

## Epitypification of *Carex vulpina* L. (Cyperaceae)

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### ABSTRACT

The designated lectotype of *Carex vulpina* is an immature plant, misleading in respect to the correct application of the name, since important taxonomic characters are undeveloped. Also, the specimen is found to be partly in conflict with the protologue. Other elements cited by Linnaeus have been examined but fail to clarify the application. To assist in this, an epitype is designated.

KEYWORDS: *Carex otrubae* Podp., epitype, lectotype, Linnaeus, nomenclature, protologue.

### INTRODUCTION

*Carex vulpina* L. was originally described in *Species plantarum* (Linnaeus 1753) with the diagnosis “*Carex spica supradecomposita inferne laxiore: spiculis androgynis ovatis sessilibus glomeratis: superne masculis*”, i.e. a species of *Carex* with the spike very many times [decompoundly] divided, laxer below: spikelets androgynous, ovate, sessile, collected close together in a head, male above.

In the Linnaean herbarium (LINN) there is a sheet (1100.22) bearing part of a plant, which comprises a single inflorescence and upper culm but lacks leaves, ligules, lower culm and rhizome and roots. The sheet is annotated in Linnaeus’s hand “7 *vulpina*”, the “7” equating to his species number in *Species plantarum*. At the end of his protologue, Linnaeus stated that the plant occurred in Europe in “*paludibus nemorosis*” (wooded marshes). This specimen was selected as the lectotype by Nelmes (1939) and recently accepted as such on photographic evidence by Egorova (1999) but is difficult to reconcile with the current concept and usage of *C. vulpina* and could even be of another taxon. Indeed, Nelmes himself (Nelmes 1939) noted that the lectotype and diagnosis were in some conflict. Despite this, there appears to have been no subsequent discussion regarding his designation.

About 50 years after Linnaeus’ publication, Rebutisch (1804) described a new species, *Carex nemorosa* Rebut. However, for long afterwards that name was only applied at infraspecific rank to plants with an interrupted,

long-bracteate inflorescence, common in western and southern Europe and not thought to be specifically distinct from the rarer *C. vulpina*. The latter has a more compact inflorescence with only a few short or vestigial bracts (Hess *et al.* 1967; Schultze-Motel 1968; Chater 1980; Stace 1991; Egorova, 1999).

Eventually however, Haussknecht (1877), who knew *Carex vulpina*, essentially a plant of eastern and northern Eurasian distribution, progressively less frequent to the west and largely replaced there by the commoner *C. nemorosa* of Rebutisch, recognised the latter at specific rank. Despite this, it was only following the work of Nelmes (1939) that its existence as a separate species was more widely acknowledged. The western taxon was now accepted as such, but under the later-published name of *Carex otrubae* Podp. (Podpěra 1922) since the name *Carex nemorosa* Schrank had been previously validly published (Schrank 1789) for a different species of *Carex*.

### CHARACTERS USEFUL IN DISTINGUISHING *C. VULPINA* FROM *C. OTRUBAE*

*Carex otrubae*, principally a western European and Mediterranean plant, occurs eastwards to the Middle East, whereas *C. vulpina* is rare in western Europe but much more frequent to the east, especially in Russia and western Asia and as far east as the Altai. As both species occupy the same type of wet, sometimes shaded habitat such as ditch margins and other marshy ground, their identities have often been confused and, in western continental Europe and the British Isles, this has resulted in many erroneous records for *C. vulpina*. Both species can be remarkably similar in general facies although *C. otrubae* is often less robust and this close morphological similarity is reflected in recent molecular work by Hendrichs *et al.* (2004) who were unable to separate the two species by ITS sequence data. Stature and the presence of a large, more or less wedge-shaped inflorescence with few, short bracts superficially points to *C. vulpina* – but this is not always the case so that sole dependence on these characters is not

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reliable. Foley & Porter (1999), after a field study of several British populations of *C. vulpina* together with an examination of a large amount of herbarium material, concluded that the most reliable diagnostic character for distinguishing *C. vulpina* from *C. otrubae* was that originally observed by Samuelsson (1922). This is the presence of more or less papillose, isodiametrically shaped cells on the surface of the adaxial (and often abaxial) side of the usually somewhat smaller, differently shaped, less ridged utricles, as opposed to the non-papillose, elongated-rectangular cells of the larger, distinctly ridged utricles of *C. otrubae*. This cell character is clearly illustrated in Hess *et al.* (1967). In addition, *C. vulpina* differs in having shorter, often almost inconspicuous bracts, an excess of scarious, papery tissue around the ligule and the leaf sheaths (the sheaths themselves often whiter, thinner and more readily split), a shorter, more truncate ligule, and a much earlier time of flowering and fruiting.

Of these characters, the nature and shape of the cells on the surface of the utricles of *Carex vulpina* is considered to be diagnostic (best seen at  $\times 100+$  magnification) but in the field, in the absence of any ability to determine this, other characters may be collectively taken into account in order to help in identification. However, in preserved material it is often difficult or even impossible to confirm ligule size and shape whilst, by its very friable nature, any excess scarious tissue around the ligule and leaf sheath may be lost. Additionally, the time of flowering and fruit maturity is often unrecorded. In such cases, identifications relying on utricle size and general plant appearance may lead to errors.

Recently, other criteria for separating the two species, including the comparison of isozymes, the shape of leaf stomata, and the surface characters of the nutlets, have been reported by Smith and Ashton (2006).

#### LINNAEUS' SPECIMEN IN HERB. LINN

As stated above, the specimen (LINN 1100.22), selected by Nelmes (1939) as lectotype, comprises just a single stem and inflorescence and is of an immature plant. The inflorescence is very dense consisting mainly of an agglomerated mass of developing glumes and exserted, but undehisced anthers, with no evidence of maturing fruits (utricles). Due to the lack of the latter and also of other subsidiary characters such as ligules, leaf

sheaths, etc., it is not possible to unequivocally identify the specimen as falling within current usage of *Carex vulpina* and it could, even possibly, be another taxon. In his selection of this specimen as the lectotype, Nelmes (1939) implied doubts as to its suitability stating: "The [diagnostic] phrase 'inferne laxiore' does not fit the specimen in the Linnaean herbarium....", thereby recognising conflict with the protologue. In addition, the inflorescence is not many times divided ("*spica supradecomposita*") and, due to its immaturity, it is also not possible to confirm Linnaeus's statement: 'spikelets androgynous, ovate, sessile, collected closely in a head with male above'.

The shortcomings of this specimen in fixing the correct application of the name *Carex vulpina* and also in its exhibiting some conflict with the protologue, has led to an examination of the additional elements cited by Linnaeus in order to ascertain whether any of these assist in clarifying the situation. They are discussed below.

#### CITED ELEMENTS

The full protologue of *Carex vulpina* L. reads as follows:

CAREX spica supradecomposita inferne laxiore: spiculis androgynis ovatis sessilibus glomeratis: superne masculis. *Hort. cliff.* 438. *Fl. suec.* 750. *Dalib.* [Dalibard] *paris.* 286. *Roy.* [van Royen] *lugdb.* 74. *Gmel.* [Gmelin] *sib.* 1. p.146. t. 32.

*Carex palustris* major, radice fibrosa, caule exquisite triangulari, spica brevi habitiore compacta. *Mich.* [Micheli] *gen.* 69. t. 33. f. 13. 14.

Gramen Cyperoides palustre majus, spica compacta. *Bauh.* [Bauhin] *pin.* 6. *Moris.* [Morison] *hist.* 3. p. 244 s. 8. t. 12. f. 14.

In *Hortus Cliffortianus*, Linnaeus (1738) based his description of "*Carex spica supradecomposita, spiculis androgynis...*" on a specimen now in **BM** (herb. Clifford, no. 438) but this is *Carex arenaria* L. (cf. Nelmes 1939).

The description in *Flora Suecica* (Linnaeus 1745) is presumably based on Swedish material. However, the specimen in the Stockholm herbarium (**S LINN**) numbered "7" (the *Species plantarum* number) was collected by Loeffling in Spain (i.e. post-1745), Linnaeus noting on the reverse of the sheet:

“Hispania 662.6. Loeffl.”. An image of this specimen has been examined but appears to be of an immature plant (confirmed as such by the curator of **S**) and in consequence lacks the developed utricles necessary for certain identification.

The specimens upon which Dalibard (1749) in *Florae Parisiensis* based his description would not have been seen by Linnaeus and are therefore irrelevant for this purpose. Also, it has also not been possible to trace appropriate material in **L** relating to *Florae Leydensis prodromus* (van Royen 1740).

Gmelin’s plate (Gmelin 1747–1749, t. 32) could have iconotypic potential but is of an immature plant very similar to **LINN** 1100.22. It could even be from the same collection since Gmelin was known to be in correspondence with Linnaeus and to send him material. Even if the specimen on which it is based is still available, because of its immaturity it is unlikely to confirm the illustration as being of *Carex vulpina* and, in any case, for similar reasons as the **LINN** specimen, is in some conflict with the protologue and current usage.

Examination of the two illustrations cited in *Nova plantarum genera* (Micheli 1729, t. 33, f. 13 & f. 14) shows f. 14 to be the closer in general facies to Linnaeus’ protologue and to the plant currently accepted as *Carex vulpina*, with the other illustration (f. 13) most definitely less so. In referring to the former (f. 14), the author (Micheli 1729) stated that he received relevant material from William Sherard: “Londino a D. Sherardo missa...”. In the Florence herbarium (**FI**) [where Micheli’s material is held] there are no specimens referred to *C. vulpina* which have a documented link to Sherard but there is one which bears a Petiver label. These two men exchanged specimens and were close associates, Petiver describing Sherard as “my worthy Friend and Kinsman”. However, examination of the utricles of one of these (specimen 17276 in Herb. Micheli at **FI**) showed it to be referable to *C. otrubae* but, in any case, it is not necessarily the plant illustrated.

The 17th century herbarium of Joachim Burser is now at Uppsala, Sweden (**UPS**); here the specimens were arranged and named by Burser in accordance with Bauhin’s *Pinax* (Bauhin 1623) and are known to have been consulted by Linnaeus. Bauhin’s name “*Gramen Cyperoides palustre majus spica compacta*”, cited in Linnaeus’ protologue, is repeated on a sheet (herb. Burser 1: 78 (**UPS**);

microfiche IDC 1064-1, 78!) containing a specimen with an elongate, lax inflorescence. It is very doubtful, however, that this is *C. vulpina* as currently understood.

Finally, there is the plate in *Plantarum historiae universalis* (Morison 1699, s. 8, t. 12, f. 24 [not “f. 14” as cited by Linnaeus]). In this illustration the long bracts depicted at the base of the spikelets are inconsistent with *C. vulpina* and it almost certainly represents *C. otrubae*.

#### CONCLUSION

The currently designated lectotype (**LINN** 1100.22) of *Carex vulpina* (Nelmes 1939) has been found to be in some conflict with the protologue, but not seriously so. An examination of Linnaeus’ cited elements has also shown evidence of some conflict and, in addition, a failure to comply closely with current usage. Despite this, under rules of the *International Code of Botanical Nomenclature* (Greuter *et al.* 2000), it is not possible for the lectotype to be superseded, since in order to be so, it has to be “in serious conflict with the protologue” (Article 9.17(b)). However, the lectotype is a very immature specimen in which important taxonomic characters are undeveloped and is misleading in respect to the correct application of the name. Therefore, in order to fix this application effectively, an interpretative epitype, which conforms closely to current usage, is here designated:

***Carex vulpina* L. Epitypus (hic designatus):** [England] E. Gloucs., v.c. 33, near Haw Bridge, 15 June 2004, *M. J. Y. Foley 2020* (**BM**; duplicates: **E**, **FI**, **G**, **LANC**).

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