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Cyperus alopecuroides Rottb. (Cyperaceae): typification and first record for Sicily

SALVATORE BRULLO
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ABSTRACT

BRULLO, S. & S. SCIANDRELLO (2006). *Cyperus alopecuroides* Rottb. (Cyperaceae): typification and first record for Sicily. *Candollea* 61: 365-372. In English, English and French abstracts. *Cyperus alopecuroides* Rottb. (Cyperaceae) has a (sub-)tropical origin and is recorded for the first time in Sicily. This helophyte occurs in southern Sicily along the shore of the “Biviere di Gela”, a small lake not far from the sea. Its nomenclature, ecology, geographical distribution and relationship are examined with *Cyperus dives* Delile and *Cyperus imbricatus* Retz. A neotype is designated.

RÉSUMÉ

BRULLO, S. & S. SCIANDRELLO (2006). *Cyperus alopecuroides* Rottb. (Cyperaceae): typification et première occurrence pour la Sicile. *Candollea* 61: 365-372. En anglais, résumés anglais et français.

Cyperus alopecuroides Rottb. (Cyperaceae) a une origine (sub-)tropicale et est signalée pour la première fois en Sicile. Cette hélrophyte se retrouve dans la Sicile méridionale sur les rivages du «Biviere di Gela», un petit lac près de la mer. Ses nomenclature, écologie, distribution géographique et relations taxonomiques sont examinées en liaison avec *Cyperus dives* Delile et *Cyperus imbricatus* Retz. Un néotype est désigné.

KEY-WORDS: CYPERACEAE – *Cyperus* – Sicily – Distribution – Ecology – Neophytes

Introduction

During field investigations on the coastal flora of southern Sicily, a circumscribed population of a unusual *Cyperus* was found along the lakeshore of the “Biviere di Gela”. It is a huge caespitose halophyte up to 150 cm tall, growing on the shallow waters of a wide lake close to the sea. Based on literature data and herbarium investigations, this perennial hygrophyte can be referred to *Cyperus alopecuroides* Rottb., a typical (sub-)tropical element distributed in several countries of the globe. According to BOULOS (2005) and FEINBRUN-DOTHAN (1986), it is hitherto in the Mediterranean area only known from Egypt and Palestine (Fig. 1) where it occurs along river banks, lakes and salt-marshes. Therefore, this species represents a new record for the continental European flora.

Description

Cyperus alopecuroides Rottb., Descr. Pl. Rar.: 20. 1772 (Fig. 2).

≡ *Juncellus alopecuroides* (Rottb.) C. B. Clarke in Hook. f., Fl. Br. Ind. 6: 595. 1893.

Neotypus (here designated): Rottb., Descr. Icon. Rar. Pl.: tab. VIII, fig. 2. 1773 (Fig. 3).

In the protologue, ROTTBOELL (1772) described this species based on material collected by P. Forsskål in Arabia. Recently KUKKONEN (1998) emphasized that the type specimen is not located at C. Therefore, as neotype of this taxon is here proposed: the iconography published by ROTTBOELL (1773).

Perennial, caespitose with a very short thick woody rhizome. Stems erect, solitary, stout, trigonous, 2-5 mm wide, leafy and thickened at base by sheaths and intravaginal shoots. Leaves generally shorter than the stems, papery, with blade 1-12 mm wide, flat, scabrid, the midrib prominent and lateral veins numerous, fine. Bracts 4-7, leaf like, to 70 cm long. Bracteoles shorter than partial umbel. Inflorescence a compound umbel, with primary rays 5-10, unequal, to 15 cm long, subtrigonus, secondary rays absent or short. Spikes 1-8 clustered, cylindrical, 5-10 mm wide and 15-40 mm long. Spikelets very numerous, 4-7 mm long and 1.6-3 mm wide, ovate, lanceolate to oblong-lanceolate, acute, compressed, 10-20 flowered, golden-brown. Rachilla quadrangular not or narrowly winged. Glumes ovate elliptic, densely imbricate, short-mucronate, 1.8-2.5 mm long and 0.7-1.1 mm wide, flat, 3-7-veined. Stamens 2-3, with filament 0.2-0.3 mm long and anther 0.8-1 mm long. Ovary ellipsoid, 0.3-0.5 mm long, style 0.3-0.5 mm long. Stigmas 2-3, 1-1.4 mm long. Nutlet ellipsoid, 0.8-0.9 mm long and 0.5-0.6 mm wide, plano-convex or unequally 3-sided, shortly stipitate, minutely punctulate, golden-brown.

Iconography. – CLARKE (1884: Fig. 12); VALCKENIER SURINGAR (1898: Fig. 21); TÄCKHOLM (1974: Fig. 292); FEINBRUN-DOTHAN (1986: Fig. 466); BOULOS (2005: 116).

Specimens examined. – **SICILY:** Biviere di Gela, 3.XI.2002, *Sciandrello s.n.* (CAT); Biviere di Gela, 27.XII. 2002, *Sciandrello s.n.* (CAT); Biviere di Gela, 26.I.2003, *Brullo, Giusso & Sciandrello s.n.* (CAT); Biviere di Gela, 4.VIII.2003, *Sciandrello s.n.* (CAT). **EGYPT:** Zarit Naim, 15.X.1858, *Samaritani s.n.* (FI); In paludosis ad Bayueret-en-Mixovatiè prope Alexandriam et ad ripas lacus Mareotis Aeg. inf., 3.V.1877, *Letourneux 147* (FI); Gabbari, VII.1878, *Letourneux s.n.* (FI); Egitto, 1888, *Robecchi & Brichetti s.n.* (RO); Alexandri, 21.III.1892, *Terraciano s.n.* (RO); Suez, 22.XII.1892, *Terraciano s.n.* (RO); Mouzzah, V.1899, *Letourneux s.n.* (FI, RO); Altoura, Shouba, Drain Bank, 9.I.1962, *Sharobim s.n.* (FI); Regione Nilotica Delta nel Papirem, XII-I, *Figari s.n.* (FI); Nelle sabbie alluviali deltoidi nilotiche dell'Alto Egitto, VII-VIII, *Figari s.n.* (FI); In Egypt, VII, *Savi s.n.* (FI). **SUDAN:** Nubia, VIII, *Figari s.n.* (FI). **ERITREA:** Amasen, Pianura di Sabargume, 2.III.1902, *Pappi 100* (FI).

Distribution, ecology and conservation status

According to the literature data (CLARKE, 1884; KÜKENTHAL, 1935-1936; FEINBRUN-DOTHAN, 1986; KUKKONEN, 1998; BOULOS, 2005), *Cyperus alopecuroides* Rottb. is widely distributed in numerous tropical and subtropical territories of central and southern Africa, Madagascar, Comores, Arabia, India, Malaysia, Seychelles, Pakistan, Caucasus, Tropical Australia, Guadeloupe (central America), Macaronesia (Madeira, Canaries, Cape Verde), and the eastern Mediterranean (Egypt, Palestine). In Sicily, this population can probably be considered autochthonous, even if an accidental recent introduction by migrating birds cannot be excluded. In particular, it occurs here in natural places, where it is a member of a well-differentiated hygrophilous plant community with marked thermophilous requirements. These habitats act, as well, as stepping stones for many bird species migrating from Old World tropics to the nesting sites of Europe. *Cyperus alopecuroides* is found along the shore of the "Biviere di Gela" in the tracts with shallow lightly brackish water (Fig. 4).

In this places it is associated with several halophytes typical of these lacustrine habitats, as *Bolboschoenus maritimus* var. *compactus* Hoffm., *Cyperus laevigatus* subsp. *distachyos* (All.) Ball, *Typha angustifolia* L., *Phragmites australis* (Cav.) Steud., *Schoenoplectus tabernaemontani* (C. C. Gmel.) Palla, *Lythrum salicaria* L., *Juncus maritimus* Lam., *Juncus subulatus* Forssk., etc. From a phytosociological point of view, this vegetation can be referred to *Phragmito-Magnocaricetea*, grouping perennial communities of halophytes linked to submerged or periodically flooded soils.

Cyperus alopecuroides is not the only thermophilous element with a southern Mediterranean distribution occurring in Sicily. In fact, many other species with a primarily North-African origin have been found in the southern part of the island, such as *Reaumuria vermiculata* L., *Asphodelus tenuifolius* Cav., *Hormuzakia aggregata* (Lehm.) Guşul., *Lobularia libyca* (Viv.) Meisn., *Silene nicaeensis* var. *perennis* Maire, *Lycium intricatum* Boiss., *Rhus tripartita* (Ucria) Grande, *Nonea vesicaria* (L.) Rchb., etc. Therefore, Southern Sicily can be considered as a refuge territory characterized by ideal ecological conditions and climatological for many thermophilous species.

At present, the Sicilian stand of *C. alopecuroides* is represented by a small population of no more than 30 plants occupying an area of 100 sqm. This species is here represented by huge caespitose plants with abundant fructification, which probably assures the preservation in time of the population. Nevertheless, for its rarity and punctiform distribution this species can be included in the Critically Endangered category of the IUCN, as concerns the European flora (IUCN, 2001).

Taxonomic position and systematic relationship

Cyperus alopecuroides was described by ROTTBOELL (1772) based on specimens collected by Forsskål in Arabia, of which the same author (ROTTBOELL, 1773) one year later published a detailed iconography. This species shows close relationships with, among others, *C. dives* Delile, both share a similar distribution. According to DELILE (1813), FEINBRUN-DOTHAN (1986), KÜKENTHAL (1935-1936), KUKKONEN (1998), both species have the same habit and are only distinguished by some morphological characters of inflorescence and flowers. In particular, *C. alopecuroides* is characterized by: stem 5-7 mm in diameter, inflorescence up to 35 cm long, spikelet 1.6-3 mm wide, rachilla narrowly winged, glumes 1.8-2.5 mm long, not keeled, stamens 2 or 3, stigma 2 or 3, nut plano-convex, while *C. dives* shows stem 2-4 mm in diameter, inflorescence up to 20 cm long, spikelet 1-1.5 mm wide, rachilla not winged, glumes max. 2 mm long, keeled, stamens 3, stigma 3, nut trigonous. Other authors, such as BOULOS (2005), treat *C. dives* as a synonym of *C. alopecuroides*, considering the differences between these two species taxonomically not relevant. Actually, on the basis of the examined herbarium material, the taxa proved to be morphologically well differentiated and, since they often co-occur in the same habitat, they cannot be considered as just a variety of the same species as proposed by BAKER (1884), sub *C. alopecuroides* var. *dives* (Delile) Baker or CLARKE (1886), sub *C. exaltatus* var. *dives* (Delile) Clarke. Therefore, in our opinion they must be treated as distinct species.

Besides, *C. alopecuroides* is quite similar to *C. imbricatus* Retz., another tropical element recently recorded by SOLDANO & SELLA (2000) from northern Italy and by VERLOOVE (2005) from Spain. The diacritic characters of *C. imbricatus* are inflorescence compact, capitate, spikes long cylindrical, 1.5-3.5 cm long with numerous spikelet 3-7 mm long, glumes 1-1.5 mm long with prominent green 3-veined keel and terminal mucro to 0.5 mm long, nutlet 0.6-0.7 x 0.4-0.5 mm, trigonous with acute angles. According to VERLOOVE (2005), the origin of this species in Spain remains uncertain.

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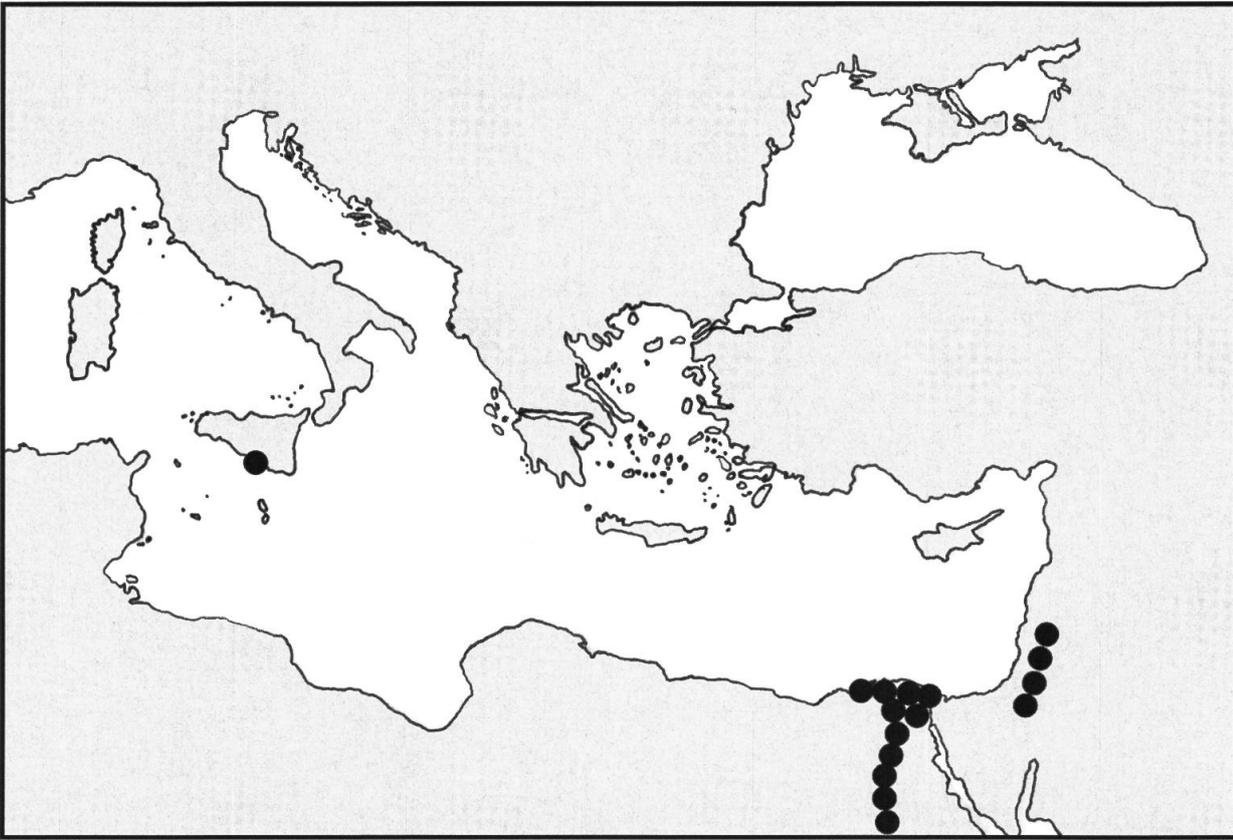


Fig. 1. – Geographical distribution of *Cyperus alopecuroides* Rottb. in the Mediterranean area.

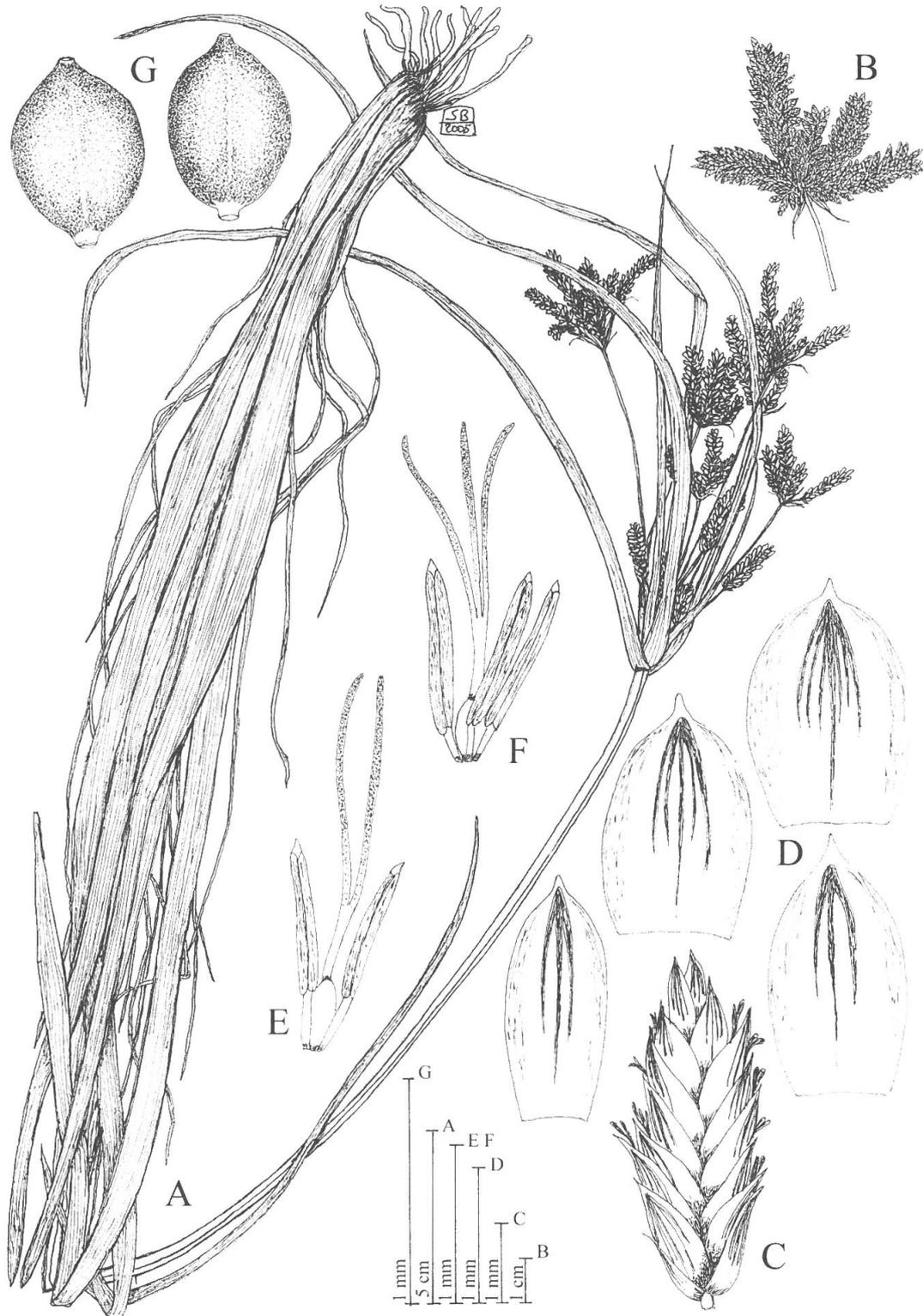


Fig. 2. – *Cyperus alopecuroides* Rottb. (Sicilian specimens). **A:** habit; **B:** detail of inflorescence; **C:** spikelets; **D:** glumes; **E:** dimerous flower; **F:** trimerous flower; **G:** nuts.

(Drawing by S. Brullo).



Fig. 3. – *Cyperus alopecuroides* Rottb. Neotype: C. F. Rottboell, *Descriptionum et iconum variores plantas*: tab. VIII, fig. 2. (Library of the Conservatoire et Jardin botaniques de la Ville de Genève).



Fig. 4. – *Cyperus alopecuroides* Rottb. in the lakeshore of the “Biviere di Gela” (Sicily).