

***Cyperus entrerianus* Boeckeler, A NEW RECORD FROM VIETNAM**

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ABSTRACT

Cyperus entrerianus Boeckeler, an invasive alien plant from South America, is newly recorded from Vietnam. A morphological description, color illustrations, line drawings and distinguishable morphological characters of *C. entrerianus* from *C. surinamensis* and *C. luzulae* were provided, additionally and short notes, and habitat of the species were also given.

Keywords: Cyperaceae, *Cyperus entrerianus*, invasive alien plant, new record, Vietnam.

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INTRODUCTION

Genus *Cyperus* L. comprises approximately 550 species (Goetghebeur, 1998; Govaerts et al., 2015). In Vietnam, 61 (16.9%) (Nguyen Khac Khoi, 2002) or 79 species (21.1%) (Pham Hoang Ho, 1993) of *Cyperus* have been recorded. During our botanical surveys, an interesting *Cyperus* species was encountered at Ho Chi Minh City, Tay Ninh, Lam Dong, Dong Nai, Ba Ria-Vung Tau and Binh Thuan Provinces, Vietnam. The specimens from those areas have common characteristics of perennial, spikes loosely globose-ovoid; 2nd order rays present; glumes pale green, off-white, or light brown, laterally weakly 1-ribbed, medially 2-ribbed, basally 2-keeled; nut broadly rounded, surfaces finely reticulate. After comparing the morphology of these specimens to the *Cyperus* specimens housed in herbaria, we determined it as *C. entrierianus* Boeckeler, an invasive alien plant from South America (Flora of North America Editorial Committee, 2002).

MATERIALS AND METHODS

Studied specimens of *Cyperus entrierianus* were collected in the South of Vietnam and housed in the Herbarium of University of Science-Vietnam National University Ho Chi Minh City (PHH). Morphology of *Cyperus* specimens at the following herbaria was examined: Singapore Botanic Garden (SBG) and Muséum National d'Histoire Naturelle, Paris (P).

RESULTS

Cyperus entrierianus Boeckeler, 1878. Flora oder Bot. Zeitung 61: 139; Carter, R. 1990. *Cyperus entrierianus* (Cyperaceae), an overlooked species in temperate North America. *Sida*, 14 (1): 69–77.

Type Specimens: HT: Lorentz s.n.; Apr 1876; Argentina: Concepción del Uruguay (B).

Herbs, perennial; rhizomes indurate, oblique, 5–12 mm wide, with fibrous brown floral scales. Culms trigonous to roundly trigonous, 40–65 (-95) cm × 2–3 mm. Leaves all basal, 30–45 (-70) cm × 3–7 mm,

V-shaped, sheaths pale green, eligulate. Involucral bracts 6–8 (-10), V-shaped, 3–7 mm wide, the lower ones overtopping inflorescence. Inflorescence terminal, compound, loosely to densely globose-ovoid, 10–20 mm diam.. Primary rays 6–10, 1–10 cm; 2d order rays 1–4, 0.5–1.5 cm. Spike globose-ovoid, 30–50 (-65) spikelets. Spikelets linear to broadly ellipsoid, 4–6.5 × 1.8–3.2 mm, 16–20 (-26) glumes. Glumes distichous, oblong-lanceolate, 1.2–1.6 × 0.7–0.8 mm, apex acute, mucronate; laterally weakly 1-ribbed, medially 2-ribbed, basally 2-keeled; laterally pale green, margins transparent. Flowers bisexual, naked. Stamen 1. Style slender, not ciliate, not articulate with the nut; stigmas 3. Nut brown, ellipsoid, (sub)round in cross-section, broadly rounded or contracted basally, gradually tapered toward apex, 0.9–1 × 0.3–0.5 mm, apex acute, stipe 0.1 mm, surfaces finely reticulate.

Distribution: South Vietnam: Tay Ninh (Lo Go Xa Mat National Park), Ho Chi Minh City (Can Gio Biosphere Reserve), Dong Nai (Tan Phu Forest Enterprise, Dong Nai Culture and Nature Reserve, Cat Tien National Park), Ba Ria-Vung Tau (Loc An), Lam Dong (Bidoup-Nui Ba National Park) and Binh Thuan (Nui Ong Nature Reserve).

Habitat: various soils, roadside ditches, marshes; 0–2,000 m.

Specimens examined: South Vietnam: Binh Thuan Province, Nui Ong Nature Reserve, PTTN14011 2014 L.N. Anh; Dong Nai Province, Cat Tien National Park, PTTN15135 20-May-2004 N.T.T.T. Mai; Ba Ria-Vung Tau Province, Loc An, PTTN15133 14-Aug-2015 P.T.T. Nha; Ho Chi Minh City, Can Gio Biosphere Reserve, PTTN151354 25-Apr-2015 P.T.T. Nha.

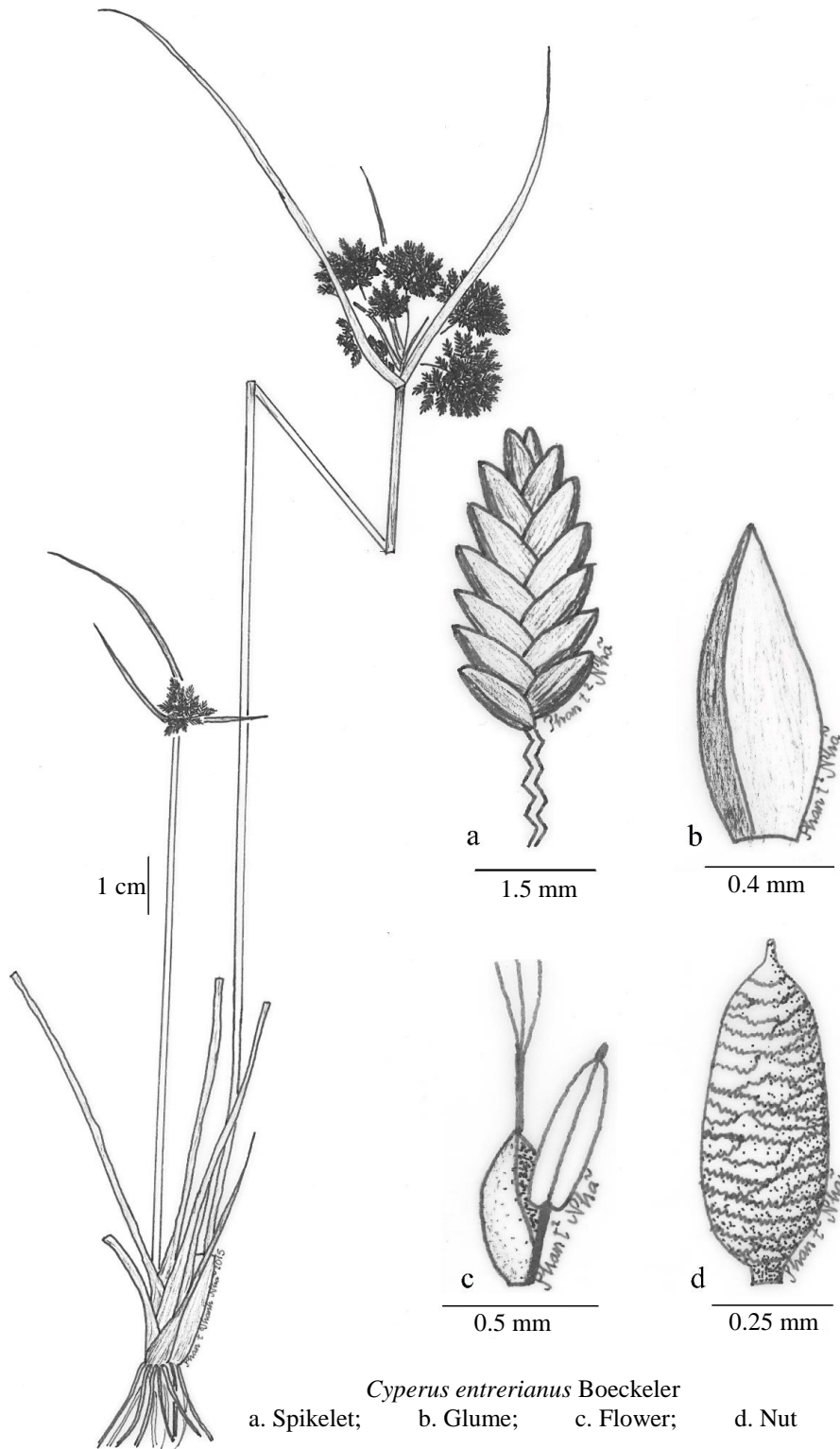
Note: This is a new record of Cyperaceae from Vietnam. As noted in the Flora of North America, this species is very similar to *C. luzulae* and *C. surinamensis*. Morphological characters are following protologue and Flora of North America (Königliche Botanische Gesellschaft, 1878; Linnaeus, 1759; Rottbøll, 1773). Key to distinguish these 3 species:

- 1A. Inflorescence simple; spike densely oblong to pyramidal.....*C. luzulae*
1B. Inflorescence compound; spike loosely globose-ovoid.
2A. Glume pale green, 3 -ribbed; nut (sub)round in cross-section, surfaces finely reticulate;
rhizome present.....*C. entrerianus*
2B. Glume golden yellow to stramineous, 2-ribbed; nut trigonous in cross-section, surfaces
papillate or obscurely reticulate to rugulose; rhizome absent.....*C. surinamensis*



Figure 1. Cyperus entrerianus Boeckeler

a. Growth form, b. Spikelet ($\times 10$), c. Glume ($\times 35$), d. Flower ($\times 40$), and e. Nut ($\times 45$)



Cyperus entrerianus Boeckeler
a. Spikelet; b. Glume; c. Flower; d. Nut

Figure 2. Line-drawing illustration of *C. entrerianus* Boeckeler
(drawn by Phan Thi Thanh Nha)

DISCUSSION

Cyperus entrerianus Boeckeler is a native species in South America (Carter, 1990). In United States, this sedge has dispersed rapidly in agricultural areas and natural plant communities (Carter, 1990; Carter & Bryson, 1996). The richness and aerial cover of native herbaceous species was reduced by the increasing aerial cover of *C. entrerianus* (Rosen et al., 2006).

Cyperus entrerianus is a new record of Cyperaceae from Vietnam. The species was recorded from Binh Thuan Province to the South of Vietnam. While the species was noted as potential invasive sedge in the United States, its effects on agriculture and natural plant communities in Vietnam have not been reported yet in Vietnam.

CONCLUSION

Cyperus entrerianus was newly recorded for the flora of Vietnam. The species was recorded at disturbed zones from Binh Thuan Province to the Southeastern region of Vietnam. There is no any information of the invasive impacts of this sedge on agriculture and natural plant communities in Vietnam so far.

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