

SHORT COMMUNICATION

Carex × *helenae* hybr. nov. [= *Carex demissa* × *C. oederi*, Cyperaceae], in the Netherlands

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Key words

Carex × *helenae*
Carex section *Ceratocystis*
Carex demissa
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Netherlands

Abstract – The genus *Carex* (Cyperaceae) counts over thirty hybrids in the Netherlands, of which the hybrid of *Carex demissa* and *C. oederi* is the only one as yet within the hybrids of *Carex* section *Ceratocystis* occurring in the Netherlands without a binomial name. Therefore, this hybrid has been provided here with the name *Carex* × *helenae* and its holotype has been selected as well. Where both parental species grow together, the hybrid can often be found as well. In all its features it is intermediate to the parents.

Samenvatting – Het geslacht *Carex* (Cyperaceae) telt in Nederland ruim dertig hybriden, waarvan de hybride van *Carex demissa* en *C. oederi* de enige is in *Carex* sectie *Ceratocystis* in Nederland waarvan een binaire naam nog ontbreekt. Daarom wordt deze hybride hier van de naam *Carex* × *helenae* voorzien; tevens wordt een holotype aangewezen. Waar beide oudersoorten samengroeien is de hybride dikwijls te vinden. De hybride is in al zijn kenmerken intermediair aan de beide ouders.

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INTRODUCTION

The genus *Carex* L. (Cyperaceae) counts worldwide around 2000 species (Govaerts et al., continuously updated), of which 225 occur in Europe (Koopman 2015) and around 60 in the Netherlands (Duistermaat 2020). Besides, Koopman (2015) mentioned 295 *Carex* hybrids for Europe. Kern & Reichgelt (1954) mentioned 15 hybrids for the Netherlands, Koopman (2010) 28, and currently there are 34 *Carex* hybrids known from the Netherlands (Koopman et al., in prep.). Systematic floristic research by FLORON since 1988, waarneming.nl, and an overview article of all the *Carex* hybrids occurring in the Netherlands (Koopman 2010) have alerted Dutch botanists, and several new *Carex* hybrids have been added to the list in the last ten years. Also the recent articles about three notoriously difficult *Carex* sections, *Ammoglochin* Dumort. (Koopman & Więclaw 2016),

Phaestoglochin Dumort. (Koopman & Więclaw 2017), and *Ceratocystis* Dumort. (Koopman & Więclaw 2019), in which the authors revised all the available material of these sections in the herbarium of Naturalis Biodiversity Center in Leiden (L), may have contributed to a better eye for *Carex* hybrids.

Koopman & Więclaw (2019) mentioned five species within *Carex* section *Ceratocystis* for the Netherlands: *Carex demissa* Hornem., *C. flava* L., *C. hostiana* DC., *C. lepidocarpa* Tausch, and *C. oederi* Retz. Theoretically, these five species can generate ten hybrids following the formula $5 \times 4/2 = 10$, and all these ten hybrids do occur in Europe. Six of them are also known from the Netherlands: *Carex* × *alsatica* Zahn [*C. demissa* × *C. flava*], *C. × fulva* Gooden. [*C. demissa* × *C. hostiana*], *C. × pauliana* F.W. Schultz [*C. hostiana* × *C. oederi*], *C. × ruedtii* Kneuck. [*C. flava* × *C. lepidocarpa*], *C. × xanthocarpa* Degl. [*C. flava* × *C. hostiana*], and *C. demissa* × *C. oederi* (Koopman & Więclaw 2019).

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Koopman (2015) mentioned another 18 hybrids resulting from crosses of members of section *Ceratocystis* with members of other *Carex* sections, but hitherto none of these has been found in the Netherlands.

The nomenclature in this paper follows Koopman (2015), except for *Carex oederi* (syn.: *C. viridula* Michx.), for which Hedrén (2002) is used as reference.

CAREX DEMISSA HORNEM. × C. OEDERI RETZ.

Within *Carex* section *Ceratocystis*, only the hybrid *C. demissa* × *C. oederi* still lacks a binomial name and it is also the only *Carex* hybrid in the Netherlands without a binomial name. Recently, *C. acuta* L. × *C. aquatilis* Wahlenb. and *C. acuta* × *C. trinervis* Degl. have been provided with binomial names, namely *C. × reichgeltii* Jac. Koopman, Więclaw & Waltje and *C. × terschellingensis* Jac. Koopman, Więclaw & Waltje respectively (Koopman et al. 2021). We therefore provide *C. demissa* × *C. oederi* here with a binomial name as well:

***Carex × helenae* Jac. Koopman, Beusekom & Waltje**, hybr. nov. [= *Carex demissa* Hornem. × *C. oederi* Retz.] — Fig. 1

Type: The Netherlands, Province of Fryslân: Hoornsterzwaag, Miedweg, "aan slootje" [along small ditch]; coordinates: Dutch atlas block 11.46; 8 June 1963; leg. J.F. Neve (Holotype: L [L.3130035]; see also Fig. 1).

Plant monoecious, yellowish–green, glabrous, caespitose. Leaves yellowish–green; stem leaves up to 12 cm × 2–3 mm, mostly shorter than the flowering stems, with a 5–30 mm long sheath, basal leaves up to 20 cm × 2–3 mm, shorter than or equalling the flowering stems in length; stomata on the back side; ligule rounded, with lighter free border. Flowering stems 5–20 cm long, prostrate to ascending obliquely, smooth. Inflorescence up to 12 cm long, mostly much shorter, straw-coloured; 1 male spike at the top, ca. 15–25 × 2 mm, with rough peduncle up to 2 cm; male glumes ca. 3.5 × 1.5 mm, brown with a lighter midrib ending before the obtuse, rounded apex; 2–3 female spikes, ca. 10 × 6 mm, short oval, sessile, compact together or somewhat remote, the lowest female spike sometimes much lower; female glumes ca. 2.5 × 1.5 mm, dark brown with lighter midrib, midrib at the top sometimes with some minute bristle hairs, apex rounded or somewhat acute; lowest bract 8–10 cm × 2–3 mm, leaf-like, longer than the inflorescence, with a 5–20 mm long sheath, front side of sheath a bit notched. Utricles 3–4 × ca. 1 mm, yellowish–green, ribbed, gradually tapering into the straight, bifid, 0.9–1.2 mm long beak, at the outside sometimes with a few minute bristle hairs. Nuts not developed, completely sterile; stigmas 3.

Flowering time: June–July.

Habitat — In more or less wet grassland, moisture dune valleys, pioneer vegetation on peaty plots, almost always together with (one or) both parents.

Global distribution — Europe: Estonia, Finland, Germany, Latvia, the Netherlands, Norway, Slovakia, Spain, Sweden, United Kingdom (Koopman 2015).

Distribution in the Netherlands — Kern & Reichgelt (1954) mentioned this hybrid from four sites in the Netherlands: Hoevelaken near Amersfoort (Province of Utrecht), Bennekomse Meent

(Province of Gelderland), in the Roeventer Peel near Weert (Province of Limburg), and in the Kromven near Middelaar (Province of Limburg). The occurrence in the first three locations is supported by herbarium material in L (see Appendix). This hybrid is further known from the four northern provinces: Groningen, Fryslân, Drenthe, and Overijssel. Besides, there are two older records from the West-Veluwe (Province of Gelderland), but these records are not supported by herbarium material in L. The hybrid is currently best known from the Province of Fryslân: Van der Ploeg (1977) mentioned it for the first time for Fryslân from Hoornsterzwaag based on a collection made in 1963 (now designated as the hybrid's holotype); furthermore there is in L a collection from the Boornbergum Krite made by Van der Ploeg in 1985. Koopman et al. (2019) mentioned three more recent finds in Fryslân.

Where both parents grow together, the hybrid seems to be relatively easily produced. Very probably, *Carex × helenae* is not extremely rare, but because of its similarity with both parental species it might be easily overlooked.

Etymology — The authors honour in the epithet Dr. hab. Helena Więclaw, born 1968, professor of Szczecin University in Stettin, Poland, who has done a lot of research on carices (e.g. Koopman & Więclaw 2019, Więclaw 2014, Więclaw 2018, Więclaw & Koopman 2013, Więclaw & Wilhelm 2014), especially on the extremely difficult section *Ceratocystis*, to which *Carex × helenae* belongs.

FINAL REMARKS

More than a century ago it was good practice in botany to distinguish two forms of a *Carex* hybrid, i.e. one form with the one species as the mother parent, the other form with the second species as the mother parent (e.g. Kükenthal 1909). Nowadays, no taxonomic value is attached to these differences in parent-hood. However, concerning *C. × helenae*, we can see on the one hand very small plants, with the size of *C. oederi* (presumably the mother plant), and on the other hand plants which are obviously taller, with the size of, presumably, the mother plant *C. demissa*. However, with regard to the other features of the hybrid this size difference is of little to no taxonomic importance.

Where both parental species co-occur, a search for the hybrid is often successful. In its features, except size, it is intermediate to the parents. The most important diagnostic character is the ripe utricle. Ripe utricles are empty, making the female spikes easy to compress between thumb and forefinger: one does not feel hard nuts in the utricles like in the parental species. The empty female spikes of *C. × helenae* have a paler colour than the female spikes of the parents, straw-yellow–green, like in many other *Ceratocystis*-hybrids.

Hybrids are always better to recognise in the field, when fresh, than when dried as herbarium specimens. If you are in the field at a location where the parent species occur, take the time to pay full attention to 'suspicious' clumps of *Carex demissa* and/or of *C. oederi*, especially when both species grow together. Furthermore, since hybrids seldom-occur as a single plant in a population, look around in the vegetation. A targeted search may result in a much sharper picture of the entire hybrid-population.

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Fig. 1. Holotype of *Carex x helenae* Jac. Koopman, Beusekom & Waltje (L [L.3130035]). Photo: Naturalis Biodiversity Center, Leiden, the Netherlands.

REFERENCES

- Duistermaat H. 2020. Heukels' Flora van Nederland, ed. 24. Noordhoff Uitgevers, Groningen / Utrecht.
- Govaerts R, Jiménez-Mejías P, Koopman J, Simpson D, Goetghebeur P, Wilson K, Egorova T, Bruhl J. Continuously updated. World checklist of Monocotyledons. The Board of Trustees of the Royal Botanic Gardens, Kew. Available at <http://apps.kew.org/wcsp/monocots/>. (Accessed 12 December 2019).
- Hedrén M. 2002. Patterns of allozyme and morphological differentiation in the *Carex flava* complex (Cyperaceae) in Fennoscandia. *Nordic J. Bot.* 22: 257–301. (<https://doi.org/10.1111/j.1756-1051.2002.tb01373.x>).
- Kern JH, Reichelt TJ. 1954. Cyperaceae, *Carex*. In: van Soest JL, Heimans J, van Ooststroom SJ, Flora Neerlandica 1, 3. Koninklijke Nederlandse Botanische Vereniging, Amsterdam.
- Koopman J. 2010. *Carex*-hybriden in Nederland. *Gorteria* 34: 159–169.
- Koopman J. 2015. *Carex Europaea*, volume 1, ed. 2, e-book. Margraf Publishers, Weikersheim.
- Koopman J, Więclaw H. 2016. The section *Ammoglochin* Dum. (*Carex*, Cyperaceae) in the Netherlands. *Gorteria* 38: 43–55.
- Koopman J, Więclaw H. 2017. The section *Phaestoglochin* (*Carex*, Cyperaceae) in the Netherlands. *Gorteria* 39: 79–87.
- Koopman J, Więclaw H. 2019. The section *Ceratocystis* (*Carex*, Cyperaceae) in the Netherlands. *Gorteria* 41: 1–13.
- Koopman J, Więclaw H, Waltje H. 2021. *Carex* × *terschellingensis* hybr. nov. [= *Carex acuta* × *C. trinervis*] and *Carex* × *reichgeltii* hybr. nov. [= *Carex acuta* × *C. aquatilis*], Cyperaceae, found in the Netherlands. *Gorteria* 43: 27–34.
- Koopman J, Timmerman A, Hosper U, Więclaw H. 2019. Distribution, ecology and morphology of three *Ceratocystis* hybrids in the Province of Fryslân, the Netherlands (*Carex*, Cyperaceae). *Gorteria* 41: 14–20.
- Koopman J, van Beusekom CF, Waltje H. *Carex*. In: Nova Flora Neerlandica (in prep.).
- Kükenthal G. 1909. Cyperaceae-Caricoideae. In: Engler HGA (ed.). *Das Pflanzenreich. Regni vegetabilis conspectus*, 4, 20 (Heft 38): 1–824; *Carex*: 67–767. Verlag von Wilhelm Engelmann, Leipzig.
- van der Ploeg DTE. 1977. Atlas fan de floara fan Fryslân. Fryske Akademie, Ljouwert [Leeuwarden].
- Więclaw H. 2014. *Carex flava* agg. (section *Ceratocystis*, Cyperaceae) in Poland: taxonomy, morphological variation, and soil conditions. *Biodivers. Res. Conserv.* 33: 3–88. (<https://doi.org/10.2478/biorc-2014-0001>).
- Więclaw H. 2018. Within-species variation among populations of the *Carex flava* complex as a function of habitat conditions. *Pl. Ecol. & Diversity* 10: 443–451. (<https://doi.org/10.1080/17550874.2018.1440442>).
- Więclaw H. & Koopman J. 2013. Numerical analysis of morphology of natural hybrids between *Carex hostiana* and the members of *Carex flava* agg. (Cyperaceae). *Nordic J. Bot.* 31: 464–472. (<https://doi.org/10.1111/j.1756-1051.2013.00095.x>).
- Więclaw H. & Wilhelm M. 2014. Natural hybridization within the *Carex flava* complex (Cyperaceae) in Poland: morphometric studies. *Ann. Bot. Fenn.* 51: 129–147.

APPENDIX

Studied material of *Carex ×helenae*

The specimens listed here come from the Netherlands and are presented in chronological order. They are preserved either in L or in the first author's private herbarium.

Hoevelaken near Amersfoort (Province of Utrecht); 6 Jun 1917; leg. Jansen et Wachter, v.d. Houten, Sloff: *Carex Oederi* Ehrh.; determ. K. Wiinstedt 1949: Maybe *Carex demissa* × *serotina* (f. *varia*) ([L.3119337](#));
 Roeventer Peel near Weert (Province of Limburg); 20 May 1918; leg. Henrard, Jansen en Kloos: *Carex flava* L. subsp. *C. Oederi* Ehrh. *lepidocarpa*; det. K. Wiinstedt 1943–1949: Maybe *Carex demissa* × *serotina* Mérat (v. *canaliculata* (Callmé))? ([L.3119338](#));
 Bennekomse Meent (Province of Gelderland); 27 Jul 1951; leg. H. Schimmel & Th. Reichgelt: *C. demissa* Horn. × *C. serotina* Mérat ([L.3119336](#));
 Veerslootlanden, Hasselt (Province of Overijssel); 26 Jul 1961; leg. S. Segal ([L.3119335](#));
 Hoorsterzwaag, Miedweg, 11.46 (Province of Fryslân), aan slootje [along small ditch]; 8 Jun 1963; leg. J.F. Neve ([L.3130035](#); **holotype**, Fig. 1);
 Bennekomse Meent (Province of Gelderland); 25 Jul 1973; leg. K. Boeve; det. F. Adema: *Carex demissa* Hornem. × *C. serotina* Mérat ([L.3119334](#));
 Boornbergum Krite, 11.24 (Province of Fryslân), oever van slootje [bank of small ditch], 5 Sep 1985; leg. D.T.E. van der Ploeg ([L.3130029](#));
 Stuttebos, E of Oldeberkoop, 11.56.53 (Province of Fryslân), wet places in Junco-Molinion, where the top soil had been removed; 27 May 2011; leg. H. Waltje & Jac. Koopman (private herbarium Jac. Koopman);
 Bourtange, reserve Het Groninger Landschap (Province of Groningen), along pond, top soil removed, loamy soil; 24 May 2011; leg. Jac. Koopman & T. Dolstra; (private herbarium Jac. Koopman);
 Hurdegaryp, 06.43.53 (Province of Fryslân), path on loamy soil; 1 Jun 2012; leg. H. Waltje; (private herbarium Jac. Koopman).

Additional record of *Carex ×helenae*

Wijnjeterper Skar, N of Wijnjewoude, 11.36.22 (Province of Fryslân); 2017, U.G. Hosper & A. Timmerman (observation!).