y.C.Oh (not as "*N. dioicus* (Y.N.Lee & Y.C.Oh) Y.N.Lee & Y.C.Oh"), automatically typified by the type of the replaced synonym (Art. 7.5 of the ICN), and it has priority from that date (Art 58.1 of the ICN). Furthermore, and most critically, *T. dioicum* J.Jung & H.K.Choi is illegitimate and superfluous when it's published, as Jung & Choi (2010a) cited in synonymy *S. dioicus* and *N. dioicus* as "nom. inval."; whereby, the former name is indeed illegitimate as a later homonym (Arts. 53.1 & 53.2 of the ICN), while the latter is a legitimate name at the same rank (Art. 52.1 of the ICN). Additionally, when Jung & Choi (2010a) described *T. dioicum* as a new taxon, they did not exclude the type of *N. dioicus*, citing it among other paratypes, which makes it illegitimate (Art. 58.1 Note 1. of the ICN). Therefore, based on the information discussed above, we accept the name *Trichophorum dioicum* (Y.N.Lee & Y.C.Oh) M.Kim (2017: 392), based on *N. dioicus* as the correct, legitimate name of the concerned species.

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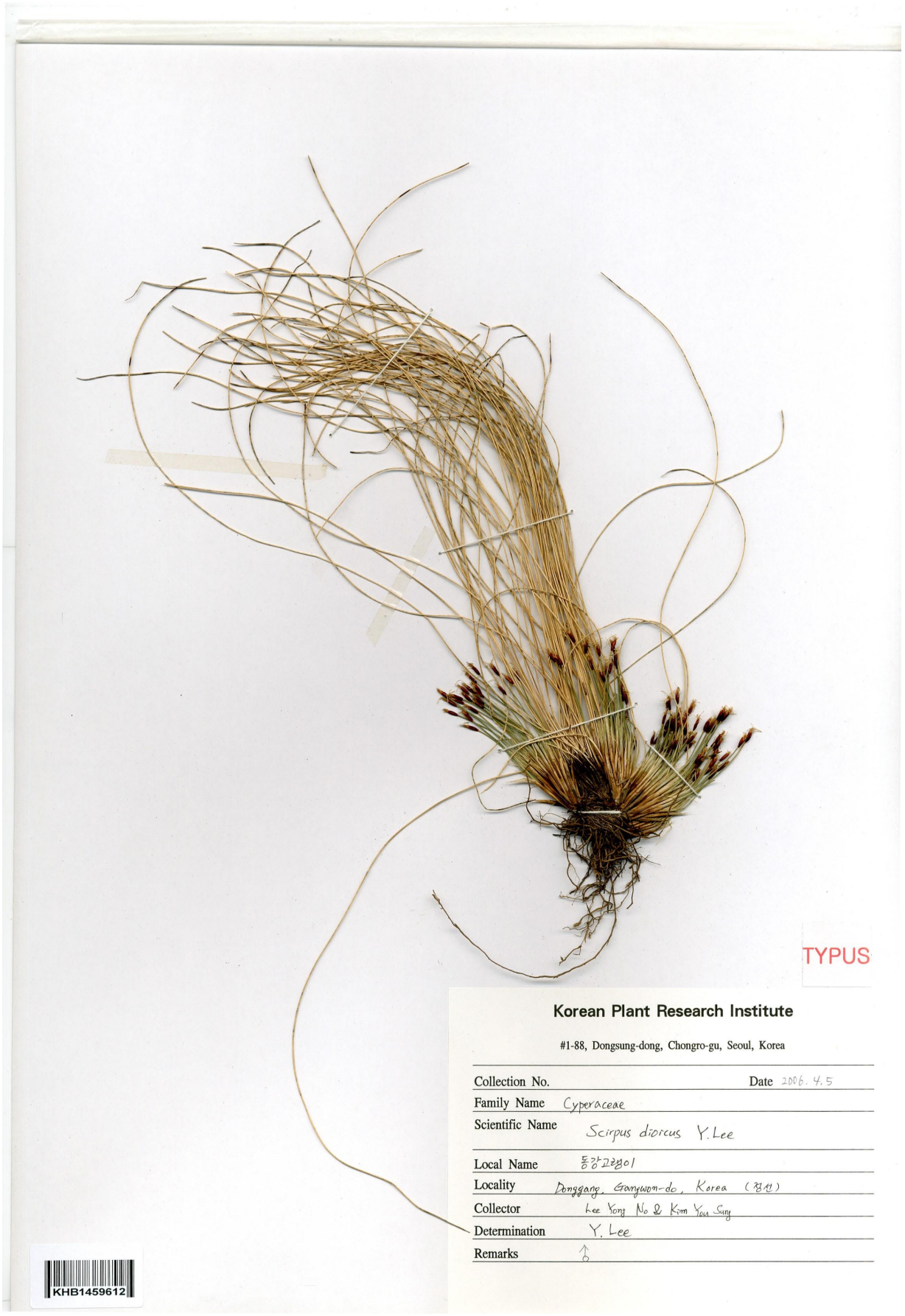

FIGURE 1. Lectotype of *Trichophorum dioicum* (Y.N.Lee & Y.C.Oh) M.Kim (*Y.N.Lee & Y.S.Kim s.n.*, 5 April 2006, KHB-1459612).

FIGURE 2. Isolectotype of *Trichophorum dioicum* (Y.N.Lee & Y.C.Oh) M.Kim (*Y.N.Lee & Y.S.Kim s.n.*, 5 April 2006, KHB-1459613).

Regarding typification of *N. dioicus*, Lee & Oh (2006b) mentioned that its type (*Y.N.Lee & Y.S.Kim s.n.*) was conserved in Dr. Lee's personal herbarium (Korea Plant Research Institute, KPRI). After Dr. Lee passed away 22 June 2008, all specimens including types at KPRI were donated by his family to the National Institute of Biological Resources (KB; herbarium acronyms according to Thiers 2018+) on 2 June 2009 (Son *et al.* 2016). On that basis, after examining herbarium specimens of KB, we found three specimens (NIBRVP0000187061!, NIBRVP0000187062!, and NIBRVP0000187063!) of that taxon which is being classified as type collection. Unfortunately, all the above specimens should however not be regarded as type material of *N. dioicus*, because, although collection date perfectly matches the protologue, the collection site is dubiously annotated as no detailed on the label, and additionally the number of collectors does not match the protologue (*Y.N.Lee* for label vs. *Y.N.Lee & Y.S.Kim* for protologue). However, there are currently two sheets at the Korea National Arboretum (KH) fitting the protologue that could belong to the type collection mentioned (*Y.N.Lee & Y.S.Kim s.n.*), with different barcode numbers (KHB-1459612!, KHB-1459613!). Those sheets at KH were donated by late Dr. Lee, Y.N. in his living years (KH General director Dr. Lee, Y.M., pers. comm.). Consequently, those duplicates at KH are to be considered as syntypes (Art. 9.6 of the ICN), and three sheets at KB might be the original materials of *N. dioicus*.

Therefore, and according to Art. 9.12 of the ICN, the sheet KHB-1459612 (Fig. 1) is selected here as lectotype of *N. dioicus*. It has the label affixed from Dr. Lee's personal herbarium (KPRI); it is not in conflict with the protologue, and it matches the current application of that name. The selected sheet bears a complete and well-preserved specimen that displays all the diagnostic morphological features needed for the identification of the species, such as polygamous, caespitose and rhizomatous, ligulate leaves, a reduced leaf blade, a single ovate-elliptic spikelet at the culm terminus, and short perianth bristles (Lee & Oh 2006a, 2006b, Jung & Choi 2010a, Park *et al.* 2016, Kim 2017). Any other specimen gathered by Yong No Lee & You Sung Kim in the Donggang river, wherever conserved, must be considered as isolectotype (footnote of Art. 9.4 of the ICN).

Typification

Trichophorum dioicum (Y.N.Lee & Y.C.Oh) M.Kim (2017: 392)

Replaced synonym:—*Neoscirpus dioicus* Y.N.Lee & Y.C.Oh (2006b: 25)

Type:—**KOREA**. Gangwon-do, Jeongseon-gun, Donggang river, 5 April 2006, *Y.N.Lee & Y.S.Kim s.n.* (**lectotype, designated here**: KHB-1459612!, Fig. 1; iso- KHB-1459613!, Fig. 2)

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