

A New Species of *Homozeugos* (Poaceae) from Angola

Gerald F. Guala

Fairchild Tropical Garden Research Center, 11935 Old Cutler Rd., Coral Gables (Miami), Florida 33165, U.S.A. (address for correspondence), and Department of Biological Sciences, Florida International University, Miami, Florida 33199, U.S.A. Stinger@fairchildgarden.org

ABSTRACT. As a result of recent revisionary studies in the genus, a new species, *Homozeugos conciliatum*, is described from the central highlands of Angola in western Africa. It is differentiated from the more common *Homozeugos eylesii* C. E. Hubbard by a much shorter ligule, inrolled leaves, and longer microhairs on the abaxial surface of the leaves with a lower ratio of basal cell length to distal cell length. A full description of the new species and its predicted habitat is given.

Key words: Angola, *Homozeugos*, Poaceae.

Recent revisionary (Guala, 1997, 1998a, 1998b) and biogeographic (Guala, 1998a, 1998b, 2000) studies by the author on the genus *Homozeugos* (Panicoideae: Andropogoneae) have shown that a specimen collected in the central highlands of Angola in 1969 during the war for independence is of a species previously unknown to science. The current civil war has precluded new fieldwork on the species for the last 26 years, but sufficient herbarium material exists from the original collection to determine that it is indeed a previously undescribed species. A description of the predicted habitat is also given here. It is based on extrapolation from a GIS database of 44 layers of spatial environmental parameters for the point of collection. The original data for the GIS composite were drawn from the NOAA-EPA Global Ecosystems Database Project (1992). A complete discussion of the materials and methods is given by Guala (1998a, 2000).

Homozeugos conciliatum G. F. Guala, sp. nov.

TYPE: Angola. Huambo: Chianga, "frequente no terreno que ladeia, á esquerda, a estrada para a Chianga," ca. 1710 m, 14 Apr. 1969, B. Teixeira 13216 (holotype, LISC; isotype, LISJC). Figure 1.

Homozeugos eylesii affine sed ligulis minoribus, laminis involutis et micropilis longioribus differt.

Caespitose perennial. Rhizomes generally short and knotty. Bud scales sparsely pubescent, becoming shiny indurate and then stramineous. Culms ca. 1 m tall, 1.3–3.6 mm wide; nodes villous, 1.8–3.7 mm wide. Leaves green; sheath shorter than the lamina in the midculm leaves, 14–47.2 cm long; lamina inrolled, glabrous to sparsely hirsute, 13–59 cm long (excluding the most distal leaf), 2.3–5 mm wide (when flattened), linear to lanceolate with a prominent midvein; margin minutely antrorsely scabrous; ligule 4–5.4 mm long on the penultimate leaf, 1.4–5.4 mm long overall, domed to truncate. Inflorescence of 4 to 5 racemose segments; each segment 8.5–14.5 cm long with 20 to 35 spikelets; rachis segments between the spikelet pairs 5.35–5.6 mm long; pedicels 4.3–5.2 mm long, hairs to 2.5 mm. Sessile and pedicellate spikelets weakly appressed to the rachis; callus 1.2–1.4 mm long, pungent, velutinous, with the hairs becoming progressively longer distally, to 3 mm; first glume 7.3–8 mm long, 2.3–2.4 mm wide, the lamina with 2 minutely scabrous keels appearing as the margins, each ca. 0.6 mm wide distally grading into the margin basally; the abaxial surface of the lamina glabrate to villous with hairs to 3.6 mm long; second glume 7.3–8.1 mm long, symmetrical, similar in texture to the first glume, glabrous to villous with hairs to 1.7 mm long; sterile lemma 5.5–5.7 mm long, hyaline, ovate to linear, 2-keeled, the apex acute to minutely bifid, the margins villous; fertile lemma 6.2–7 mm long, bifid at the apex with teeth ca. 0.3 mm long, the awn straight to geniculate, 15–24 mm long, hirsute to villous with hairs to 0.5 mm long; palea 1.1–1.2 mm long; anthers 3.9–4.3 mm long, dehiscing from teardrop-shaped apical pores; lodicules 0.4–0.5 mm long. Diaspore composed of

→

Figure 1. *Homozeugos conciliatum* G. F. Guala. —A. Habit. Bar = 1 cm. —B. Transverse section of a portion of the leaf lamina. Bar = 1 mm. —C. Dissection of a spikelet: left to right; first glume, second glume, sterile lemma, fertile lemma, pistil, lodicule, palea, lodicule, three anthers, callus. Bar = 1 mm. Drawn from Teixeira 13216 (holotype, LISC; isotype, LISJC).



the hermaphrodite spikelet with its awn. Caryopsis ca. 5 mm long.

Leaves in cross section involute, with generally 3 sizes of bundles: the largest and midsize bundles with bundle caps on both the adaxial and abaxial sides and spanning the thickness of the leaf, the largest with conspicuously large vessels, the midsize bundles in sets of 1 to 3 intercalated between each pair of large bundles, without conspicuously large vessels, the smallest bundles intercalated in sets of 1 to 3, between each pair of midsize bundles, these always with an abaxial bundle cap, but without an adaxial one. Bulliform cells in discrete fan-shaped groups of ca. 5 to 10, in a single adaxial layer with smaller ones stacked and progressively smaller abaxially forming narrowly triangular arms between the vascular bundles, sometimes containing tannin-like substances. Both surfaces of the lamina similar in appearance with respect to the costal areas, smooth, occasionally with a few hooked prickles near the margins, the stomata in lines alternating with single or rarely pairs of fusiform cells; bicellular microhairs generally present on both surfaces at the edges of the costae; abaxial microhairs 54.24–55.14 μm long with their basal cell 22.97–23.86 μm long and their distal cell 31.26–31.28 μm long, the ratio of basal to distal cell length 0.73–0.76; adaxial microhairs 45.64–59.95 μm long with their basal cell 20.71–29.6 μm long and their distal cell 24.92–31.29 μm long, the ratio of basal to distal cell length 0.84–0.98; straight trichomes to ca. 5 mm long also sometimes present. Silica bodies occurring singly in cells that occur singly or in lines, dumbbell- to 4-leaf-clover-shaped.

Phenology. The type, collected in April, is at anthesis.

Distribution and habitat. *Homozeugos conciliatum* is known from a single locality on the road to Chianga in Huambo Province at 1710–1715 m elevation. Estimated coordinates: 12.80°S latitude and 15.75°W longitude. Because there is only one known locality for the species, a single point (the type locality) was queried in the GIS database (see Guala, 2000, 1998a) and the values are presented here. Habitat parameters: the percentage of possible sunshine hours that are actually sunny in Jan. 36%, Feb. 40%, Mar. 38%, Apr. 49%, May 69%, June 80%, July 76%, Aug. 71%, Sep. 56%, Oct. 43%, Nov. 35%, Dec. 35%. The mean monthly precipitation in Jan. is 219 mm, Feb. 179 mm, Mar. 238 mm, Apr. 146 mm, May 14 mm, June 0 mm, July 0 mm, Aug. 1 mm, Sep. 20 mm, Oct. 121 mm, Nov. 228 mm, Dec. 233 mm; with a mean annual

precipitation of 1311 mm. The mean monthly temperature in Jan. is 19.7°C, Feb. 19.9°C, Mar. 19.9°C, Apr. 19.8°C, May 18.2°C, June 16.4°C, July 16.7°C, Aug. 19°C, Sep. 21°C, Oct. 20.9°C, Nov. 20°C, Dec. 19.8°C; with a mean annual temperature of 19.2°C, and a surface albedo in Oct. of 18%. The generalized vegetation index (GVI) in Jan. 1990 was 134, in July 1990, 124. The percentage of sand in the top 1 m of soil was 51%; percentage of silt in the top 1 m of soil 17%; percentage of clay in the top 1 m of soil 32%. In summary, the habitat is characterized by a very dry and sunny winter (May–September), with a warm wet growing season.

Eponymy. The name is a plea for peace and reconciliation in Angola. The home of this species in Huambo is the site of some of the most intense fighting amidst the general hostilities paralyzing Angola (INS Resource Information Center, 2000; Standley, 1999). As a result of the war, scientific research on the country's biota has been stifled for decades.

DISCUSSION

Homozeugos conciliatum, known only from the type collection, is clearly distinct from its five congenitors (Guala, 1998a, 1998b) and easily recognized by its short ligules and involute leaves. It was not mentioned by Clayton (1973), and he apparently never saw the collection.

In a cladistic analysis of the entire genus (Guala, 1997, 1998a), *H. conciliatum* shares long distal cells of the adaxial microhairs only with *Homozeugos katakton* Clayton, a generally much larger species that has awns 45–76 mm long, culms 1.2–1.9 m tall, glumes > 9 mm long, and flat leaves 2.8–6.3 mm wide. Although *H. conciliatum* most closely resembles *H. eylesii* morphologically, that species is known only from several localities in Zambia, Democratic Republic of Congo, Tanzania, and Malawi, in contrast to all other species of *Homozeugos*, which are restricted to Angola or (in the case of *H. katakton*) Angola and western Zambia.

Acknowledgments. I am grateful to the curators of LISC and LISCJ for their loans and to the staff of FLAS for housing and maintaining those loans during my studies at the University of Florida. I also thank Walter Judd for support and encouragement during this work and the staff of the University of Florida Electron Microscopy Core Facility for assistance with the SEM work that was integral to this study.

Literature Cited

- Clayton, W. D. 1973. A new species of *Homozeugos* (Gramineae). *Garcia de Orla* 1: 11–12.
- Guala, G. F. 1997. The integration of cladistic analyses with GIS in the revision of two genera of tropical grasses (Poaceae), *Agenium* Nees (from South America) and *Homozeugos* Stapf. (from Africa). *Amer. J. Bot.* 84: 199. [Abstract.]
- . 1998a. Revisions of *Agenium* and *Homozeugos* (Poaceae: Andropogoneae): Integrating Cladistic Analysis and Geographic Information Systems. Dissertation, University of Florida, Gainesville.
- . 1998b. The relation of spatial environmental parameters to phylogeny and species distribution in *Agenium* and *Homozeugos* in South America and Africa. *Amer. J. Bot.* 85: 104. [Abstract.]
- . 2000. The relation of space and geography to cladogenic events in *Agenium* and *Homozeugos* (Poaceae: Andropogoneae) in South America and Africa. Pp. 159–166 in S. W. L. Jacobs & J. Everett (editors), *Grasses: Systematics and Evolution*. Volume 2 of *Proceedings, 2nd International conference on Comparative Biology of Monocotyledons*, Sydney, Australia 1998. CSIRO, Victoria.
- INS Resource Information Center. 2000. Angola: Current Political and Human Rights Conditions in Angola. Response to information request number AG001003.EXM. US Immigration and Naturalization Service Resource Information Center, Washington, D.C.
- NOAA-EPA Global Ecosystems Database Project. 1992. Global Ecosystems Database Version 1.0. User's Guide, Documentation, Reprints, and Digital Data on CD-ROM. USDOC/NOAA National Geophysical Data Center, Boulder, Colorado.
- Standley, J. 1999. "War and misery in Huambo." BBC Online network 13 Aug. 1999.



Guala, Gerald F. 2002. "A New Species of Homozeugos (Poaceae) from Angola." *Novon a journal of botanical nomenclature from the Missouri Botanical Garden* 12, 196–199. <https://doi.org/10.2307/3392955>.

View This Item Online: <https://www.biodiversitylibrary.org/item/14672>

DOI: <https://doi.org/10.2307/3392955>

Permalink: <https://www.biodiversitylibrary.org/partpdf/122118>

Holding Institution

Missouri Botanical Garden, Peter H. Raven Library

Sponsored by

Missouri Botanical Garden

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.