



Effective typification of *Galium verum* var. *hallaensis*, a replacement name for the Korean *G. pusillum* (Rubiaceae)

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The genus *Galium* Linnaeus (1753: 105), a well-known member of the madder family, consists of around 650 perennial and annual herbaceous species widely distributed in temperate, subtropical, and tropical regions worldwide (Ehrendorfer *et al.* 2005, Chen & Ehrendorfer 2011). This genus is distinguished from other genera belonging to Rubiaceae by several morphological characteristics including the leaves in whorls of 2–8, 3 or 4-lobed corollas, rudimentary corolla tubes, and dry mericarps (Yamazaki 1993, Ehrendorfer *et al.* 2014, Elkordy & Schanzer 2015).

Article 9.23 of the Shenzhen Code (Turland *et al.* 2018) requires that “on or after 1 January 2001, lectotypification, neotypification, or epitypification of a name of a species or infraspecific taxon is not effected unless indicated by use of the term “lectotypus”, “neotypus”, or “epitypus”, its abbreviation, or its equivalent in a modern language,” and Art. 7.11 requires that “... designation of a type is achieved only..., on or after 1 January 2001, if the typification statement includes the phrase “designated here” (*hic designatus*) or an equivalent.” However, in many monographic and taxonomic works published on or after 1 January 2001, the requirements of Art. 7.11 and 9.23 were not met, and this may yet happen in the future (Singh 2016).

The name *Galium verum* Linnaeus (1753: 107) var. *hallaensis* K.S. Jeong & K. Choi (2017: 95) was proposed by Jeong *et al.* (2017) as a replacement name for *G. pusillum* Nakai (1915: 4), primarily because the name *G. pusillum* is a later homonym of *G. pusillum* Linnaeus (1753: 106) which is found in Europe, and is therefore illegitimate under Art. 53.1 of the ICN (Turland *et al.* 2018). This species is restrictedly distributed in Mt. Halla of Jeju Island as endemic to Korea, and it is broadly similar to *G. verum* Linnaeus (1753: 107) var. *asiaticum* Nakai (1939: 344) that is distributed in Japan, Korea, and Russia (Yamazaki 1991, Chen & Ehrendorfer 2011). However, this species differs from latter by its smaller-sized plant and leaves (Jeong *et al.* 2017).

Regarding the typification of that name, Jeong *et al.* (2017) cited the type of replacement name *G. verum* var. *hallaensis* for *G. pusillum* in their taxonomic work as «Type:—KOREA. Jeju: Seogwipo-si, Mt. Halla, 13 August 1908, *E.J. Taquet 921* (holotype TI!)». However, when Nakai (1915) described this species, he cited several gatherings (*T. Mori 112*, *T. Mori 137*, *U.J. Faurie 1861*, *E.J. Taquet 921*, and *E.J. Taquet 5747*) in the protologue but did not cite a specific individual specimen. In addition, the collection *E.J. Taquet 921* should not be regarded as a holotype of *G. verum* var. *hallaensis*. Those collections are to be considered as syntypes (Art. 9.6 of the ICN); hence, a lectotype may be designated (Art. 9.12 of the ICN). Furthermore, this citation of a “holotype” cannot be corrected to a designation of a lectotype (Art. 9.10 of the ICN), because they did not use the phrase “designated here” or an equivalent (Art. 7.11 of the ICN) in their associated statement. Consequently, their typification for the name *G. verum* var. *hallaensis* was not effective (Art. 9.23 of the ICN).

Therefore, based on the information discussed before, we designate below the specimen *E.J. Taquet 921* stored at TI, by indicating the phrase «designated here» in the typification statement. 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 glabrous vegetative parts, creeping stems, 6–8 linear whorled leaves, and a 4-lobed yellowish corolla (Nakai 1915, Jeong *et al.* 2017).

Taxonomy Treatment

Galium verum var. *hallaensis* K.S. Jeong & K. Choi (2017: 95)

Replaced synonym: *Galium pusillum* Nakai (1915: 4), nom. illeg., non *G. pusillum* Linnaeus (1753: 106).

Related name: *Galium verum* var. *asiaticum* f. *pusillum* M. Park (1974: 441), nom. inval. nom. nud.

Galium verum var. *hallasanense* M. Kim (2017: 312), nom. illeg. later homonym.

Type—**KOREA**. Quelpaert in herbidis Hallaisan 1500 m [currently Jeju-do: Seogwipo-si, Mt. Halla], 13 August 1908, *E.J. Taquet 921* (**lectotype, designated here: TI!** [no barcode number, Fig. 1]; **isolectotype: E!** [E-00327931!]); 濟州島漢拏山頂 [currently Jeju-do: Mt. Halla summit], 13 August 1911, *T. Mori 112* (syntype: TI! [1 sheet, no barcode number]); 濟州島 (in sepibus) [currently Jeju-do: Mt. Halla], August 1911, *T. Mori 137* (syntype: TI! [1 sheet, no barcode number]); in herbidis Hallaisan 2000 m [currently Jeju-do: Seogwipo-si, Mt. Halla], July 1907, *U.J. Faurie 1861* (syntype: TI! [1 sheet, no barcode number]; isosyntype: E! [E-00327932!]); 濟州島 [currently Jeju-do: Mt. Halla], 13 July 1907, *U.J. Faurie 1861* (isosyntype: KYO! [1 sheet, no barcode number]); Quelpaert in herbidis Hallaisan 1700 m [currently Jeju-do: Seogwipo-si, Mt. Halla], 25 August 1911, *E.J. Taquet 5747* (syntype: TI! [1 sheet, no barcode number]; isosyntype E! [E-00327933!]).



FIGURE 1. Lectotype of *Galium verum* var. *hallaensis* K.S. Jeong & K. Choi (*E.J. Taquet 921*, 13 August 1908, TI).

Note: *Galium verum* Linnaeus (1753: 107), also known as Lady's Bedstraw, is a very variable species and several infra-species on the basis of habit, indumentum type, and corolla color have been recognized (Cufodontis 1940,

Yamazaki 1991, Chen & Ehrendorfer 2011). Taxonomic position of *G. pusillum* as infraspecific taxa within *G. verum* is also supported by morphological and molecular evidences (Jeong & Pak 2012, Jeong *et al.* 2016). Meanwhile, *G. pusillum* Nakai has been treated as *Galium verum* var. *asiaticum* f. *pusillum* (Nakai) M. Park (1974: 441) and subsequently both names are recognized in the most Korean literature and reference (Lee 1980, Lee 1996a, 1996b, Jeong & Pak 2012, Jeong *et al.* 2016). However, former name is illegitimate as later homonym and latter is not validly published by Park (1974) because when proposing new combination, he cited the doubtful basionym as *G. verum* var. *pusillum* Nakai without indicated its a full and direct reference; whereby, these errors of basionym should be corrected to a *G. pusillum* (Art. 41.5 & 41.6 of ICN), then that name was not only considered nomenclatural novelty as new name, but also it cited as *Galium verum* var. *asiaticum* f. *pusillum* M. Park, not *Galium verum* var. *asiaticum* f. *pusillum* “(Nakai) M. Park”. Nevertheless, it was published without a description or diagnosis; therefore, the name *Galium verum* var. *asiaticum* f. *pusillum* M. Park is invalidly published name as a nomen nudum. In addition, *G. verum* var. *hallasanense* M. Kim (2017: 312) based on different types also is not available for use. Both the epithet ‘*hallaensis*’ and ‘*hallasanense*’ are sufficiently alike to be considered homonymous, and are derived from Mt. Halla of Jeju Island, Republic of Korea as well as ‘*hallasanense*’ has not the priority over the former name; whereby, the latter is illegitimate (Art. 53.1 & 53.2 Ex. 10 of the ICN).

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