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# *Paspalum burmanii* (Poaceae: Paniceae), a New Species from Central Brazil

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**ABSTRACT.** *Paspalum burmanii*, native to central Brazil, is described as a new species in subgenus *Ceresia*. The new species is morphologically related to *P. humboldtianum* Flügge, *P. buchtienii* Hackel, and *P. phyllorachys* Hackel by features of its inflorescences, spikelets, and upper antherium texture and ornamentation. The new species is illustrated and compared with several putatively related taxa. A key to all related species is provided.

**Key words:** Brazil, Paniceae, *Paspalum*, Poaceae.

In the course of our studies on the grasses of South America, a new species of *Paspalum* was discovered growing near the serpentine outcrops of Niquelândia, in the Brazilian state of Goiás, in central Brazil. This is herein described and placed in subgenus *Ceresia* (Persoon) Reichenbach. Subgenus *Ceresia* includes approximately 25 species ranging from Mexico to northern Argentina and Uruguay.

***Paspalum burmanii*** Filgueiras, Morrone & Zuloaga, sp. nov. TYPE: Brazil. Goiás: Mun. Niquelândia, 14°25'S, 48°26'W, planta ereta, margem da estrada entre Niquelândia e Macedo, cerrado, cerrado próximo à mata ciliar, ca. 10 km N Niquelândia, estrada para Macedo, 20 maio 1993, Filgueiras 2471 (holotype, IBGE; isotypes, MO, SI, SP, US). Figure 1.

*Paspalum humboldtianum* Flügge simile sed rhizomatibus robustis, non arcuatis, culmis 1.5–2 m altis, non ramigenis, laminis basalibus secus culmosque, 30–35 cm longis et 1–1.2 cm latis, inflorescentiis 20–25 cm longis, 7–11 racemis praeditis, rachidibus 2.8–3 mm latis, lemmate infero 5-nervio, supra pilosum haud corrugatum et lemmate supero summo glabro recedit.

Robust, rhizomatous, *perennials*, with strong, woody rhizomes, covered with pilose cataphylls; culms 1.5–2 m tall, erect, not branched in the vegetative portions; internodes 7–18 cm long, cylin-

dric, glabrous, lignified, smooth, hollow; nodes compressed, densely pilose, brownish. Blades predominantly basal but also cauline. *Sheaths* 15–22 cm long, longer than the internodes, papillose-pilose, the adaxial surface shining, the margins shortly pilose. *Ligules* 1.8–2.3 mm long, membranous, brownish; pseudoligule absent, collar pilose. *Blades* lanceolate, 30–35 × 1–1.2 cm, reduced toward the apex of the floriferous culm, flat or with involute margins, not pseudopetiolate, the midnerve conspicuous, dense and shortly pilose on both surfaces, the lower portion of the margin with long, tuberculate hairs, otherwise shortly pilose, rounded at the base, the apex acuminate. *Peduncle* subincluded, cylindrical, sparsely pilose. *Inflorescences* terminal, 20–25 × 7–12 cm; main axis 10–18 cm long, flattened, glabrous; racemes 7 to 11, ascendent and divergent from the main axis, alternate, the lower ones 4.5–9 cm long, the upper ones 6–7.5 cm long; pulvini densely pilose, with long and short hairs; rachis of racemes membranaceous, winged, 2.8–3 mm wide, ending in a naked point, glabrous, greenish, the midnerve conspicuous, the veins reticulate, conspicuous, the margins scabrous; pedicels short, scabrous; spikelets paired, densely imbricate, in four series along the rachis. *Spikelets* long-ellipsoid, 3–4 × 1.2–1.5 mm, exclusive of hairs, plano-convex, greenish to purplish. *Lower glume* absent. *Upper glume* as long as the spikelet, 3-nerved, hyaline, densely papillose-pilose toward the margins, with a fringe of whitish hairs, the hairs 1–2 mm long, otherwise sparsely pilose, the margins purplish, thick and corky at maturity, 3-nerved, with one manifest midnerve and two marginal nerves. *Lower antherium* neuter, reduced to a lemma. *Lower lemma* 3.2–3.7 mm long, scabrous, the central portion longitudinally sulcate, 5-nerved, with 3 manifest nerves in the central portion. *Lower palea* absent. *Lower flower* ab-

sent. *Upper anthercium* long-ellipsoid, 2.8–3 × 0.6–0.8 mm, plano-convex, hyaline, gaping at the apex, the apex glabrous, purplish; *upper lemma* 5-nerved, sparsely pilose on the adaxial surface, the margins flat; *upper palea* 2-nerved, keeled, hyaline; *lodicules* 2, ca. 0.2 mm long, conduplicate, hyaline; *stamens* 3, the *anthers* 1.8–2 mm long; *stigma* plumose, emerging at the apex. *Caryopsis* obovoid, 1.3–1.5 × 0.6–0.7 mm, brownish; *hilum* punctiform, basal; *embryo* less than 1/2 the length of the *caryopsis*.

*Paratype.* BRAZIL. **Goiás:** Mun. Niquelândia, 14°25'S, 48°26'W, margem da estrada entre Niquelândia e Macedo, cerrado próximo à mata ciliar, ca. 10 km N Niquelândia, estrada para Macedo, 20 maio 1993, *Filgueiras* 2477 (IBGE, SI).

*Observations.* The winged rachis, and the pilose, hyaline spikelets, with an upper anthercium gaping at the apex are characteristics that clearly place this species within subgenus *Ceresia* (Chase, 1929). Within *Ceresia*, *Paspalum burmanii* is morphologically related to several species, including the following: *P. humboldtianum* Flüggé, which differs by its smaller plants, 30–90 cm tall, with thin, arcuate rhizomes; culms profusely branching; blades 5–21 cm long and 0.5–1.8 cm wide; inflorescences shorter, with 2 to 6 branches, the branch axis (rachis) narrower, 1.2–1.5 mm wide, lower lemma 3-nerved, the adaxial surface corrugated on the lower portion. *Paspalum buchtienii* Hackel, a species closely related to *P. humboldtianum*, differs from *P. burmanii* by (besides the other characters already indicated for *P. humboldtianum*) its drooping racemes and the rachis of the racemes 0.8–1.2 mm wide. *Paspalum humboldtianum* is found along the Andes, from Mexico to Bolivia and Argentina (Tovar, 1993; Renvoize, 1998; Zuloaga et al., 1994; Zuloaga & Morrone, 1999), whereas *P. buchtienii* is restricted to the Andean region in Bolivia (Renvoize, 1998) and southern Peru (Tovar, 1993).

*Paspalum phyllorachis* Hackel, another rare species of subgenus *Ceresia* also found in central Brazil, can be easily separated from *P. burmanii* by the lignified, bambusiform, and leaning culms that reach up to 5 m in height, blades 8–16 cm long, the rachis of the racemes 4–6 mm wide, the glabrous spikelets smaller, 2.1–2.4 mm long, and the upper anthercium 2 mm long.

*Paspalum petrense* A. G. Burman, another related, Brazilian species in subgenus *Ceresia*, originally described from Serra dos Pireneus (Burman, 1980), situated some 200 km from Niquelândia, was recently discovered by the senior author in an area near where *P. burmanii* was collected. *Pas-*

*palum petrense* differs by the fewer number of racemes (3 to 5), a wider inflorescence rachis (7–10 mm wide), spikelets obliquely set on the pedicels, and an upper lemma with a tuft of colorless hairs at the tip.

KEY TO DISTINGUISH *P. BURMANII* FROM RELATED SPECIES OF *PASPALUM* SUBG. *CERESIA*

- 1. Rachis of the racemes (4–)5–10 mm wide; spikelets obliquely placed on the pedicels; margins of the upper glume hyaline . . . . . 2
- 1'. Rachis of the racemes 1–2.5(–3) mm wide; spikelets straight on the pedicels; margins of the upper glume becoming thick and corky at maturity . . . . . 5
- 2(1). Spikelets solitary . . . . . *P. heterotrichon*
- 2'. Spikelets paired . . . . . 3
- 3(2). Spikelets glabrous; plants with lignified, bambusoid culms . . . . . *P. phyllorachis*
- 3'. Spikelets pilose; plants herbaceous, the culms neither lignified nor bambusoid . . . . . 4
- 4(3). Rachis 7–10 mm wide; culms erect . . . . . *P. petrense*
- 4'. Rachis 4–6 mm wide; culms leaning on vegetation . . . . . *P. trachycoleon*
- 5(1). Blades linear to linear-lanceolate, 4–13 cm long, 0.1–0.2(–0.5) cm wide; upper glume with unequal hairs, not radiating as in a corona; lower lemma pilose toward the apex . . . . . *P. polyphyllum*
- 5'. Blades lanceolate, 5–35 cm long, 0.5–1.8 cm wide; upper glume with a fringe of glistening white hairs, the hairs even and radiating as in a corona; lower lemma with glabrous margins . . . . . 6
- 6(5). Inflorescences drooping, lower branches with rachis 0.8–1.2 mm wide; spikelets 0.8–1 mm wide; blades shortly pseudopetiolate, papyraceous . . . . . *P. buchtienii*
- 6'. Inflorescences ascending, lower branches with rachis 1.2–3 mm wide; spikelets 1.2–1.4 mm wide; blades not pseudopetiolate, membranous . . . . . 7
- 7(6). Plants 150–200 cm tall; inflorescences 20–25 cm long, 7–12 cm wide; branches 7 to 11, rachis of the racemes 2.8–3 mm wide; lower lemma 5-nerved, scaberulous, not corrugate . . . . . *P. burmanii*
- 7'. Plants 30–50(–90) cm tall; inflorescences 8–12 cm long, 3–5 cm wide; branches 2 to 6, rachis of the racemes 1.2–1.5 mm wide; lower lemma 3-nerved, scaberulous toward the apex, otherwise glabrous, corrugate . . . . . *P. humboldtianum*

*Distribution and ecology.* The new species was found growing at the edge of a cerrado, i.e., a tall woodland variant type of cerrado (Eiten, 1972) near Macedo, in the municipality of Niquelândia. The plants grew in large clumps and appeared rather robust and healthy, despite the fact that dust from a nearby unpaved road covered most of their leaves.

The site where this colony grew is under intense human activity, since the road nearby was recently expanded at the expense of this population. A single colony was found, but this had more than 100

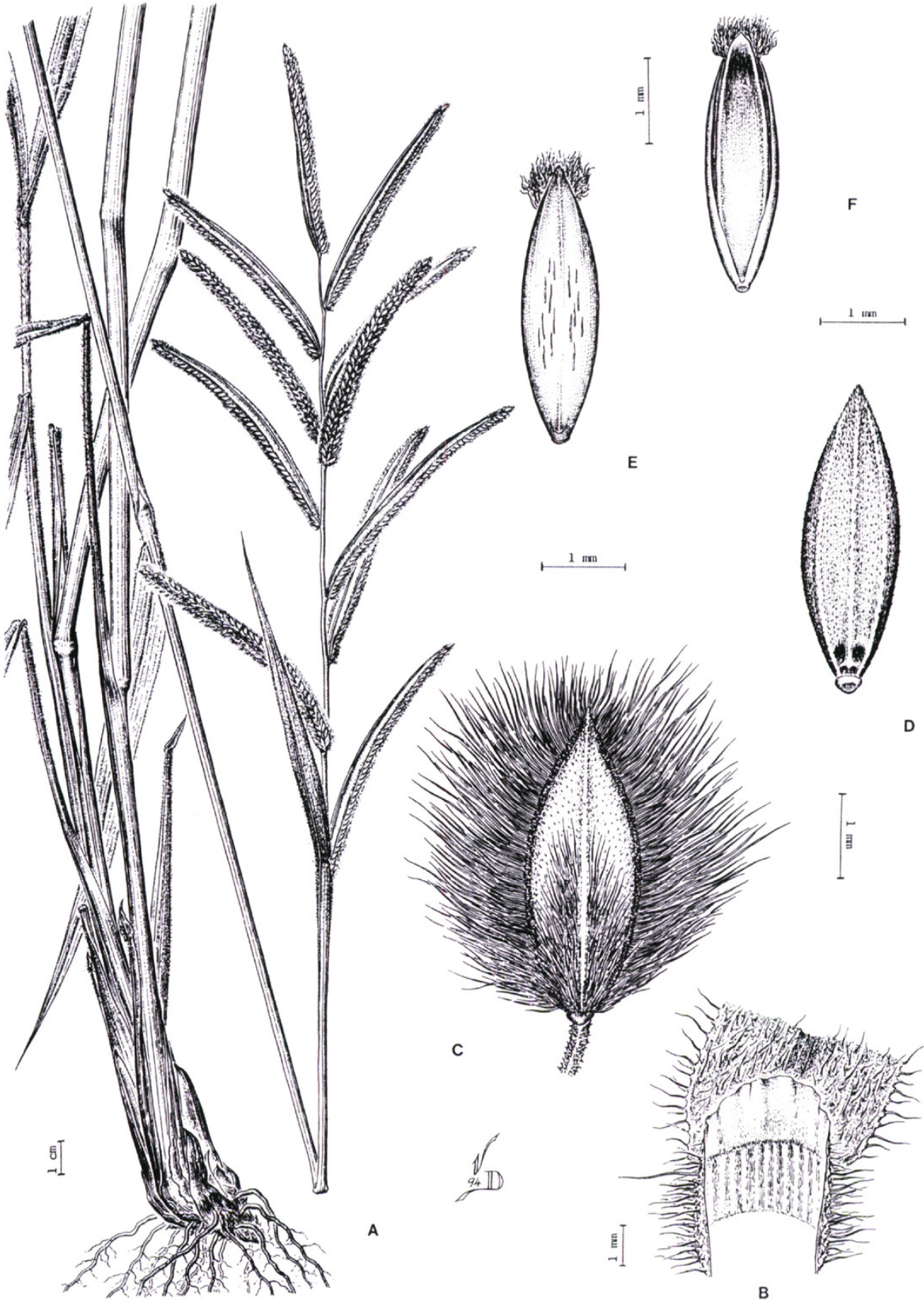


Figure 1. *Paspalum burmanii* Filgueiras, Morrone & Zuloaga. —A. Habit. —B. Detail of ligule. —C. Spikelet, dorsal view showing upper glume. —D. Lower lemma. —E. Upper antheridium, dorsal view. —F. Upper antheridium, ventral view (based on the type, Filgueiras 2471).

clumps. It is noteworthy that around 300–500 m away, there is a serpentine outcrop called “Fonte da Bica,” where the serpentine endemic grass genus and species *Ophiochloa hydrolithica* Filgueiras et al. was collected (Filgueiras et al., 1993). So, although we cannot state that *P. burmanii* grows on serpentine soil, like other species of *Paspalum* recently described from Niquelândia (see Davidse & Filgueiras, 1993; Filgueiras & Davidse, 1994; Filgueiras et al., 1993; Filgueiras, 1995), it certainly grows in an area of serpentine influence.

The serpentine outcrops in the municipality of Niquelândia have yielded a remarkable wealth of new Poaceae, especially in the genus *Paspalum*. The first species described from the area was *P. longiaristatum* Davidse & Filgueiras (Davidse & Filgueiras, 1993), followed by *P. biaristatum* Filgueiras & Davidse (Filgueiras & Davidse, 1994), and *P. niquelandiae* Filgueiras (Filgueiras, 1995).

Taxa in the serpentine outcrops in Niquelândia face a bleak future. As of now no conservation unit of any sort exists in the state of Goiás or anywhere else in Brazil that can offer legal protection to the plant species from these outcrops. The land where all these serpentine and serpentine-related species grow belongs to a private mining company (Companhia de Níquel Tocantins) that maintains an active plant in the area, with three working shifts. If a conservation campaign is not launched soon to convince the land owners to set aside representative samples of the serpentine outcrops as permanent conservation areas, there is little hope for the survival of any of these species.

There is some hope, however. In a recent workshop held in Brasília, the capital of Brazil, under the auspices of the Brazilian Ministry of the Environment, three NGOs (non-governmental organizations), and the University of Brasília addressed conservation issues in the cerrado region. Eighty-seven areas were selected for special conservation efforts. Due to the efforts of a few dedicated botanists present at the workshop, Niquelândia was one of the sites selected for special conservation efforts (BRASIL, 1999).

The specific epithet commemorates our late friend and collaborator Alasdair G. Burman, an expert on Brazilian grasses, especially the genus *Pas-*

*palum*. Before his sudden and premature death in 1992, Alasdair was preparing a revision of subgenus *Ceresia* and had a chance to examine the specimens that were used here to describe *P. burmanii*. It is fitting that we also honor here Alasdair’s widow, Laura Burman, and son, Nickolas Burman.

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