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# Two New Species of *Cyperus* (Cyperaceae) from the Zambezian Region of Africa

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**ABSTRACT.** *Cyperus abscondit coronatus* Bauters, Reynders & Goetgh. and *C. unispicatus* Bauters, Reynders & Goetgh., two new species of *Cyperus* L. (Cyperaceae) from Angola and Zambia, are recognized. *Cyperus abscondit coronatus* is a tall species (55–100 cm) characterized by a scaled rhizome, a single terminal capitulum, a ciliated spikelet bract, and deciduous spikelets. *Cyperus unispicatus* can be recognized by a swollen and fibrous stem base growing from slender rhizomes, a single terminal spike, and short involucre bracts. The taxa are described and illustrated, and differences with the closest resembling species are discussed.

**Key words:** Africa, Angola, Cyperaceae, *Cyperus*, IUCN Red List, Zambia.

The genus *Cyperus* L. s. str. (Cyperaceae) includes 696 accepted species worldwide (Govaerts et al., 2008). *Cyperus* can be recognized by a usually anthelate inflorescence often with conspicuous involucre bracts, spikelets with several to many fertile and usually distichous glumes, the rachilla of the spikelet either persistent or not, the flowers without a perianth, and a trifid, less often bifid, or rarely nondivided style.

During the examination of some specimens of *Cyperus* in the Ghent University Herbarium (GENT) as part of ongoing research on the genus by the authors, several specimens were encountered that could not be assigned to any known species in the genus (after identification with Kükenthal, 1935–1936; Chermeson, 1937; Hooper & Napper, 1972; Haines & Lye, 1983). One of the specimens (*H. & E. Hess* 52/545) was incorrectly identified by Mincier (1984) as *Mariscus albopilosus* C. B. Clarke (accepted name = *Cyperus albopilosus* (C. B. Clarke) Kük.). In his master's thesis on the Cyperaceae from Angola, he mentioned another specimen (*H. & E. Hess* 52/262) as "*Mariscus* sp. nov." (Mincier, 1984: 180). Both specimens clearly belong to the same new species. In the herbarium of the National Botanic Garden of Belgium (BR), a third specimen (*M. G. Bingham*

7042/2) of this taxon was found, incorrectly identified as *C. rhynchosporoides* Kük.

Mincier (1984: 182) also mentioned the only known specimen (*H. & E. Hess* 52/34) of the second new species, *Cyperus unispicatus* Bauters, Reynders & Goetgh., as "*Mariscus* sp. nov." He placed this new species in *Cyperus* sect. *Bulbocaulis* (C. B. Clarke) Kük., which is characterized by a swollen stem base.

**1. *Cyperus abscondit coronatus*** Bauters, Reynders & Goetgh., sp. nov. TYPE: Angola. Bié: Falls of Cutato River, S of [Kuvango]–Cuchi Rd., 15 Sep. 1952, *H. & E. Hess* 52/262 (holotype, GENT). Figures 1, 2A, B.

Haec species *Cypero rhynchosporoidi* Kük. et *C. albopiloso* (C. B. Clarke) Kük. similis, sed a hoc bracteis involucrelibus 3, inflorescentia majore atque nucula oblonga, ab illo habitu robustiore atque culmo ad basim non incrassato distinguitur.

Perennial herb; rhizomes 6–9 mm thick, with conspicuous red-brown scales that split crown-like as the rhizome thickens; culms 55–100 × ca. 0.2 cm, slender, triangular, erect, ciliated with hairs on the ribs, scabrous, stem base not swollen. Leaves 5 to 8, all basal, lowest leaves reduced to their sheath; sheaths to 13 cm, cinnamon colored; highest leaves with blades; blades rough, 35–65 × 0.5–0.7 cm. Inflorescence a single, terminal, spherical head, 1.5–1.6 cm diam.; involucre bracts 3, ciliated on the edges, 2.5–9.5 × 0.3–0.4 cm. Spikelets deciduous, 5–8 × 1–1.2 mm; spikelet bract 2–3 × ca. 1 mm (measured on folded bract), ciliated on the midrib; spikelet prophyll 2–3 × ca. 1 mm (measured on folded prophyll); glumes 2 per spikelet, distichous; first glume completely enveloping nutlet, 5–8 mm long, 12-veined; second glume strongly reduced, 3.5–4 × ca. 0.8 mm, midrib white. Flowers 1 per spikelet, bisexual; stamens 3, anthers ca. 7 mm; style 1–2 mm; stigma branches 3. Nutlet 5–6 × ca. 1 mm, oblong, trigonous, apiculate, black.

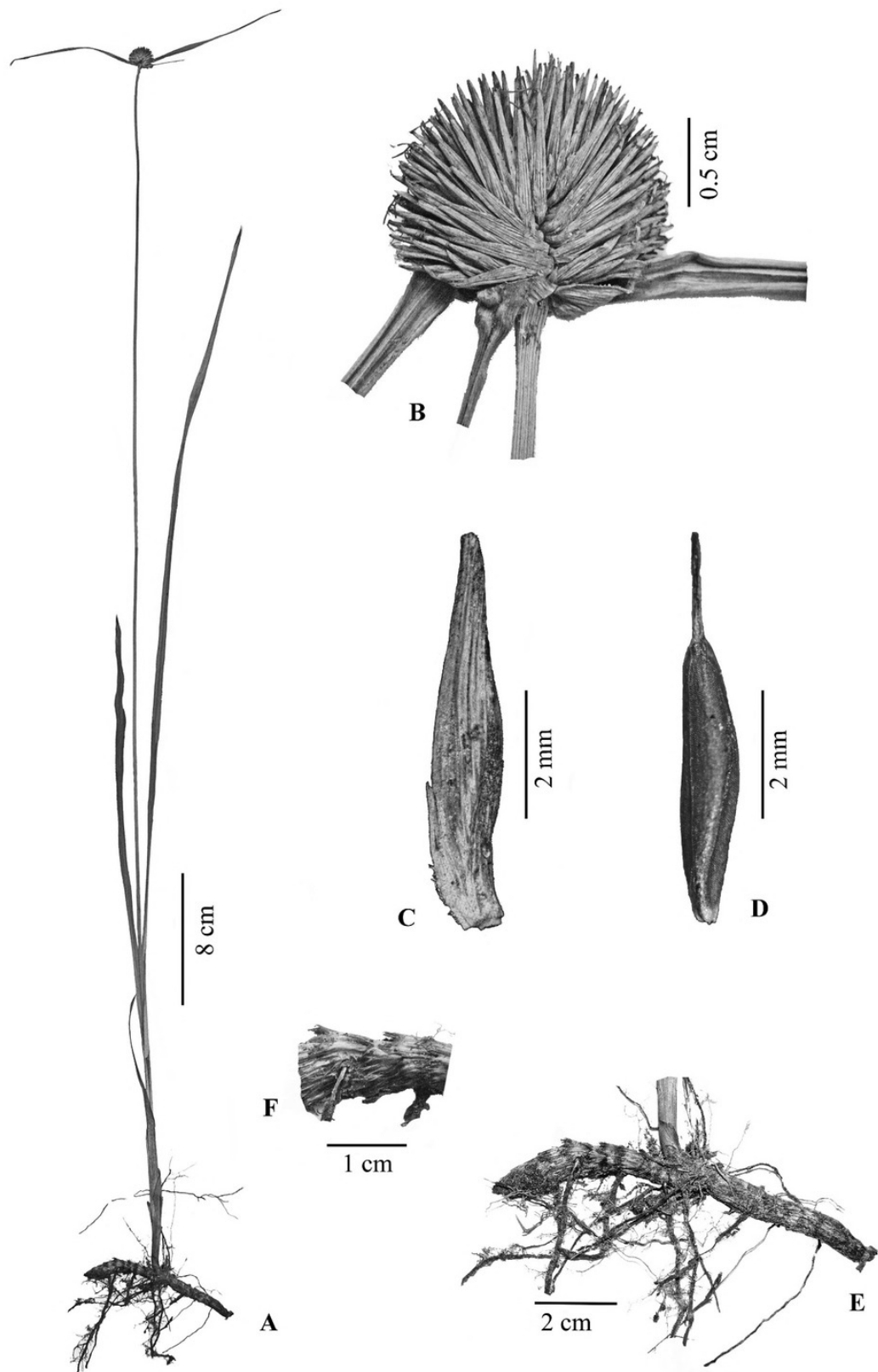


Figure 1. *Cyperus absconditicoronatus* Bauters, Reynders & Goetgh. —A. Habit. —B. Inflorescence. —C. Spikelet. —D. Nutlet. —E. Rhizome. —F. Detail of rhizome scales. From the holotype *H. & E. Hess 52/262* (GENT).

*IUCN Red List category.* *Cyperus absconditicoronatus* should be classified as Data Deficient (DD) according to IUCN Red List criteria (IUCN, 2001).

*Etymology.* The epithet of *Cyperus absconditicoronatus* means “with hidden crown” and refers to the scales of the rhizome, which split crown-like.



Table 1. Morphological comparison of *Cyperus absconditiconatus*, *C. rhynchosporoides*, *C. unispicatus*, and *C. stramineoferrugineus*.

	<i>C. absconditiconatus</i>	<i>C. rhynchosporoides</i>	<i>C. unispicatus</i>	<i>C. stramineoferrugineus</i>
Basal parts	rhizomes, 6–9 mm thick	rhizomes, 3 mm thick	slender rhizome	caespitose
Culm base	not swollen	slightly swollen	swollen: 0.5–0.9 cm	swollen: 0.9–1.3 cm
Culms, dimensions (cm)	55–100 × ca. 0.2	10–50 × 0.1–0.2	(9–)20–32 × 0.05–0.1	10–15 × 0.05–0.1
Culms, section	triangular	triangular to rounded	triangular	triangular, slightly compressed
Leaf blade, dimensions (cm)	35–65 × 0.5–0.7	ca. 30 × 0.3–0.5	(2–)5–14 × 0.1–0.2	5–15 × 0.03–0.1
Inflorescence	spherical capitulum	spherical capitulum	ovate capitulum	spherical capitulum
Capitulum, diam. (cm)	1.5–1.6	ca. 1	0.4–0.7	0.6–1
Involucral bracts	3	2 to 4	1 to 2	2 to 3
Involucral bracts, length (cm)	2.5–9.5	3–6	0.7–1.6	3–5
Spikelets	2 glumes, 1 flower	2 glumes, 2 flowers	3 flowers	4 to 5 flowers
Spikelets, dimensions (mm)	5–8 × 1–1.2	5–6 × ca. 1	2–3.6 × ca. 1	3–5 × ca. 2
Glumes, length (mm)	5–8	4.5–5	1.5–2.5	3.5–4
Spikelet bracts	ciliated on midrib	not ciliated on midrib	not ciliated on midrib	NA
Nutlet, dimensions (mm)	5–6 × ca. 1	NA	1.1–1.3 × 0.5–0.8	1.5–1.8 × 1–1.2
Distribution	Angola, Zambia	Angola, Zambia, Congo	Angola	Tanzania

NA, data not available.

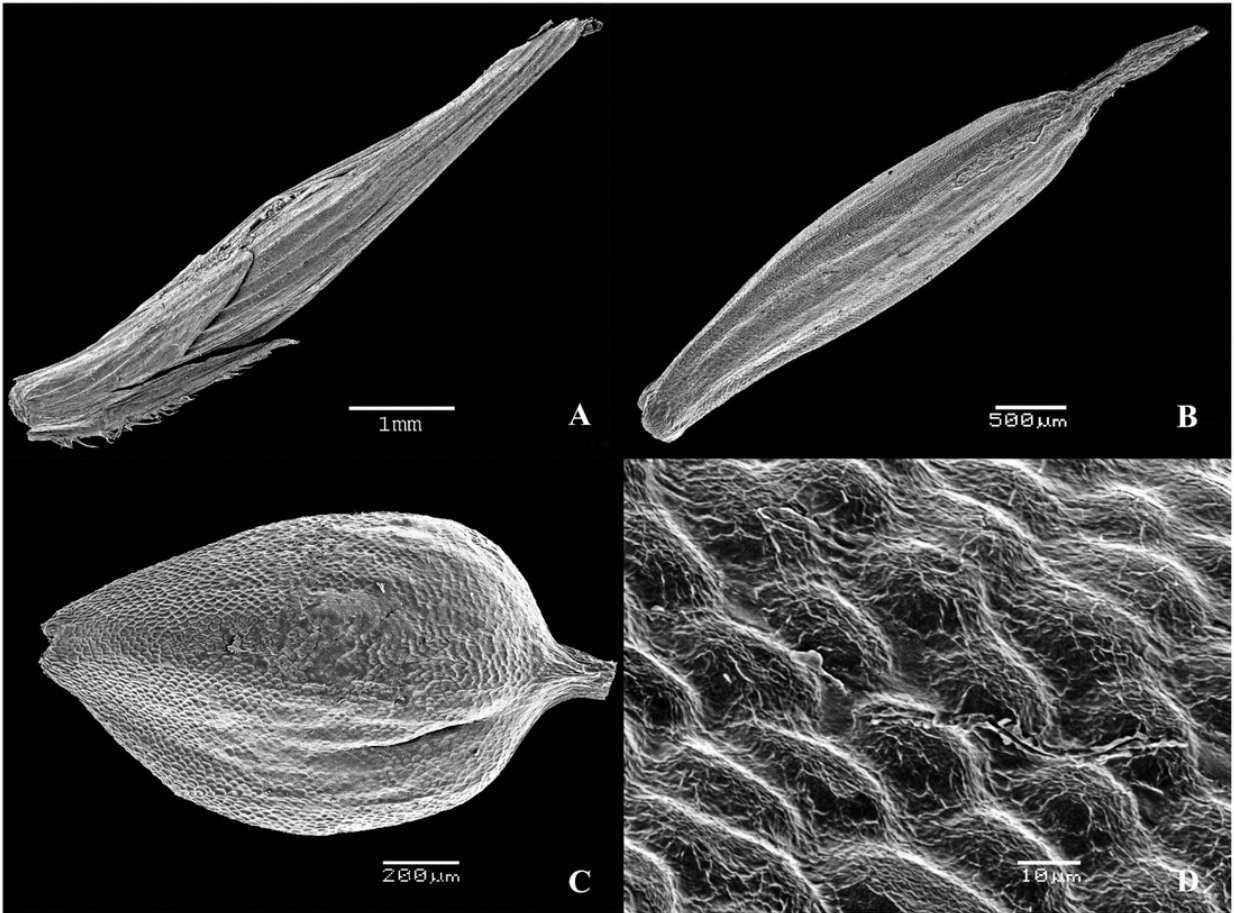


Figure 2. A, B. SEM micrographs of *Cyperus absconditiconatus* Bauters, Reynders & Goetgh. —A. Spikelet. —B. Nutlet. C, D. SEM micrographs of *C. unispicatus* Bauters, Reynders & Goetgh. —C. Nutlet. —D. Nutlet epidermal cells.

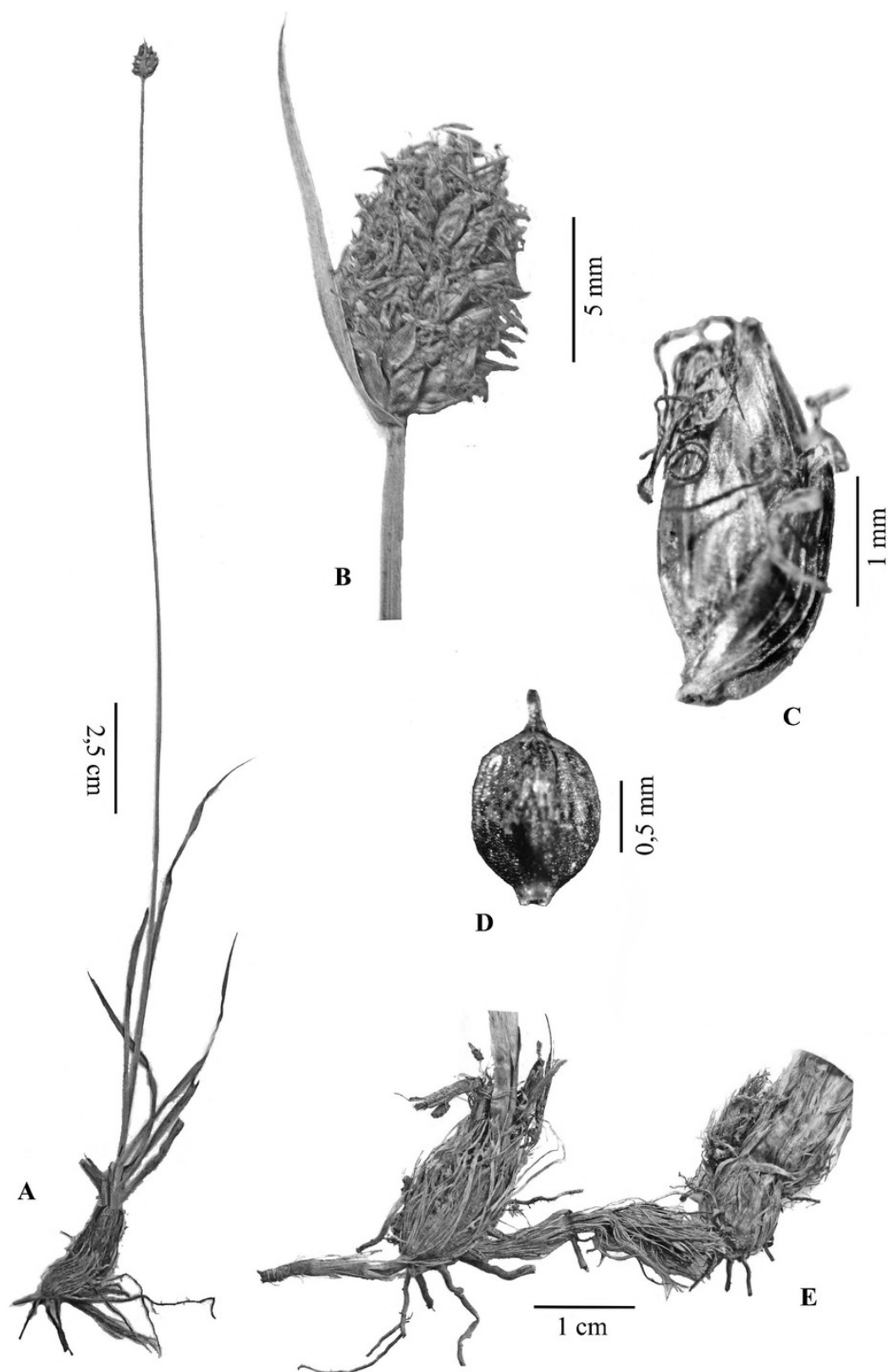


Figure 3. *Cyperus unispicatus* Bauters, Reynders & Goetgh. —A. Habit. —B. Inflorescence. —C. Spikelet. —D. Nutlet. —E. Plant bases. From the holotype *H. & E. Hess* 52/34 (GENT).

*Relationships.* *Cyperus abscondit coronatus* is a tall species characterized by a distinctly scaled rhizome, deciduous spikelets, and a ciliated spikelet bract. The closest resemblance was found in the

species *C. rhynchosporoides*, the type of *Cyperus* sect. *Ochrocephali* Kük. (Kükenthal, 1935–1936). However, *C. rhynchosporoides* is much smaller in all aspects and has a slightly swollen stem base (Table 1). As



mentioned, Mincier (1984) identified one of the specimens of *C. abscondit coronatus* as *C. albopilosus*. However, *C. albopilosus* has a much smaller capitate inflorescence, an ovate nutlet, and only two involucre bracts.

*Paratypes.* ANGOLA. **Bié:** Baixo [Kuvango], 30 km N of Caiundo, N of Mission Capico, 1200 m, 31 Jan. 1952, *H. & E. Hess* 52/545 (GENT). ZAMBIA. **North-Western Province:** Mwinilunga Distr., Wanyizenzi, 7 Jan. 1991, *M. G. Bingham* 7042/2 (BR).

**2. *Cyperus unispicatus*** Bauters, Reynders & Goetgh., sp. nov. TYPE: Angola. Huíla: near Mupa Catholic Mission in Cuanhama, 228 km S of [Kuvango], 1250 m, 9 Sep. 1952, *H. & E. Hess* 52/34 (holotype, GENT). Figures 2C, D, 3.

Haec species *Cypero stramineoferrugineo* Kük. similis, sed ab eo culmo altiore, inflorescentia densiore atque spiculis 3-floris distinguitur.

Perennial herb, forming slender rhizomes; rhizomes dark brown,  $15\text{--}30 \times 1\text{--}1.5$  mm; stem base swollen, 5–9 mm wide, covered in fibrous remains of old leaf sheaths; culms (9–)20–32  $\times$  0.05–0.1 cm, slender, triangular, glabrous. Leaves 5 to 9, all basal, sheaths up to 4 cm long, blades (2–)5–14  $\times$  0.1–0.2 cm, ciliated on the edges and midrib. Inflorescence a single terminal capitate spike, slightly pseudolateral by its involucre bract; spike ovate,  $4\text{--}7 \times (0.5\text{--})0.9\text{--}1$  mm; involucre bracts 1 or 2, largest  $0.7\text{--}1.6 \times 0.07\text{--}0.1$  cm, second involucre bract strongly reduced. Spikelets deciduous but bract and prophyll persistent,  $2\text{--}3.6 \times$  ca. 1 mm; glumes  $1.5\text{--}2.5 \times$  ca. 1 mm, distichous. Flowers 3 per spikelet; stamens 3; style branches 3. Nutlet obovate,  $1.1\text{--}1.3 \times 0.5\text{--}0.8$  mm, triangular, apiculate.

*IUCN Red List category.* *Cyperus unispicatus* should be classified as Data Deficient (DD) according to IUCN Red List criteria (IUCN, 2001).

*Etymology.* The epithet of *Cyperus unispicatus* means “with one spike” and refers to the single terminal spike.

*Relationships.* *Cyperus unispicatus* is characterized by a swollen stem base on a slender rhizome and a single terminal spike with short involucre bracts. *Cyperus unispicatus* most closely resembles *C. stramineoferrugineus* Kük. (Kükenthal, 1935–1936; Haines & Lye, 1983). However, the latter species has a less dense, capitate inflorescence, a shorter culm, and spikelets with four to five flowers (Table 1).

Based on its morphology, *C. unispicatus* could be classified in *Cyperus* sect. *Bulbocaulis* subsect. *Kyllingiformes* Kük. This group consists of perennial herbs with triangular, glabrous (seldom hairy) culms. The stem base is swollen and covered with the sometimes fibrous remains of old leaf sheaths. Most species have thick rhizomes, although some have stolons (*C. chevalieri* Kük.). The inflorescence always consists of a dense spherical or irregular capitulum. The deciduous spikelets are elliptical to lanceolate with one to six flowers.

*Discussion.* *Cyperus abscondit coronatus* and *C. unispicatus* are both found in miombo woodlands in the Zambezian region of Africa. Although only known from a few localities, the new species are potentially present throughout this still poorly known ecoregion, which ranges from Angola to the shores of Lake Victoria in Tanzania.

Both species are characterized by deciduous spikelets and a head-like contracted inflorescence. In addition, *Cyperus abscondit coronatus* has spikelets on which only one nutlet matures. This combination of characters can be found in various lineages within *Cyperus* (especially in the chlorocyperoid clade) such as *Cyperus* sect. *Bulbocaulis*, *Cyperus* sect. *Ochrocephali*, *Kyllinga* Rottb., *Lipocarpha* R. Br., and *Ascolepis* Nees ex Steud. Homologies of the inflorescences of these taxa are still unclear due to the unresolved phylogeny of the *Cyperus* clade with chlorocyperoid anatomy to which these species belong. It is thus premature to place the two new species in any of the known subdivisions, and further study with additional molecular markers is needed to reveal the exact position of the new species. Nevertheless, the two new species can be easily distinguished from all other *Cyperus* species based on morphological evidence.

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