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Cyperus medusaeus (Cyperaceae) redescribed

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Cyperus medusaeus Chiov., an endemic species of coastal Somalia, was described from a sterile specimen. Its identity is confirmed by comparing transverse-sections of leaf-blades of both the type specimen and a recently collected fertile specimen. It is related to *C. jeminicus* Rottb. and *C. celans* Kukkonen, all three species having glabrous roots without rhizosheaths and belonging to the sect. *Arenarii* (Kunth) Jaub. & Spach of *Cyperus*.

Key words: *Cyperus*, *C. medusaeus*, leaf-blade anatomy, Somalia

Chiovenda (1928, 1929) described and illustrated *Cyperus medusaeus* Chiov., despite the fact that the new species was based on a single, sterile specimen. It was thought that the species normally remained sterile. He believed the new species would be recognized well enough through its striking leaf-blades coiled like a serpent (he named it after Medusa, one of the three snake-haired Gorgons in Greek mythology).

More recent collecting in Somalia has shown, however, that spirally coiled leaf-blades are found in several species (Lye 1995). Further, during different developmental stages the coiling of leaf-blades of *Cyperus medusaeus* is possibly dependent on environmental factors. The collection shows two kinds of leaves (Fig. 1), the short coiled leaves below (Fig. 2), and leaves with long blades, eventually longer than their stems developed simultaneously with the elongating stems and inflorescences.

Kükenthal (1936) included the species into sect. *Arenarii* (Kunth) Jaub. & Spach ('sect. *Bobartia* C. B. Clarke'), with a note that the species was not fully understood. In the section he included eight species, with *Cyperus conglomeratus* Rottb. as its central, most polymorphous species. At the same time Rottböll described three other species, presently mostly given varietal rank under *C. conglomeratus* (Kükenthal 1936). However, there are several ecologically significant characters which may be applied for defining taxa in sect. *Arenarii*. *Cyperus conglomeratus* itself has small, unwinged nutlets (Kukkonen 1991). *Cyperus aucheri* Jaub. & Spach, commonly included in *C. conglomeratus*, has large, winged nutlets. *Cyperus jeminicus* Rottb. has gla-

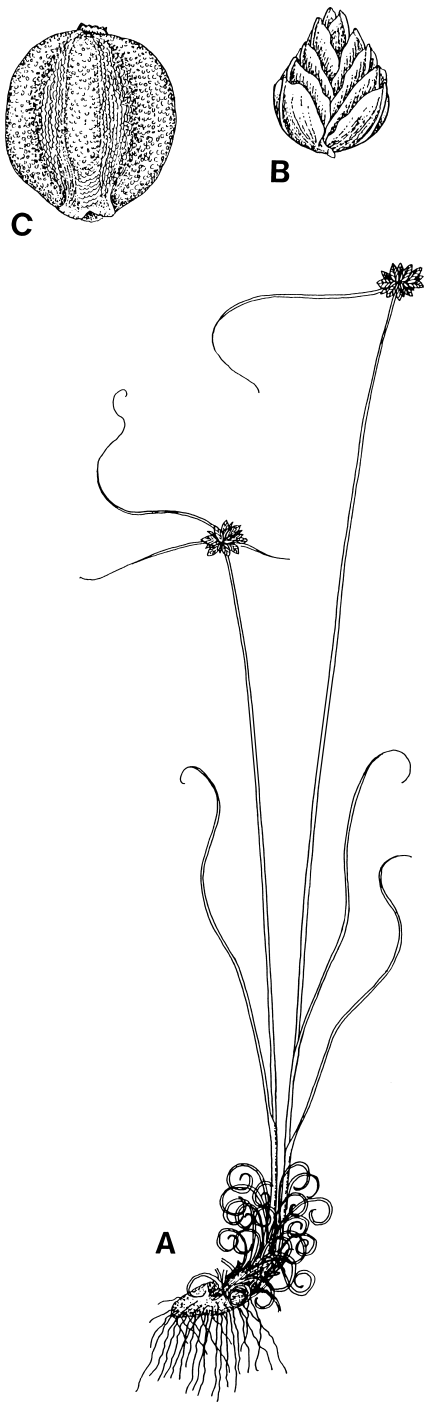

Fig. 1. *Cyperus medusaeus* Chiov. (from *Beckett 380*). — A: Habit, 0.5×. — B: Spikelet, 5×. — C: Achene, 20×. Drawing by Gerd Mari Lye.

brous roots, as also *C. medusaeus*, whereas, e.g., *C. conglomeratus* and *C. aucheri* both have tomentose roots. Although the final, experimental proof in Cyperaceae is missing, it appears that the tomentosity in fact represents a special structure, the rhizosheath, which in the Poaceae is shown to have an ecological, adaptive significance (Danin 1995, in press, Danin & Kukkonen 1995).

When visiting the herbarium in Florence (FT), the author Kukkonen was allowed to remove a couple of small leaf-blades of *Cyperus medusaeus* for comparative anatomical studies within the section *Arenarii* (Kukkonen unpubl.). The cross sections of the leaf blades of *C. medusaeus* (Fig. 3) fit well within the variation range found in the section. However, the combination of characters was thought different enough to warrant specific rank. The cross-section found was compared to those of *C. jeminicus* and *C. celans* Kukkonen (Kukkonen 1995), all three species having glabrous roots without rhizosheaths, and *C. conglomeratus* subsp. *curvulus* (Boeck.) Kukkonen with tomentose roots.

A transverse section of a leaf-blade from the holotype specimen of *Cyperus medusaeus* (Fig. 3, below) shows C_4-anatomy. The outline is thickly crescentiform, with a width of c. 1 mm. There is no abaxial keel. The adaxial side is concave with epidermal cells larger than on the abaxial side. There are no supporting sclerenchyma cells under the adaxial epidermis nor are there marginal sclerenchyma strands. The vascular bundles are surrounded by chlorenchyma lining the abaxial side. The median bundle and the bundles median in each half of the leaf blades are larger than the others. They are also supported by relatively large sclerenchyma girders, although small girders are present in several other bundles as well. The epidermal cells above the girders are silica cells. Stomata are located between the bundles with small air cavities leading to the intercellular spaces within the chlorenchyma. The mesophyll is 5–6 cell layers thick.

In the cross section of the leaf blades of the fertile specimen (*Beckett 380*; Fig. 3) the adaxial epidermal cells are larger than those found in the type specimen of *Cyperus medusaeus*, and the mesophyll layer is slightly thinner. However, the differences found are small and quantitative. It may be concluded that, on the basis of anatomy, *Beckett 380* represents

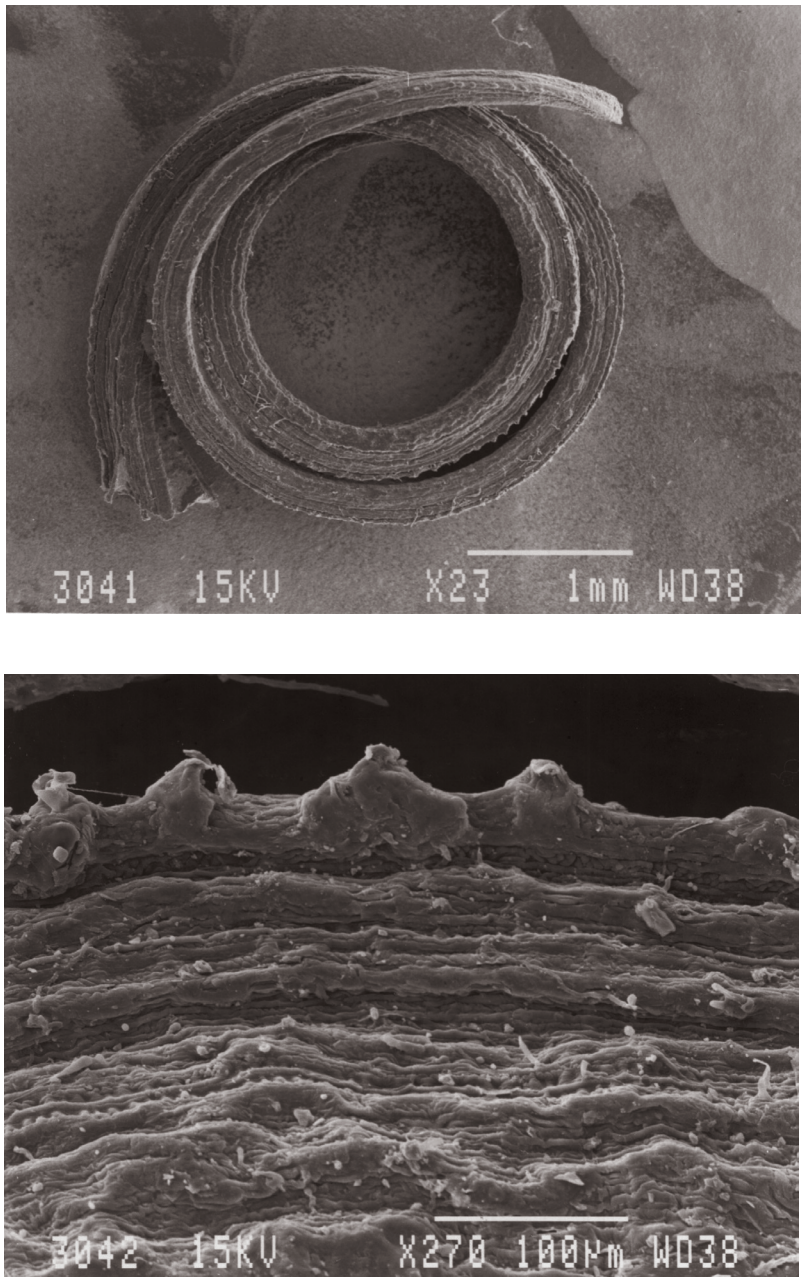

Fig. 2. *Cyperus medusaeus* Chiov. (from *Beckett 380*). — Above: Coiled leaf-blades. — Below: Scabrous margin of a leaf-blade. Photographs by K. A. Lye.

C. medusaeus. The structure found in *Bavazzano 1015* is similar.

Thus the species description of *Cyperus medusaeus* is completed as follows:

Cyperus medusaeus Chiov. (Figs. 1–5)

Lavori R. Istituto Bot. Catania I: 13. 1928. — Holotype: [Somalia, Mudug region,] "Sultanato di Obbia: Steppa fra Obbia e Sissib", 24.IV.1924, *Puccioni & Stefanini 391* (FT!).

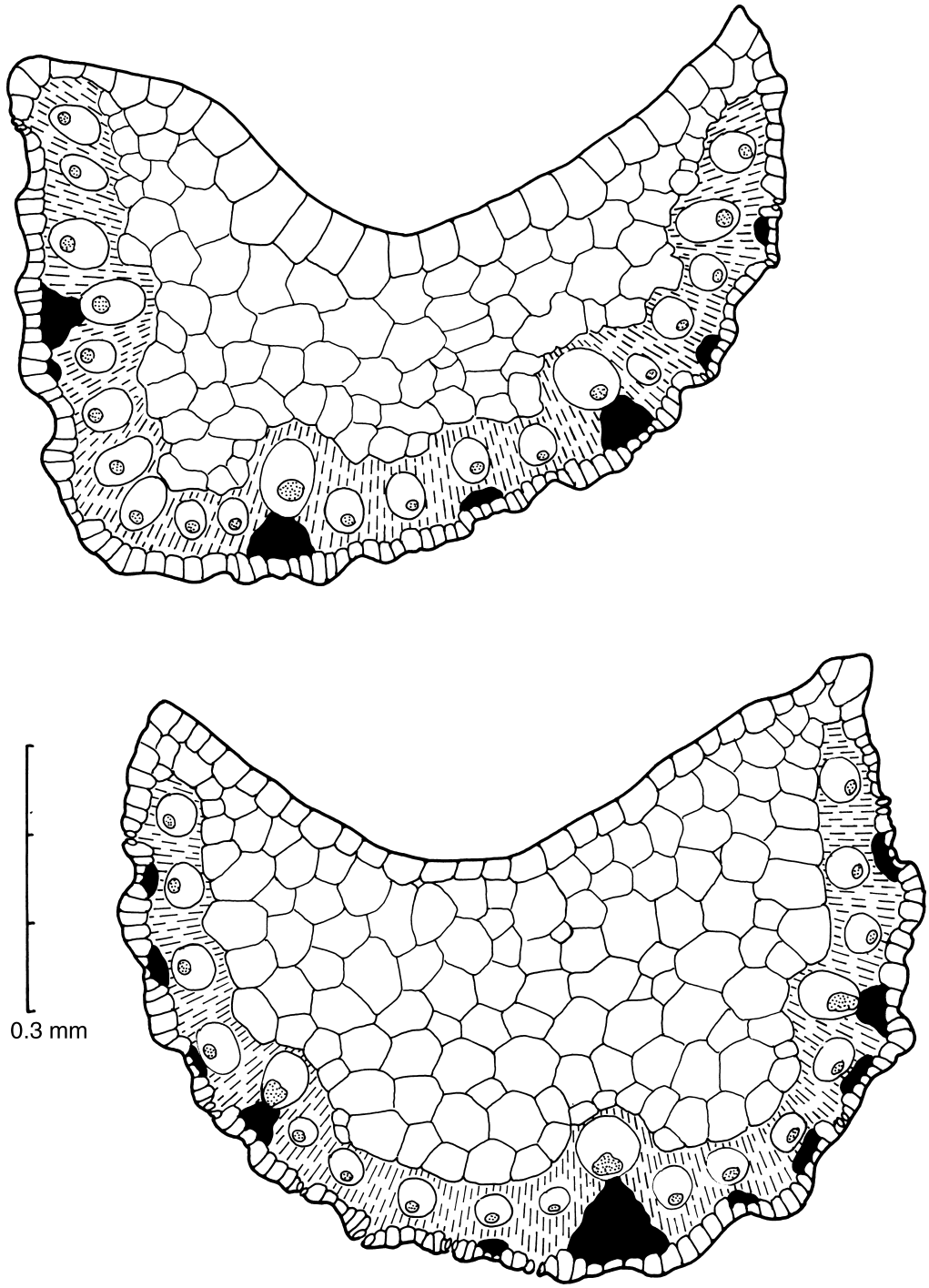

Fig. 3. *Cyperus medusaeus* Chiov. — Transverse sections of a leaf-blades (above from *Beckett 380*, below from the holotype). Drawings by Marja Koistinen.

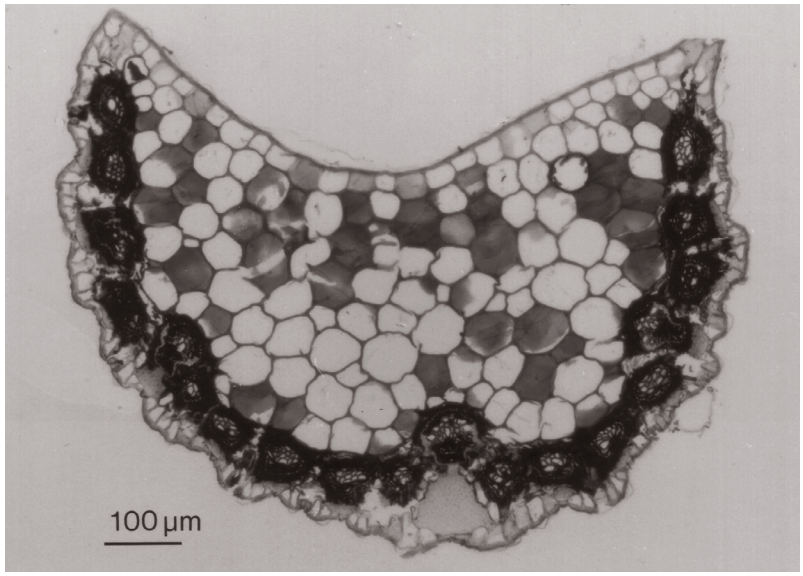

Fig. 4. *Cyperus medusaeus* Chiov. (from the holotype). — Transverse section of leaf-blade. Photograph by Tuuli Timonen.

Caespitose perennial, 5–25 cm tall, forming tight tufts. *Rhizome* to c. 5 mm thick, prominent, woody, with tillers; roots slender, without tomentum. *Stem* 0.7–1.5 mm in diam., solitary or in groups, almost terete, obtusely trigonous or somewhat compressed, glabrous. *Leaves* basal or subbasal, from shorter to longer than stem; sheaths 2–4 cm long, rather soft, glabrous, straw-coloured to reddish-brown, finally disintegrating into fibres, scarious side with prominent almost white, straight mouth margin; ligule 0; blades of two kinds: to 20 cm long, flexuous, or mostly prominently coiled, often less than 3 cm long, 0.5–2 mm wide, thick, crescentiform in transverse section, margins and midrib below prominently but irregularly scabrous with conical barbs, leaf apex long attenuate, acute, scabrous. *Inflorescence* a head, 9–13 mm in diam., formed by a large number of sessile spikes; bracts (1–)2–3, to 9 cm long, spreading, foliose, often not coiled or coiled at apex only. *Spikes* 5–7 × 3–4 mm, ovoid with obtuse or subacute apex, slightly compressed, variegated grey-reddish brown, 10–20 flowered; rachis prominently notched. *Glumes* 2–3 mm long, cymbiform, reddish brown with a pallid margin and 3–4 narrow nerves on each side of the midrib which is green and prominent in upper half of glume; midrib ending in an obtuse apex or excurrent in a short mucro. *Stigmas* 3. *Achene* 0.9–1.0 mm long, outline wide, rounded, triangular in transverse section, all three sides concave, grey and minutely papillose.

Coastal sand dunes and grasslands, evidently restricted at altitudes less than 50 m a.s.l. Endemic to central Somalia.

Cyperus medusaeus is closely related to *C. mogadoxensis* Chiov., but differs in its more coiled leaf-blades, and smaller and less compressed spikelets with smaller glumes and achenes. *Bavazzano 1015* from Uarsiec (SH) is somewhat intermediate with 2.7–3 mm long glumes.

Additional specimens examined. — Somalia. Mudug region: 18 km SW Hobyo (Obbia), 5°17′N, 48°24′E, coastal grassland with *Heteropogon contortus*, *Digitaria*, and *Coelachyrum* spp., 10 m, 7. VI. 1979, *Beckett 380* (FT). Shabeelaha Dhexe region: near Uarsiec, on consolidated dune, 3. IX. 1975, *Bavazzano 1015* (FT).

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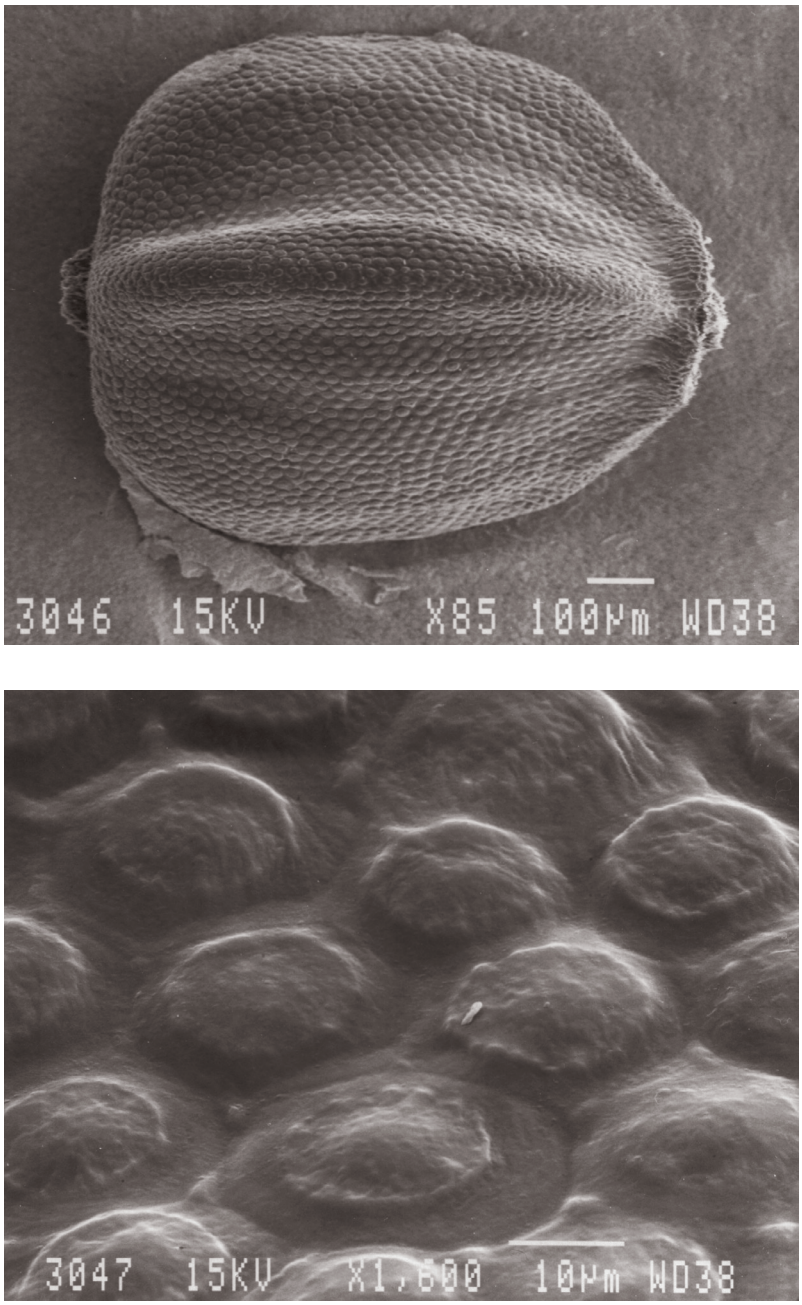

Fig. 5. *Cyperus medusaeus* Chiov. (from *Beckett 380*). — Above: Achene. — Below: Details from epidermal cells of achene. Photographs by K. A. Lye.

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