IDENTITY AND TYPIFICATION OF *CAREX COGNATA* AND STATUS OF *C. DRAKENSBERGENSIS*

In a useful synopsis of sub-Saharan and Madagascan species of *Carex*, Gehrke (2011: 73) lectotypified the name *Carex cognata* Kunth on 'South Africa, Western Cape Province, Swellendam and George District, *W. Mundt s.n.*' (S) (more correctly it was a neotypification) and since that particular specimen is (in our opinion) part of the same collection cited by Nees (1836) as *C. clavata* Thunb. and currently identified by Gehrke (2011) as such, the action resulted in Gehrke placing *C. cognata* in the synonymy of *C. clavata*. *Carex cognata*, in the sense of recent authors, e.g. Clarke (1898), Kükenthal (1909), Haines & Lye (1983), Gordon-Gray (1995), and Verdcourt (2010) was treated by Gehrke (2011: 75) as *C. congolensis* Turrill, citing several specimens from southern Africa as this species. In the same article, Gehrke (2011: 74) treated the evidently closely related *C. drakensbergensis* C.B.Clarke as a separate species. The aim of this brief note is to discuss and clarify some of the issues of typification and synonymy within this African species complex, mainly with reference to southern Africa.

Carex cognata *Kunth*

Kunth (1837) recognised that the name *Carex retrorsa* Nees (1836) was illegitimate and published *C. cognata* as an avowed substitute. According to Art. 7.3 of the International Code of Botanical Nomenclature (ICBN) (McNeill *et al.* 2006), the replacement name is typified by the older, illegitimate name.

Until now, the identity of *C. cognata* has been in little doubt. *C. retrorsa* Nees (1836: 204) was diagnosed against *C. pseudocyperus* L. by the accompanying phrase 'spiculis masculis geminis, femineis subquaternis approximatis erectis cylindricis subsessilibus, bracteis evaginatis longis, stigmatibus ternis, fructibus ovato-trigonis rostratis bifurcus striatis glabris squamam lanceolatam setaceo-acuminatam serrulato-scabram aequantibus, inferioribus reflexis' [study of a large specimen sample has shown that in fact purely staminate spikes vary between none and two and purely pistillate spikes vary between two and six in number, while the tubular sheathing portion of the lowermost inflorescence bract varies from 0 to 20 mm long (Reid 1991)], and this information was quoted *verbatim* by Kunth (1837) when publishing his new name. Nees (and subsequently Kunth) furthermore highlighted the similarity of his new species to the very distinctive European plant *C. pseudocyperus* L. and Kükenthal (1909) subsequently placed it in the Section *Pseudocypereae* Tuck. It is difficult to imagine that Nees and all reputable Cyperologists since then could have misunderstood the affinities of this plant and also could have confused it with the well-known and (today still) quite common *C. clavata* Thunb., which is described by Nees (1836) in detail in the same article with specimen citations. During the course of her M.Sc. study, Reid (1991) examined several of the collections cited by Nees as *C. clavata* and verified the identifications, bearing in mind that all the original *Carex* material seen by Nees had been lost (see further discussion below). There is no doubt that the holotype of *C. cognata* was still in existence and seen by Kükenthal (1909: 699), who **confirmed its identity** while preparing his monograph of Caricoideae.

Nees (1836: 205) cited the following specimen information under *C. retrorsa*: 'In districtu "Zwellendam et George" legit b. *Mundt*' (see Gunn & Codd (1981) for the correct spelling of this name). **In the same article** Nees cited two additional Mund collections, with the same sparse information, under *C. ecklonii* (p. 203) and *C. clavata* (p. 204) respectively. Our contention is that Gehrke (2011) lectotypified (or more correctly neotypified) the name *C. cognata* on a sheet (acquired by S at a much later date: see discussion below) of the Mund collection that was known to Nees and cited by him as *C. clavata*. Gehrke's (2011) synonymisation of *C. cognata* under *C. clavata* was further motivated by her belief that *C. cognata*, as understood by recent authors e.g. Clarke (1898), Kükenthal (1909), Haines & Lye (1983), Gordon-Gray (1995) and Verdcourt (2010), did not occur in the Western Cape, stating, under *C. congolensis*, that "records from the Western Cape Province in South Africa represent **misapplications** of the name". She apparently saw no coastal southern African records at all, citing (as *C. congolensis*) only one specimen from Lesotho (which Reid determined as depauperate *C. drakensbergensis* C.B.Clarke) and one from Mpumalanga Province, South Africa. We, however, are of the opinion that the species does occur in coastal southern Africa, and cite below the relevant collections seen by Reid (1991) for her M.Sc. study, plus one subsequent record. The Mund locality is very imprecise, and in our opinion it is plausible that Mund encountered this plant somewhere in the ± 200 km between Swellendam and George (probably closer to George: see *Martin 4232* cited below), even though the population may no longer be extant.

Article 9.17 of the International Code of Botanical Nomenclature (ICBN) recommends that an erroneous typification should be corrected once it becomes known. The neotypification by Gehrke (2011) changes the application of the name *C. cognata* and it is therefore relevant to ensure that it is appropriate in accordance with Arts. 9.14 and 9.17 of the ICBN (McNeill *et al.* 2006).

It is firstly necessary to confirm that the Mund specimen on which *C. retrorsa* Nees was based has indeed been lost. Mund's specimens are at B, BR, FI, K, KIEL, MO, and SAM (Gunn & Codd 1981); additionally, upon his death in 1831 Mund's personal herbarium went to C.F. Ecklon (Gunn & Codd 1981) who distributed it on behalf of Mund's estate. Ecklon and Zeyher's collections were widely distributed, and amongst them are included some Mund specimens, usually recognisable from the label bearing some reference to the locality (Swellendam and George District) and/or the collector (usually spelled Mundt). In addition, Kunth's personal herbarium of 70 000 specimens was acquired by B after his death in 1850. More relevantly to this issue, Nees's herbarium of ± 10 000 specimens was acquired by B in 1855 (Hiepko 1987). Prior to this, Nees (1832, 1833, 1836) was evidently studying Ecklon (and Zeyher)'s collections of Cyperaceae and the titles of his publications suggest that the Mund collections that he cited in these publications were included with these specimens. With the exception of types of *Cyperus* L. and *Eleocharis* R.Br. (in part), nearly all Cyperaceae specimens were lost during World War II (Pilger 1953). Ecklon himself died in 1868 and his personal herbarium was in turn acquired by Sonder, whose collections are now partly at S and partly at MEL (Court 1972; Nordenstam 1980). All of the herbaria mentioned above (Thiers, Index Herbariorum online) were checked as far as possible but no material that could conceivably be part of the original material relating to *C. cognata* Kunth was found.

Turning now to the diagnosis of *C. retrorsa*: 'spiculis masculis geminis, femineis subquaternis approximatis erectis cylindricis subsessilibus, bracteis evaginatis longis, stigmatibus ternis, fructibus ovato-trigonis rostratis bifurcus striatis glabris squamam lanceolatam setaceo-acuminatam serrulato-scabram aequantibus, inferioribus reflexis. [Symbol for] Perennial' translates as 'male spikes paired, females 4 or less, close together, erect, cylindrical, sub-sessile, bracts non-sheathing, long, stigmas 3, fruit ovate-trigonous, rostrate, 2-toothed, striate, glabrous, glumes [= spikelet bracts] lanceolate, setaceous-acuminate, serrulate-scabrid, equalling [in length the fruit], lowermost reflexed. Perennial'. The glabrous utricle plus the spikelet bracts [±] equalling the utricle in length, are in our opinion clearly

diagnostic of *C. cognata*, but certainly not of *C. clavata* in which the utricles are hairy, at least on the rostrum margins, and the spikelet bracts are usually much shorter than the utricles.

C. drakensbergensis *C.B.Clarke*

Clarke (1898) distinguished *C. drakensbergensis* with its longer, drooping, distant, pedunculate spikes with dark ferruginous female bracts from *C. cognata* with shorter, erect, clustered, nearly sessile spikes and greenish female bracts. Shortly afterwards Kükenthal (1909) found that the two taxa were not separable at species level and reduced *C. drakensbergensis* to a variety of *C. cognata.*

Intensive herbarium studies of mainly southern African material (Reid 1991) indicated that plants matching *C. drakensbergensis* occurred mainly at high altitude, growing in open sunny habitats, whereas plants matching *C. cognata sensu stricto* occurred near the coast, in the Okavango Swamps of Botswana, and [not reported by Podlech (1967)] at waterholes in the Great Waterberg of Namibia, growing in lightly shaded habitats. In practice, however, it is not possible to divide herbarium specimens into two meaningful taxa since there are always intermediate examples. At Hogsback in Eastern Cape, we observed individuals conforming to the concept of *C. drakensbergensis* growing in open grassland on a stream bank. A very short distance downstream, individuals of what is evidently the same population were lightly shaded by planted *Pinus* species (the sedge population apparently pre-dating the tree plantation) and conformed to the concept of *C. cognata*. We concluded that the differences between these two taxa are entirely habitat-related, and that *C. drakensbergensis* cannot be upheld as a separate taxon, not even as a variety of *C. cognata*, as was done by Kükenthal (1909). Reid (1991, unpublished) therefore regarded *C. drakensbergensis* as conspecific with *C. cognata*, and Gordon-Gray (1995) formally upheld this synonymy.

Gehrke (2011) once again treated *C. drakensbergensis* as a separate species stating "Most South African material so far identified as *C. cognata* can be assigned to var. *drakensbergensis*, which I also regard as a distinct species (34. *C. drakensbergensis*). The remaining material from South Africa and Lesotho usually has partially pendulous spikes, which are less densely clustered than most material from further north, and both forms (i.e. those with clustered spikes and those with more distant ones) might deserve the status of subspecies. *Carex congolensis* differs from 34. *C. drakensbergensis* by spikes all erect or rarely with a pendulous lateral spike, utricles inflated at maturity and a rostrellum with shorter, 1 mm-long, finer teeth (*C. drakensbergensis* has mostly pendulous spikes, utricles not inflated at maturity and a rostrellum with 1 mm long teeth)." However, having studied numerous herbarium collections (Reid 1991), in our opinion fully mature specimens of *C. drakensbergensis* do indeed have inflated utricles, and as stated above, the perceived differences in orientation of spikes and length of teeth on rostrellum (or rostrum) of the utricles are infinitely variable within these taxa and cannot be employed to separate them.

In light of the above arguments, the treatment of this complex in southern Africa must be as follows:

C. cognata *Kunth* in Enumeratio Plantarum 2: 502 (1837), as a nom. nov. for *C. retrorsa* Nees [*non sensu* Gehrke: 73 (2011) = *C. clavata* Thunb.]; Gordon-Gray: 39 (1995) [incl. *C. drakensbergensis*]; Verdcourt: 447 (2010) [as var. *cognata*]. *C. retrorsa* Nees (1836), hom. illegit. non Schweinitz (1824). *C. pseudocyperus* L. var. *cognata* (Kunth) Boott: 141 (1867). Type: [Western Cape] "In districtu 'Zwellendam et George' legit. b. Mundt" (?†B, holo., not found). Neotype, designated here: [Eastern Cape], 'District Kentani, along streams where marshy, 1 200 ft.' [± 365 m], 22 Sept. 1910, *A. Pegler 151* (PRE, neo.!). [The collections *Pegler 151* from same locality, coll. 19 Sept. 1904 (BOL!), 19 Sept. 1907 (BOL!) and Nov. 1907 (GRA!) all represent *Carex clavata* Thunb.].

C. drakensbergensis C.B.Clarke: 309 (1898); Gehrke: 74 (2011). *C. cognata* Kunth var. *drakensbergensis* (C.B.Clarke) Kük.: 699 (1909); Verdcourt: 447 (2010). Type: East Griqualand [Eastern Cape], Kokstad, Vaal Bank Farm, 18 Dec. 1889, *W.J. Haygarth sub J.M. Wood 4201* (K!, lecto., designated by Gehrke: 74 (2011); BOL!, NH!, isolecto.).

C. congolensis Turrill: 240 (1912); Gehrke: 75 (2011) [incl. *C. cognata* Kunth]. *C. cognata* Kunth var. *congolensis* (Turrill) Lye: 244 (1983); Haines & Lye: 384 (1983). Type: Congo [Democratic Republic of Congo], Katanga, Elisabethville [Lubumbashi], 11°37′S, 27°24′E, 1 150 m, 21 Sept. 1911, *Rogers 10082* (K, lecto., designated by Gehrke: 75 (2011); BOL, isolecto.).

Carex cognata (incl. *C. drakensbergensis*) appears to be the only representative of Sect. *Pseudocypereae* Tuck. in southern Africa. In common with most members of the section, the leaves have a distinctive pattern of cross-venation and together with the bright yellowish-green leaf colour the species is quite distinctive and easily recognised where it does occur, even in the vegetative stage. The cross-venation is even more conspicuous in dried material and easily observed with the naked eye. Extensive fieldwork in southern Africa has shown that the plants are rather sporadic in occurrence and never form large populations. We think that the chief means of long-range dispersal of these wetland plants is by migratory aquatic birds bearing the fruit in mud attached to their feet—hence the isolated occurrence in the Waterberg of Namibia. *C. cognata sensu stricto* also occurs in the Okavango Swamps of Botswana and in South Africa in Limpopo, Mpumalanga, and along the coast of KwaZulu-Natal, and Eastern and Western Cape. If *C. congolensis* with its synonyms is included (see Gehrke 2011), the species extends into Tropical Africa as far north as Tanzania. Forms of the species previously treated under the name *C. drakensbergensis* occur in the midlands of the Eastern Cape, KwaZulu-Natal, and up into the Drakensberg highlands from Eastern Cape and Lesotho, extending through Mpumalanga and along the eastern mountain chain onto the Vumba and Chimanimani Mountains of Zimbabwe and further north into East Africa.

Additional specimens (from coastal South Africa)

KWAZULU-NATAL.—**2732** (Ubombo): Ngwavuma District, Kosi System, Sihadla, shade of tall hygrophilous trees on low bank of stream in swamp forest, (–BB), 8 Jan. 1987, *C.J. Ward 10050* (NH, NU, PRE, UDW); Ubombo District, NE St. Lucia system, Pukwini, marginal to swamp forest, (–DC), 9 Nov. 1972, *C.J. Ward 8094* (NU, PRE, UDW). **2832** (Mtubatuba): Hlabisa District, St. Lucia E shores S of Tewate, in small clearing in swamp forest, (–AB), 16 Dec. 1964, *R.H. Taylor 422* (NH); Hlabisa District, Dukuduku East, light shade just within margin of swamp forest, (–AD), 20 Nov. 1964, *C.J. Ward 5080* (NH, NU, PRE, UDW); Lower Umfolozi District, Richards Bay, common in patches in shade, swamp forest, (–CC), 28 Jan. 1949, *C.J. Ward 716* (NU, UDW); Lower Umfolozi District, Richards Bay, Sontwayo Pan, on margin, (–CC), 3 Feb. 1959, *R.D. Guy & C.J. Ward 69* (NU, PRE). **2930** (Pietermaritzburg): Durban District, Isipingo Beach, wet mud in reed swamp, (–DD), 4 Nov. 1950, *C.J. Ward 1221* (NU, UDW).

EASTERN CAPE.—**3129** (Port St. Johns): Port St. Johns, side of ponds, roots in water, (–DA), Jan. 1929, *H.A. Wager s.n. PRE39183* (PRE). **3228** (Butterworth): Transkei, Elliotdale, Cwebe Nature Reserve, riverlet on N bank of Mbanyana River at bridge, (–BB), 22 Dec. 1992, *E. Cloete 2304* (NH).

WESTERN CAPE.—**3418** (Simonstown): Wynberg District, Hout Bay, near harbour, in very wet sand at foot of dripping cliff, (–AB), 2 Jan. 1972, *P.L. Forbes 421* (J); Simonstown District, Cape Peninsula, Lakeside, at edge of the lake, (–AB), 10 Dec. 1939, *M.R. Levyns 7120* (B, BOL). **3422** (Knysna): Knysna District, [probably Groenvlei], (–BB), ± 1960, *A.R.H. Martin 4232* (K).

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