



Research note

Rediscovery of *Bouteloua vaneedenii* (Gramineae: Chloridoideae): endemic species from the West Indies

Redescubrimiento de *Bouteloua vaneedenii* (Gramineae: Chloridoideae): especie endémica de las Indias Occidentales

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Abstract. *Bouteloua vaneedenii* is an endemic and extremely rare grass of the West Indies. Very few collections are known, and the most recent collection is from 1922. With the aim of finding the species, a team of Mexican and Cuban agrostologists conducted a field trip and found *B. vaneedenii* in the same locality where it was collected in 1922 on dry limestone rocks. Although it was stated that *B. vaneedenii* probably was extinct from Cuba, vigorous populations remain in at least 2 localities in Pastelillo. Further exploration may lead to the discovery of additional populations and the reevaluation of its current conservation status.

Key words: *Bouteloua vaneedenii*, Chloridoideae, Cuba, Gramineae, endemic, West Indies.

Resumen. *Bouteloua vaneedenii* es un pasto extremadamente raro, nativo de Las Indias Occidentales y del que muy pocas recolectas se conocen hasta ahora, la última se realizó en 1922. Con el objetivo de encontrar la especie, un equipo de agrostólogos mexicanos y cubanos condujeron un viaje de campo en busca de *B. vaneedenii*, la cual fue hallada en la misma localidad donde se recolectó sobre rocas calizas en 1922, a pesar de que se había señalado como probable extinta para Cuba. Se ubicaron 2 poblaciones en buenas condiciones; no obstante, es necesaria una exploración más intensa confirmar su estado actual de conservación.

Palabras clave: *Bouteloua vaneedenii*, Chloridoideae, Cuba, Gramineae, endémica, Antillas Menores.

Pilger described a new species of *Bouteloua* (Chloridoideae), *B. vaneedenii* Pilg. ex Urban, in honor of Beato Van Eeden; its description was published in *Symbolae Antillanae* (Urban, 1909). The species is based on *Boldingh 3512B* (1906 [US holotype fragment]) collected in St. Christopher-Nevis, Anguilla I (Urban, 1909). It is endemic to the West Indies, and very few collections are known: Pastelillo, Cuba (*Ekman 1013* [GH, TAES, HNC]), Leeward Islands, Anguilla (*Boldingh 3512B* [US]), Guadeloupe (*Galla 2542* [NY]), and 2 collections from Venezuela (*H. Pittier 11338* and *Scorza 26197*). Upon revision by the authors, the

Venezuelan specimens turned out to be *B. disticha* (Kunth) Benth. In 1946, León recorded *B. vaneedenii* for Cuba from the *Ekman 15407* and *15546* collections made in October 1922; this represents the most recent vouchered collection of the species. Although the US herbarium voucher of *B. vaneedenii* is commonly cited as *Ekman 1013* (Catasús, 1997; Gould, 1980; Siqueiros-Delgado, 2001), this number is actually the US herbarium accession number. According to the HNC (National Herbarium of Cuba) record, this accession number corresponds to the collection number *Ekman 15546*.

Bouteloua vaneedenii is a member of the *Bouteloua curtispendula* complex, a group of 11 closely related American species (Siqueiros-Delgado, 2001, 2007)

characterized by multiple (12–80) pendulous, unilateral branches, deciduous at maturity, falling intact with the branch rachis, and 1–9 spikelets per branch. *Bouteloua vaneedenii* (Figs. 1a, b) is a perennial herb, caespitose, with conspicuous rhizomes; culms 30–50 cm long and erect; leaves filiform, ashy, and involute, 6–10 cm long and 0.5–1.5 wide; inflorescence composed of unilateral racemes with 15–35 branches, each branch with 2 or 3 spikelets, each with 1 fertile and 1 reduced floret (Fig. 1c); glumes of the fertile floret shorter than the spikelets, purple, 1-veined, keeled; lower glume slightly shorter than the upper; fertile lemma ovate, coriaceous, 3.5–5 mm long, keeled, 3-veined, trifid at the apex, or with 3 short awns; rudimentary floret with lemmas 3-awned, the central one longer than the lateral; anthers orange; Caryopsis with adherent pericarp (Clayton et al., 2002). The diagnostic morphological characters that differentiate *B. vaneedenii* from other species of the complex are the filiform, ashy, and involute leaves, the small ligule 0.5 mm long, and its preference for calcareous soils. There are no chromosome counts for *B. vaneedenii*. Gould and Kapadia (1964) suggested a strong relationship between pollen size and ploidy level in the *Bouteloua curtispindula* complex, and pollen size in *B. vaneedenii* might indicate diploidy. Gould (1980), based on leaf morphology, proposed a close relationship between *B. vaneedenii* and *B. warnockii* Gould et Kapadia, whereas Griffiths (1912) proposed a relationship with *B. uniflora* Vasey. Nevertheless, molecular evidence does not support these hypotheses, suggesting instead a close relationship with *B. curtispindula* (Michx.) Torr. var. *curtispindula* and *B. disticha* (Siqueiros-Delgado, 2001).

The conservation status of *B. vaneedenii* is controversial. Berazaín-Iturralde et al. (2005), based on an extensive field and herbarium work, considered this taxon as near-threatened (“casi amenazado”), as it is restricted to the fast-disappearing coastal xeromorphic habitat. On the other hand, Borhidi and Muñiz (1983) categorized this taxon as “rare” (R), because it is distributed only in the Cuban province of Camagüey. Catasús (1997) surmised that *B. vaneedenii* could even be extinct in Cuba, and the IUCN (2001) listed *B. vaneedenii* as critically endangered (CR 1a), based on its reduced distribution and fragmented habitat. Its current conservation status needs to be re-assessed.

With the aim of finding the most elusive member of the *Bouteloua curtispindula* complex, *Bouteloua vaneedenii*, a team of Mexican and Cuban agrostologists traveled in 2006 to the locality of Pastelillo in the Pastelillo Peninsula, 4.8 km N of Nuevitas in the Bay of Nuevitas, N of Camagüey, and within the Archipelago of the same name in Cuba. We reached Punta Gorda, a small community of scattered houses overlooking Nuevitas Bay and facing the Ballenato Islands. Punta Gorda is traversed by old train tracks running

parallel to the rocky edge of the sea, close to the petroleum terminal of Pastelillo, at 21° 32' 29" N and 77° 13' 15" W (Fig. 2). The old train station was apparently built to facilitate import and export of products such as syrup and petroleum during the 1920s. Large storage tanks serve as a useful geographic reference to locate the area. We walked to a white calcareous slope, facing south along the seashore. With little difficulty, we discovered a healthy, ashy, stiff *Bouteloua* in the piedmont. A vigorous population of *B. vaneedenii* was growing in the same locality where Ekman collected it in 1922, on dry limestone rocks.

We looked for other localities nearby with similar attributes and found additional populations of the species along the road from Varadero to Bahía Honda, ca. 2 km from Pastelillo; *Bouteloua vaneedenii* covered slopes with exactly the same characteristics as in the previous locality at 21° 32' 23" N and 77° 14' 17" W.

In both places, *Bouteloua vaneedenii* grows in open, sunny areas, particularly on inaccessible calcareous rocky slopes, from the piedmont to around 25 m in elevation (Fig. 3). Interestingly, populations of *B. vaneedenii* face south and are exposed to the sea breeze. The surrounding vegetation consists of thorny, coastal xeromorphic shrubs, usually accompanied by deciduous and sclerophyllous shrubs or small trees. Palms, succulents and lianas are common elements in this habitat. Among the representative species of this community are: *Aristida* spp., *Brya ebenus* (L.) DC., *Bourreria cuneifolia* O. E. Schulz, *Bursera inaguensis* Britton, *Caesalpinia vesicaria* L., *Caesalpinia pauciflora* (Griseb.) C. Wright ex Sauvalle, *Chiococca alba* (L.) Hitchc., *Coccothrinax salvatoris* León, *Diospyros crassinervis* (Krug et Urban) Standl., *Encyclia* spp., *Exostema caribaeum* (Jacq.) Roem. et Schult., *Galactia striata* (Jacq.) Urban, *Heliotropium microphyllum* Sw., *Lantana* spp., *Neea shaferi* Standl., *Pilosocereus* aff. *millspaughii* (Britton) Byles et G. D. Rowley, *Plumeria tuberculata* Lodd., *Rondeletia camarioca* C. Wright, *Savia bahamensis* Britton, *Stigmaphyllon diversifolium* (Kunth) A. Juss., *Tillandsia* spp., *Thrinax radiata* Lodd. ex Schult. et Schult. f., *Urechites lutea* (L.) Britton, *Zamia pumila* L., *Ziziphus acutifolia* (Griseb.) M. C. Johnst. This plant community is currently highly fragmented and influenced by secondary and invasive elements such as *Acacia farnesiana* (L.) Willd., *Dichanthium annulatum* (Forssk.) Stapf, *Dichrostachys cinerea* (L.) Wight et Arn., *Leucaena leucocephala* (Lam.) De Wit, *Paspalum millegrana* Schrad., *Sporobolus indicus* (L.) R. Br., and *Waltheria indica* L.

Bouteloua vaneedenii is an extremely rare plant in Cuba and probably throughout the West Indies. We confirm the rediscovery of *B. vaneedenii* in Cuba in the same locality where it was originally collected by Ekman 84 years ago, as well as its presence in nearby areas. Future exploration in



Figure 1. *Bouteloua vaneedenii*. A, plant habit; B, inflorescence; C, inflorescence branch showing 2 spikelets. Vertical bars in A and B= 1 cm, C= 1 mm.



Figure 2. Old train tracks in Punta Gorda, Pastelillo Peninsula, Camagüey, Cuba.



Figure 3. Habitat of *Bouteloua vaneedenii*. Calcareous slopes facing the bay.

the West Indies will give evidence of its current distribution and abundance, and will assist to assess its conservation status. This discovery may allow Cuban environmental authorities to implement control policies to protect and preserve *B. vaneedenii*, given that the West Indies provide a unique natural habitat for this endemic species.

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