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Gordon C. Tucker

Eastern Illinois University, gctucker@eiu.edu

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Two new species of *Cyperus* (Subgenus *Protocyperus*) from Mexico and Central America

Gordon C. Tucker¹

Department of Botany, Duke University, Durham NC 27706

TUCKER, G. C. (Dept. Botany, Duke Univ., Durham, NC 27706). Two new species of *Cyperus* (Subgenus *Protocyperus*) from Mexico and Central America. Bull. Torrey Bot. Club 110: 161-165, 1983.—*Cyperus nayaritensis*, endemic to Nayarit, Mexico, and *C. microbrunneus*, of Guatemala, Honduras and Costa Rica, are described, illustrated and compared to their nearest relatives.

Key words: *Cyperus nayaritensis*; *C. microbrunneus*; Mexico; Central America

In the course of a study of the genus *Cyperus* in Mexico and Central America two new species have been detected recently, which are described in this paper. Both belong to the Subgenus *Protocyperus* Lye, characterized by spikelets in digitate or capitate clusters, rather than in the spikes found in the remainder of the genus (Lye, 1981). The first new species is from western Mexico, the second from Central America.

Cyperus nayaritensis Tucker, sp. nov. (Fig. 1)

Planta perennis, 23-40 cm alta. Culmi caespitosi, triquetri, scabri. Folii 2.5-5 mm lati. Inflorescentia dense capitata, albo vel rufo-brunnea; radii nulli. Bractae 3-4, foliiformes, 2-10 cm longae, 1-2.5 mm latae. Spiculae 25-45, ovatae vel oblongo-ellipticae, compressae, 3-5 mm longae, 1.9-2.4 mm latae; rachilla exalata, viridis. Squamae 8-16, oblongo-lanceolatae, albae vel rufo-brunneae, 7-9 nervosae, rubro-punctatae, 2.1-2.5 mm longae, 0.8-1.2 mm latae. Stamina 2. Achenium oblongo-lineare, concavo-convexum, 1.3-1.6 mm longum, 0.4 mm latum, apiculatum, puncticulatum, atrobrunneum. Affinis *Cypero michoacensi* Clarke et *C. tenerrimo* Presl.

Cespitose perennial, 23-40 cm tall. Roots fibrous, stiff, wiry. Rhizome short, indurate, dark brown. Culms triquetrous, 0.7-1.8 mm thick, the angles densely scabrellate especially above, with crystalline prickles. Leaves 2-4, 5-36 cm long, 2.5-5.5 mm wide, flat, the margins and keel finely scabrous. Inflorescence bracts 3-4, 2-10 cm long, 1-2.5 mm wide, the margins and keel scabrellate, reflexed from 30 to 60°. Rays lacking, the inflorescence dense, hemispherical, 6-13 mm in diameter, dull white to pale reddish-brown. Spikelets 25-45, ovate to oblong-elliptic, 3-5 mm long, 1.9-2.4 mm wide, strongly compressed, dull white to reddish-brown; rachilla green, quadrate, about 0.2 mm wide, about 0.2 mm thick, slightly zigzag, wingless, successive scale scars about 0.4 mm apart on the same side. Scales 8-16, oblong-lanceolate, excurrent, tridentate, 2.1-2.5 mm long, 0.8-1.2 mm wide, laterally 2-3 nerved, white or yellowish white, with numerous tiny reddish spots, thus appearing dull white to reddish-brown; keel white, 3-nerved. Stamens 2; anthers oblong, about 0.4 mm long, the connective not prolonged; filaments 2-2.4 mm long. Styles about 0.4 mm long; stigmatic branches 3, about 0.8 mm long. Achenes trigonous, linear-oblong, 1-1.1 mm long, about 0.4 mm wide, apiculate, base broadly rounded, not stipitate, adaxial face concave, abaxial faces convex, adaxial angles sharp, abaxial angle broadly rounded, surface punctulate, dark brown.

Endemic to western Mexico, where it is now only known from two collections from Volcán Ceboruco, near Ahuacatlán, Nayarit: 13 August 1959, *Feddema* 418

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Fig. 1. *Cyperus nayaritensis* Tucker, sp. nov. A. Habit. B. Culm, showing scabrellate edges. C. Spikelet. D. Scale. E. Achene with persistent stamens. After Feddema 418 (DUKE).

(DUKE, holotype; MICH, isotype); and, 10 August 1970, Norris & Taranto 15222 (MICH). Crevices and soil pockets on boulders shaded by trees, at about 1100 m.

Cyperus nayaritensis belongs to Section

Leucocephali Cherm. The dense whitish rayless inflorescence subtended by 3–4 bracts clearly indicates this relationship. The new species is about equally closely related to two species in this section, *C. tenerrimus* Presl, ranging from Sinaloa, Mexico to Co-

Table 1. Comparison of *Cyperus nayaritensis* with related species.

	<i>C. tenerrimus</i>	<i>C. nayaritensis</i>	<i>C. michoacanensis</i>
Culms	trigonus to round smooth	triquetrous angles scabrellate	trigonus smooth
Leaves			
Width (mm)	1-2	3.5-5	1.5-3
Scales			
Color	white	dull white to reddish-brown	white
Nerves	5	7-9	5(-7)
Stamens			
Number	1	2	3
Achenes			
Shape	linear-oblong trigonus	linear-oblong, concavo-convex	ovate, concavo-convex
Length (mm)	1-1.1	1.3-1.6	0.8-1.1
Width (mm)	(0.3) 0.4	0.4	0.6-0.7

lombia, and *C. michoacanensis* Clarke, endemic to Michoacán. The differences between the three species are enumerated in Table 1.

In Ayers' (1946) account of *Cyperus* in Mexico, this new species would key to *C. tenerrimus*, from which it can be readily distinguished by its scabrellate culms, wider leaves, and two stamens per flower, rather than one. In the present study, about 150 collections of *C. tenerrimus* from throughout its range have been examined. All had flowers with a single stamen only. Similarly, ten collections of *C. michoacanensis* were examined; all had three stamens per flower. Thus stamen number appears to be a useful character for delimiting species in this section. Kükenthal (1935-36) recognized five species in this section, all of which had either one or three stamens per flower. Therefore, *C. nayaritensis* is unique in Section *Leucocephali* in having two stamens per flower.

This new species appears to be restricted to the slopes of one mountain, Volcán Ceboruco, in Nayarit. The epithet "*nayaritensis*" refers to the name of the state in which the species occurs.

Cyperus microbrunneus Tucker, sp. nov. (Fig. 2)

Planta perennis parva herbacea; culmi glabri; rhizoma brevis. Inflorescentia dense capitata, radii nulli. Spiculae numerosae, 20-100, oblongo-lanceolatae, compressae; rachilla exalata, atropurpurea, albo-vittata. Squamae

12-26, oblongae, muticae, brunneae, vel rufo-brunneae, trinervosae. Achenium ellipticum, trigonum, 0.6 (0.7) mm longum, 0.3 mm latum, apiculatum, papillatum, brunneum, iridescens. Affine *Cypero arsenei* O'Neill et Benedict.

Small tufted perennial 4-15 (30) cm tall. Rhizome short, 1-2 cm long, knotted. Culms approximate, 1-4, trigonus, smooth, 0.3-0.5 (0.7) mm thick, bulbous thickened and whitish below, the base clothed with fibrous remnants of preceding year's leaf sheaths. Leaves 1-4, 2-10 (16) cm long, 0.4-1.2 mm wide, erect or arctuate, flat to v-shaped, apically triquetrous, the margins and keel distally scabrellate. Inflorescence bracts (2) 3 (4), (0.5) 2-6 (8.5) cm long, 0.5-1.6 mm wide, margins and keel scabrellate, straight or arched upward, borne horizontally to reflexed. Rays lacking, the inflorescence a dense hemispherical head 6-12 mm in diameter. Spikelets 20-70 (100), oblong-lanceolate, 2.5-4.5 mm long, 1-1.25 mm wide, strongly compressed, medium to dark brown; rachilla straight, rectangular, wingless, about 0.2 mm wide, about 0.1 mm thick, deep purplish brown, with a white stripe on the center of each side bearing scales, successive scale scars about 0.4 mm apart on the same side. Scales (10) 14-20 (26), oblong, 0.8-0.9 (1) mm long, 0.6-0.8 (0.9) mm wide, the apex broadly rounded, muticous, laterally reddish-brown to brown, glossy, nerveless; keel 3-nerved, greenish distally, whitish proximally, often red speckled as well.

Fig. 2. *Cyperus microbrunneus* Tucker, sp. nov. A. Habit. B. Spikelet, the lower scales and achenes fallen. C. Scale. D. Achene. After Standley 27233 (GH).

Stamen 1; anther oblong-elliptic, about 0.3 mm long, the connective tip minute, much less than 0.1 mm long; filament flat, brown, 0.6–0.9 mm long. Styles 0.2–0.4 mm long; stigmatic branches 3, (0.3) 0.5–0.6 mm long. Achenes trigonous, ellipsoid, 0.6 (0.7) mm long, 0.3 mm wide, apex subacute, apiculate, base cuneate, substipitate to stipitate, about 0.1 mm long, angles broadly rounded, surface with low rounded papillae, brown, iridescent.

Rocky, brushy and grassy slopes and edges of fields, from near sea level to about 300 m; flowering and fruiting specimens collected in June and October. Southern Guatemala to northwestern Costa Rica near the Pacific Coast. Specimens examined: Guatemala: Dept. Zacapa, *Steyermark* 29038 (mixed with *C. uncinulatus* Nees) and 29095 (F), *Standley* 73893 (F). Honduras: Dept. Choluteca, vicinity of Pespire, *Standley* 27233 (GH, holotype; F, isotype). Costa Rica: Guanacaste, Bagaces, *Ocampo* S. 3207 (CR).

This new species belongs in Section *Dichostylis* (Lestib.) Baillon, as indicated by its small size, narrow leaves, densely capitate, rayless inflorescence, oblong-lanceolate spikelets, one stamen per flower, and small stipitate achenes. Within this section, *C. microbrunneus* is most closely related to *C. arsenei* O'Neill & Benedict, a Mexican species which occurs in Sinaloa, Michoacán and Distrito Federal. This relationship is indicated by the short knotted rhizome, persistent leaf sheaths, muticous scales and iridescent brownish achenes. The habitats of the two species are similar, both growing in dry open situations.

Two other species of this section occur in Central America and Mexico, in similar habitats, but neither is likely to be confused with *C. microbrunneus* or *C. arsenei*: *C. seslerioides* H.B.K. has whitish, ovate-lanceolate scales, while *C. uncinulatus* Nees has light brown aristate scales, with a conspicuous excurved mucro.

In *Standley and Steyermark's* (1958)

Flora of Guatemala, *C. microbrunneus* would key to *C. arsenei*. The two species are distinguished as follows:

Culms scabrellate on the angles above; inflorescence bracts 2; spikelets 2-6 (12), the rachilla stramineous; scales 6-10, ovate, light brown to bronze, 1.2-1.6 mm long, 1-1.2 mm wide; achene 0.8-1 mm long, 0.5-0.6 mm wide, dorsiventrally flattened, the adaxial face wider than the two abaxial faces . . . *C. arsenei*

Culms smooth; inflorescence bracts 2-4; spikelets 20-100, the rachilla purplish, white striped on either side; scales 12-26, oblong, reddish-brown or medium brown, 0.8-0.9 mm long, 0.75-0.9 mm wide; achene

0.6-0.7 mm long, 0.3 mm wide, trigonous, the three faces equal . . . *C. microbrunneus*

The epithet "*microbrunneus*" refers to the small brown scales of the spikelets.

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