

*CYPERUS* (SUBG. *QUEENSLANDIELLA*) *HYALINUS*  
(CYPERACEAE) NEW TO THE UNITED STATES AND THE  
WESTERN HEMISPHERE

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ABSTRACT

*Cyperus hyalinus* Vahl is reported from Dade County, Florida, U.S.A. This paleotropical species has not been previously reported from the Western Hemisphere. Its taxonomy and pest potential are discussed. A dichotomous key to the subgenera of *Cyperus* in the United States, technical description, and photographs are provided, and collection data and voucher specimens are cited.

RESUMEN

Se cita *Cyperus hyalinus* Vahl del condado de Dade, Florida, U.S.A. Esta especie paleotropical no ha sido citada previamente del hemisferio occidental. Se discute su taxonomía y su potencial como mala hierba. Se ofrece una clave dicotómica de los subgéneros de *Cyperus* en los Estados Unidos, descripción técnica, y fotografías, y se citan los datos de la recolección y los pliegos testigo.

INTRODUCTION

In late 1999, the second author discovered a population of an unknown *Cyperus* species in Dade County, Florida. Specimens were sent to the first author for determination and were identified by him as *C. hyalinus* Vahl. *Cyperus hyalinus* has a wide paleotropical distribution, ranging from eastern Africa, Madagascar, Mauritius, India, Sri Lanka, tropical Australia (Queensland), and Malaysia (Kükenthal 1935–1936; Kern 1974; Haines & Lye 1983; Koyama 1985). This remarkable little sedge has not been previously reported from the Western Hemisphere.

The taxonomic relationships of *C. hyalinus* are obscure, and its nomenclature is complex. In addition to *Cyperus*, the species has been treated in the segregate genera *Pycreus*, *Kyllinga*, and *Queenslandiella*. It has also been placed in various subgenera of *Cyperus*, i.e., subg. *Kyllinga* (Kern 1974), subg. *Mariscus* (Kükenthal 1935–1936), subg. *Pycreus* (Clarke 1884), and subg. *Queenslandiella* (Govindarajalu 1975; Haines & Lye 1983). Its lenticular achene, bifid style, compressed spikelets with multiple flowers and fruits, and open anthelate inflorescence suggest a relationship with subgenus *Pycreus*. However, persistent scales and disarticulating spikelets defy placement there and indicate an affinity with *Kyllinga* or *Mariscus*. Because its treatment as a *Pycreus*, *Kyllinga*, or *Mariscus* is prob-

lematical, one could segregate it in the monotypic genus *Queenslandiella*; however, consistency would require the segregation of other genera from *Cyperus*, which would upset current nomenclature. Based upon a study of its anatomy, Govindarajalu (1975) placed *C. hyalinus* in monotypic subg. *Queenslandiella* of *Cyperus*. Until there is unequivocal molecular evidence to the contrary, we think a broadly defined *Cyperus* similar to the concept of Haines and Lye (1983) is of value in conserving current nomenclature. Thus, we treat this species in *Cyperus* subg. *Queenslandiella*.

Our objectives herein are to report *C. hyalinus* new to Florida, U.S.A., and the Western Hemisphere and to provide a dichotomous key, technical description, notes, and photographs to facilitate its identification in the United States.

## TAXONOMY

### KEY TO THE SUBGENERA OF *CYPERUS* IN THE UNITED STATES

1. Spikelet rachilla remaining attached to rachis, not basally articulated; floral scales and achenes disarticulating from base to apex of rachilla.
  2. Style branches 3; achenes trigonous.
    3. Spikelets variously arranged, but not in digitate clusters; plants of various habitats; kranz anatomy present. \_\_\_\_\_ subg. **Cyperus** L.
    3. Spikelets in digitate clusters; plants of hydric to mesic habitats; kranz anatomy absent. \_\_\_\_\_ subg. **Anosporum** C.B. Clarke [=subg. *Pycnostachys* C.B. Clarke]
  2. Style branches 2; achenes lenticular (rarely turgid and subterete).
    4. Spikelets laterally compressed; achene angle adjacent to rachilla. \_\_\_\_\_ subg. **Pycreus** (Beauv.) A. Gray
    4. Spikelets cylindrical; achene face adjacent to rachilla. \_\_\_\_\_ subg. **Juncellus** (Griseb.) C.B. Clarke
1. Spikelet, floral scale, and achene articulation not as above.
  5. Style branches 3; achenes trigonous; spikelet basally articulated and deciduous as a unit with floral scales and achenes still attached or spikelet breaking apart transversely into 1-fruited segments.
    6. Spikelet basally articulated, deciduous as a unit with floral scales and achenes still attached to rachilla. \_\_\_\_\_ subg. **Mariscus** (Vahl) C.B. Clarke
    6. Spikelet breaking apart transversely into 1-fruited segments. \_\_\_\_\_ subg. **Dictidium** (Schrad. ex Nees) C.B. Clarke [=subg. *Torulium* (Desv.) Kük.]
  5. Style branches 2; achenes lenticular to plano-compressed; spikelet basally articulated, deciduous as a unit with floral scales and achenes still attached to rachilla.
    7. Floral scales more than 2 per spikelet; flowers and fruits more than 1 per spikelet; inflorescence an open anthelus of mostly pedunculate spikes; achenes plano-compressed. \_\_\_\_\_ subg. **Queenslandiella** (Domin) Govind.
    7. Floral scales 2 per spikelet; flowers and fruits 1 per spikelet; inflorescence capitate, of 1–several dense sessile spikes; achenes lenticular. \_\_\_\_\_ subg. **Kyllinga** (Rottb.) J.V. Suringar

**Cyperus** subg. **Queenslandiella** (Domin) Govind., Reinwardtia 9:194. 1975.

Inflorescence an open anthelus of mostly pedunculate spikes. Spikelets with 2 or more flowers and achenes, basally articulated, falling intact. Floral scales and achenes persis-

tent. Style bifid. Achene plano-compressed, angle adjacent to rachilla. Kranz (chlorocyperoid) anatomy. Subgenus monotypic.

**Cyperus hyalinus** Vahl, Enum. Pl. 2:329. 1805. TYPE: INDIA (C). *Queenslandiella mira* Domin, Biblioth. Bot. 85:416. 1915. *Mariscopsis suaveolens* Cherm. Bull. Mus. Hist. Nat. (Paris) 25:60. 1919. *Pycneus hyalinus* (Vahl) Domin, Biblioth. Bot. 85:417. 1915. *Mariscopsis hyalinus* (Vahl) F. Ballard, Bull. Misc. Inform. Kew 9:458. 1932. *Queenslandiella hyalina* (Vahl) F. Ballard in Hook. Icon. Pl. 33: t. 3208. 1933. *Kyllinga hyalina* (Vahl) T. Koyama, J. Jap. Bot. 51:313. 1976.

Loosely caespitose aromatic annual herb. Roots fibrous, brown. Stems glabrous, trigonous, 3–14 cm × 1–2 mm. Leaves 3–7, basal; bases sheathing; blades 4–15 cm × 2–5 mm. Primary inflorescence bracts 4–8, mostly exceeding rays, longest to 12 cm long, 2–4 mm wide. Inflorescence anthelate; rays 3–8, longest 2.5–4 cm long; spikes simple (rarely with short basal branch), mostly pedunculate, oblong-ovate, (7–)12–20 mm × 8–15 mm, with (5–)12–17 mostly divaricate spikelets; rachis grooved, winged. Bracteoles narrowly triangular to aristate, 0.4–2.2 mm long, membranous. Spikelet prophylls rounded to acute, 0.7–1.4 mm long, membranous. Spikelets laterally compressed, narrowly ovate to elliptic, 4.1–5.7 × 1.9–2.2 mm, deciduous; rachilla wing ca. 0.5 mm wide, membranous. Floral scales 4–7 [3–4 fertile], imbricate, broadly ovate, 2.1–2.4 mm long, mucronate, membranous; keel green, scabrid; wings yellowish to whitish to pale green; lateral nerves 6–8. Stamens 2; anthers narrowly oblong, 0.4–0.5 mm long. Style bifid, divided ca. 3/4 of its length. Achene brown, broadly oblong to suborbicular, 1.0–1.4 × 1.0–1.1 mm, plano-compressed, 0.3 mm thick, gibbous, truncate-retuse, minutely punctulate. Fig. 1.

*Phenology*.—In the United States, flowering late July through November.

*Distribution*.—In the Old World, ranging from eastern Africa, Madagascar, Mauritius, India, Sri Lanka, tropical Australia (Queensland), and Malaysia (Kükenthal *ibid.*; Kern 1974; Haines & Lye 1983; Koyama 1985). Herein reported new to the Western Hemisphere, where so far it is restricted to southern Florida, U.S.A. Fig. 2.

Voucher specimens. **U.S.A. FLORIDA. Dade Co.**: E side of Miami International Airport, just N of Perimeter Rd, road shoulder, sandy soil, 26 Oct 1999, *Randy Mears s.n.* (EIU, FLAS, MICH, MO, US, USE, VDB, VSC).

#### DISCUSSION

*Cyperus hyalinus* (Fig. 1) is readily distinguished from all other congeners by the following combination of characteristics: broadly oblong, truncate-retuse, plano-compressed achene; bifid style; 3–4-flowered, deciduous, flattened spikelets; membranous, yellowish to pale greenish, 6-nerved, mucronate floral scales with scabrid keel; and open anthelate inflorescence. Moreover, dried specimens exhibit the distinctive odor of fenugreek (*Trigonella foenum-graecum* L.), previously noted by various authors (e.g., Kern 1974; Govindarajalu 1975; Bruhl 1995) and also characteristic of *C. fuscus* L., *C. setigerus* Torr. & Hook, and *C. squarrosus* L. (see McKenzie *et al.* 1998).

Herein, the range of *C. hyalinus* is extended to North America (Fig. 2), where it is the most recent in a series of exotic *Cyperus* spp. reported new to the United States (Carter



FIG. 1. *Cyperus hyalinus* Vahl.—A. Scanned image of pressed and dried specimen (*R. Mears s.n.*, 26 Oct 1999), scale bar=1 cm.—B. Photograph of spikelet, scale bar=1 mm.—C. Photograph of achenes, scale bar=1 mm.



FIG. 2. The worldwide distribution of *Cyperus hyalinus* Vahl based upon specimens cited herein (diamond) and literature citations (Ballard 1932, 1933; Kükenthal 1935–1936; Kern 1974; Haines & Lye 1983; Koyama 1985).

1990; Carter et al. 1996; Carter & Bryson 2000). The broad dispersal of such species is not surprising given their weedy nature, their copious production of small fruits, and the current ease and frequency of rapid, long-distance transportation of humans and cargo. Its rarity and proximity to the Miami International Airport suggest a recent introduction of *C. hyalinus* via shipment of air-freight.

In addition to the original population growing along an open, sandy road shoulder, the second author has discovered another one about one-half mile away along a railroad right-of-way. Plants were observed again at these sites in July 2000 associated with *Bidens alba* (L.) DC., *Cenchrus incertus* M.A. Curtis, *Chamaesyce hirta* (L.) Millsp., *C. hyssopifolia* (L.) Small, *C. maculata* (L.) Small, *Dactyloctenium aegyptium* (L.) Willd. ex Asch. & Schweinf., *Polypremum procumbens* L., *Setaria parviflora* (Poir.) Kerguelen, *Sida elliotii* Torr. & A. Gray, and *Tridax procumbens* L.

The occurrence of *C. hyalinus* in Australia, Madagascar, Mauritius, and Zanzibar is sporadic (Ballard 1932, 1933), and it does not appear to exhibit aggressive or invasive properties in southern Florida. Thus, currently *C. hyalinus* would not seem to threaten native biota in the United States, and its tropical distribution in the Old World suggests establishment is unlikely in more temperate regions of North America. However, it should be monitored and additional populations sought in southern Florida, especially in light of its description as "a weed of sandy soils, near sea level" in eastern Africa (Haines & Lye 1983).

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