

## A NEW SPECIES OF *OCEPHALUS* (LAMIACEAE) FROM GOIÁS, BRAZIL

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A new species, *Oocephalus pubescens* A.Soares & Harley, from Chapada dos Veadeiros, Goiás, Brazil, is described and illustrated. The characteristics that distinguish it from a similar taxon, *Oocephalus foliosus*, are listed, and comments on its distribution and an occurrence map are provided.

*Keywords.* Campo rupestre, Chapada dos Veadeiros, Hyptidinae, *Hyptis*.

### INTRODUCTION

The genus *Oocephalus* (Benth.) Harley & J.F.B.Pastore was proposed by Harley & Pastore (2012) in the most recent generic revision of subtribe Hyptidinae of the Lamiaceae, based on morphological evidence and the results of the first phylogenetic analysis of the subtribe (Pastore et al., 2011). The species of the genus *Oocephalus* were formerly included by Epling (1949) in different subsections of *Hyptis* sect. *Polydesmia* Benth. (subsects *Glomeratae* Benth. and *Oocephalus* Epling). Currently, *Oocephalus* comprises 18 species, 17 of which are endemic to the campos rupestres vegetation of the Serra do Espinhaço (a mountain range located in the Brazilian states of Bahia and Minas Gerais) and the Cerrado of central Brazil (Goiás state and the Federal District; Harley, 2015). The only widely distributed species is *Oocephalus oppositiflorus* (Schrank) Harley & J.F.B.Pastore (= *Hyptis glomerata* Mart. ex Schrank), which extends the range of the genus to eastern Bolivia and Paraguay (Harley & Pastore, 2012).

*Oocephalus* can be recognised by the possession of an inflorescence of congested, pedunculate or sessile cymes, never hemispherical or globose but slightly ovoid in form, that are few to many flowered and often enveloped by an involucre of broad, ovate or lanceolate bracteoles, which are rarely narrower and not enveloping the cymes [in *Oocephalus hagei* (Harley) Harley & J.F.B.Pastore] (Harley, 2014). Also, the flowers are sessile or subsessile, the corollas usually with an elongate tube and short lobes, the lips unmarked by lines or blotches (Harley, 2015).

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During extensive fieldwork and herbarium specimens analyses, we found an undescribed species from the region of the Chapada dos Veadeiros National Park (Goiás state, Brazil). This is described and illustrated here.

#### SPECIES DESCRIPTION

##### ***Oocephalus pubescens* A. Soares & Harley, sp. nov.**

*Oocephalus pubescens* is similar to *O. foliosus* (A. St.-Hil. ex Benth.) Harley & J. F. B. Pastore in the leaf shape, leaf apex and possession of an inflorescence with short peduncles, but differs in having stems, leaves and cymes covered with dense, short white hairs, sessile leaves that are congested on the distal parts of branches and caducous on the lower parts, and cymes with subsessile peduncles (up to 2.4 mm long versus 4 mm long in *O. foliosus*). – Type: Brazil, Goiás, Alto Paraíso de Goiás, Morro da Baleia, situado no Parque Nacional da Chapada dos Veadeiros. Campo rupestre com solo arenoso, 1332 m, 14°07'51.01''S, 47°39'29.99''W, 18 xi 2018, Soares, A. S. et al. 567 (holo UFRN; iso CEN, CTBS, HUEFS). **Figs 1, 2.**

Erect shrub or subshrub, weakly aromatic, *stems* arising from well-developed wood rootstock (xylopodium), 0.8 m tall. *Branches* tomentose, densely covered with short white hairs and with scattered sessile glands. *Leaves* caducous below and congested on distal portions of branches, 0.9–2.5 × 0.6–1.3 mm, opposite decussate, sessile, ovate, cartaceous, with semicraspedodromous venation, margin crenate with slightly recurved lobes, adaxial surface green, covered with soft, short white hairs, abaxial surface paler, indument the same as on the adaxial surface but more concentrated between veins, apex rounded, base rounded to slightly cordate. *Inflorescence* a subsessile ovoid cyme in the axil of foliaceous bracts, cyme 1.3 × 2.1 cm, congested, peduncle up to 2.4 mm long, 5-flowered; *bracteoles* forming an involucre at the base of the cyme, *outer bracteole* green with the apex slightly purple, 1.4 cm long, ovate, densely covered with short white hairs on dorsal portion, ventral portion glabrous; *inner bracteole* 1.1 cm long, slightly lanceolate, less concave than the outer, covered with short white hairs. *Flower* sessile; *calyx at anthesis* 1.1 cm long, green, 0.4–0.5 mm long, campanulate, membranous, densely covered with short white hairs, glabrous within, lobes green, 0.7 mm long, ensiform, membranous, covered with short white hairs; *calyx at fructification* brown, 3–3.2 mm long, campanulate, cartaceous, covered with short white hairs, glabrous within, lobes 5 mm long, narrowly triangular, cartaceous; *corolla* pale purple, tube 1.2–1.4 cm long, 1.4 mm in diameter near the base, 2.5 mm in diameter near the throat, covered with short white hairs along the tube, lobes 2.6–3.4 mm long, apex rounded; *stamens* with filaments pilose, 3.5 mm long, *anthers* yellow, 0.8–1 mm long; *gynoecium* glabrous, style 1.7 mm long, *stigma* bilobed with short lobes. *Nutlets* not observed.

*Distribution.* Brazil, Goiás state: Chapada dos Veadeiros, near the town of Alto Paraíso de Goiás (**Fig. 3**).

*Habitat and ecology.* In campo rupestre, 1200 m, growing in sandy dry soil with rocks, on the southeastern slope of Morro da Baleia, near the road GO-239.



FIG. 1. *Oocephalus pubescens* sp. nov. A, Habit; B, branch, cauline leaves and flower; C, flower detail. (Photographs: Arthur de Souza Soares.)

*Flowering.* The new species was collected with flowers in January, March and November.

*Etymology.* The specific epithet refers to the dense, short and soft indument of the species, which characterises it.

*Provisional IUCN conservation assessment.* *Oocephalus pubescens* is known only from the Chapada dos Veadeiros National Park region, a federal conservation unit with high levels of plant species richness and endemism (Harley, 2013). The extent of occurrence and the area of occupancy were calculated as 198,245 km<sup>2</sup> and 12 km<sup>2</sup>, respectively, using the online software GeoCat (Bachman, 2011). The type locality of the species is used for ecotourism by people visiting the town of Alto Paraíso de Goiás and is vulnerable to

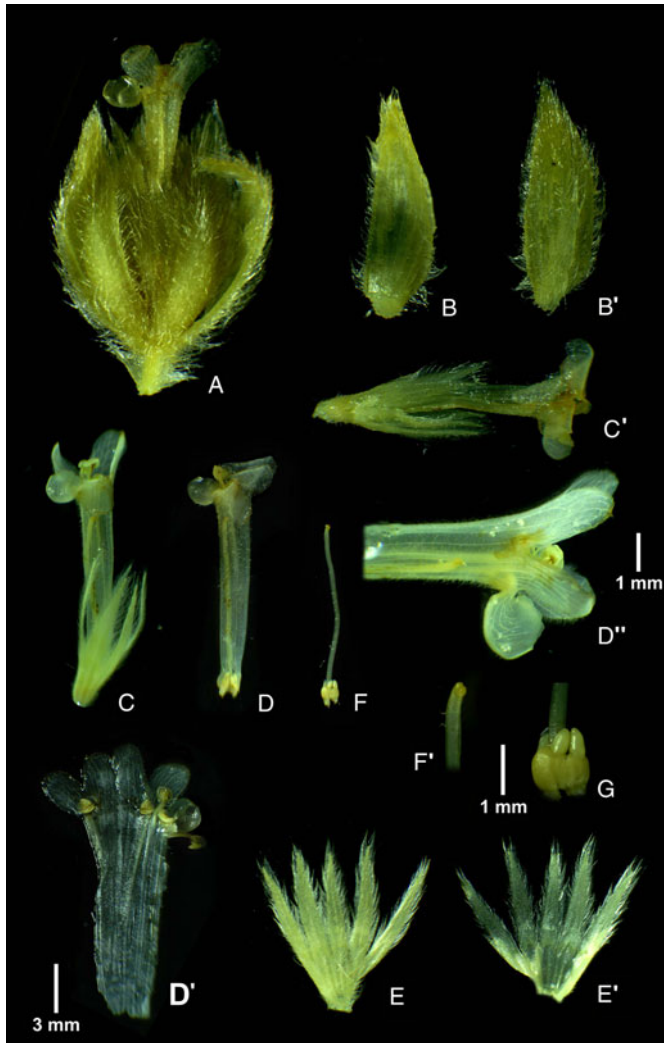


FIG. 2. Reproductive parts of *Oocephalus pubescens* sp. nov. A, Cyme; B and B', outer bracteole, ventral view and dorsal view, respectively; C and C', flower; D, D' and D'', corolla, lobes and open corolla, respectively; E and E', calyx at anthesis, inner and outer side, respectively; F and F', gynoecium and stigma lobes, respectively; G, ovary lobes. (Photographs: José Floriano Barêa Pastore.)

anthropic actions. Although hypothetically a risk assessment could be calculated using the GeoCat tool, little is known about the population in this area, and therefore it is not appropriate to evaluate its risk under criterion D (estimated population), which requires the number of individuals in the population to be assessed (IUCN Standards and Petitions Subcommittee, 2017). Therefore, we decided to classify the species as Data Deficient (DD), considering also the low number of records.

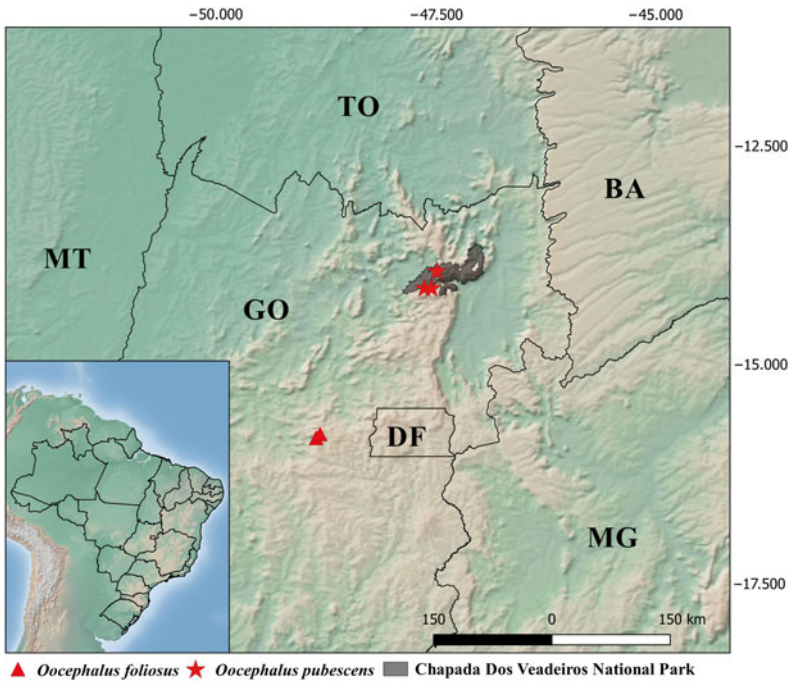


FIG. 3. Distribution map for *Oocephalus pubescens* sp. nov. BA, Bahia; DF, Federal District; GO, Goiás; MG, Minas Gerais; MT, Mato Grosso; TO, Tocantins.

*Additional specimens examined.* Brazil. **Goiás:** Alto Paraíso de Goiás, Chapada dos Veadeiros, c.20 km N of Alto Paraíso, 21 iii 1971, Irwin, H.S. et al. 32887 (K, NY, P and UB, the first three seen by photograph); *ibid.*, 5 km de Alto Paraíso de Goiás, 24 i 1979, Gates, B 7 (UB).

#### DISCUSSION

Material of this species was first provisionally identified by Harley in 1973, before *Oocephalus* was separated from *Hyptis* (see Harley & Pastore, 2012). Harley made the first collection with Irwin in 1971. He believed, at that time, that it was almost certainly a new species related to '*Hyptis foliosa* A.St.-Hil. ex Benth.', but because the material lacked corollas and possessed only old inflorescences, he was unable to reach a definitive conclusion. The recent collection with flowers at anthesis now allows a formal description to be made. *Oocephalus pubescens* can be distinguished by the white, dense and soft indument that covers branches, inflorescences and leaves, which are subsessile and caducous below and more congested on distal portions of stems (see Fig. 1), whereas *O. foliosus* is covered with much shorter and less densely distributed hairs, with leaves petioled and more loosely distributed. The cymes of *Oocephalus pubescens* are subsessile (see Fig. 2), whereas *O. foliosus* has a short pedunculate cyme (inflorescence peduncle c.4 mm long).

Although these species occur in the same state, Goiás, they are not sympatric. So far, *Oocephalus pubescens* has been collected only from the Chapada dos Veadeiros National Park, whereas *O. foliosus* is known only from its type locality, the Serra dos Pirineus (a mountain formation situated southwest of Chapada dos Veadeiros) and surrounding areas (R. M. Harley, personal observation). Restricted occurrence in the Chapada dos Veadeiros region is a common pattern of distribution in angiosperms, as noted by Simon & Proença (2000). In the subtribe Hyptidinae this pattern is frequent, with several species from different genera being endemic to the region, such as *Cyanocephalus digitatus* (Harley) Harley & J.F.B.Pastore, *C. tagetifolius* (Harley) Harley & J.F.B.Pastore, *Hypenia paradisi* (Harley) Harley and *H. subrosea* (Harley) Harley, as well as recently described species such as *Gymneia chapadensis* Harley (Harley, 2013), *Hyptidendron roseum* Antar, Harley & J.F.B.Pastore (Antar et al., 2018) and *Eriope paradise* Schlieuwe, H.D.Ferreira, D.Graciano-Ribeiro & M.H.Rezende (Schlieuwe et al., 2017).

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#### REFERENCES

- ANTAR, G. M., HARLEY, R. M., PASTORE, J. F. B. & SANO, P. T. (2018). Novelities in *Hyptidendron* (Hyptidinae – Lamiaceae) from Brazil: a new species and a rediscovery. *Brittonia* 70(1): 1–9.
- BACHMAN, S., MOAT, J., HILL, A. W., DE LA TORRE, J. & SCOTT, B. (2011). Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool. In: SCOTT, V. & PENEY, L. (eds) *E-Infrastructures for Data Publishing in Biodiversity Science*. *ZooKeys* 150: 117–126.
- EPLING, C. (1949). Revisión del género *Hyptis* (Labiatae). *Revista Mus. La Plata, Secc. Bot.* 7: 153–497.
- HARLEY, R. M. (2013). Notes on the genus *Gymneia* (Lamiaceae: Ocimeae, Hyptidinae) with two new species from Brazil. *Phytotaxa* 148(1): 57–64.
- HARLEY, R. M. (2014). Four new taxa of *Oocephalus* (Hyptidinae: Lamiaceae) from Bahia, Brazil. *Kew Bull.* 69(4): 1–10.
- HARLEY, R. M. (2015). “*Oocephalus lythroides*” (Lamiaceae: Ocimeae: Hyptidinae) from the Distrito Federal of Brazil is a new species: *Oocephalus graziellae*. *Kew Bull.* 70(2): 1–6.
- HARLEY, R. M. & PASTORE, J. F. B. (2012). A generic revision and new combinations in the Hyptidinae (Lamiaceae), based on molecular and morphological evidence. *Phytotaxa* 58: 1–55.
- IUCN STANDARDS AND PETITIONS SUBCOMMITTEE (2017). *Guidelines for Using the IUCN Red List Categories and Criteria, version 13*. Online. Available: <http://www.iucnredlist.org/documents/RedListGuidelines.pdf>

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- PASTORE, J. F. B., HARLEY, R. M., FOREST, F., PATON, A. J. & VAN DEN BERG, C. (2011). Phylogeny of the subtribe Hyptidinae (Lamiaceae tribe Ocimeae) as inferred from nuclear and plastid DNA. *Taxon* 60: 1317–1329.
- SCHLIEWE, M. A., FERREIRA, H. D., REZENDE, M. H. & GRACIANO-RIBEIRO, D. (2017). Two new species of *Eriope* (Lamiaceae) from Goiás state, Brazil. *Phytotaxa* 291(4): 264–274.
- SIMON, M. F. & PROENÇA, C. (2000). Phylogeographic patterns of *Mimosa* (Mimosoideae, Leguminosae) in the *Cerrado* biome of Brazil: an indicator genus of high-altitude centers of endemism? *Biol. Conservation* 96(3): 279–296.

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