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# *Marsypianthes tubulosa*, a new species of Hyptidinae (Lamiaceae) from the Brazilian Cerrado

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## ABSTRACT

After a brief historical account of the genus, a new species, *Marsypianthes tubulosa*, from the Brazilian state of Tocantins is described and illustrated. The new species is similar to *M. chamaedrys* (Vahl) Kuntze, the most polymorphic species of the genus. It is distinguished from the other species of the genus by its habit and characters of the cyme, calyx and corolla. Comments on the taxonomy and distribution of the new species are provided, as well as a conservation assessment, distribution map, photographs and a black and white illustration.

**Keywords:** Brazilian flora, Labiatae, *Marsypianthes chamaedrys*, Ocimeae, taxonomy

## Introduction

The genus *Marsypianthes* is a member of the large, Neotropical subtribe Hyptidinae (Harley *et al*. 2004), in the tribe Ocimeae, which contains 19 genera and around 400 species. The main centres of diversity of the group are primarily in South America, in the Andes and primarily in Brazil, where most of the genera occur (Harley pers. comm.). In the molecular analysis of the subtribe (Pastore *et al*. 2011), the genus was found to be sister to *Asterohyptis*, a small genus restricted to Mexico and Central America. It is probable that both these genera may have originated in this region, which today, *Marsypianthes* only represented there by the one, most widespread, species.

The genus *Marsypianthes*, first published by Bentham (1833), in his monograph of the family Labiatae, was based on the originally given by Martius, in a most probably on unpublished manuscript. At that time, Bentham recognized only a single species, *Marsypianthes hyptoides*, which had a wide distribution in the New World tropics. This name was subsequently replaced by *M. chamaedrys*, which was based on a much earlier name, *Clinopodium chamaedrys*. *Marsypianthes chamaedrys* is a species with an extensive synonymy, which Bentham (1848) listed. Apart from those names mention earlier, he cited *Hyptis inflata*, *H. lurida*, *H. pseudochamaedrys*, *Marsypianthes secundiflora*, and *M. sessiliflora*. The large number of synonyms reflects the morphological diversity of this species. Although Bentham originally published only one species, he noted that he had seen what he believed were other species in the Vienna Herbarium, but had no time to study them. This situation he corrected in his later treatment of the family in De Candolle's Prodromus (see Bentham 1848), when he described two new species, both from Brazil (*M. montana* and *M. foliolosa*), along with six varieties of *M. chamaedrys*. Since that date, only three other species have been described, two species from South America: *M. hassleri*

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(1907) from Paraguay, Argentina and Southern Brazil, and *M. burchellii* (1936), from Goiás state, Brazil. A third species, *M. arenosa* was described from Mexico (Brandegee 1924), but the examination of an isotype in the Smithsonian Institute Herbarium, revealed that it was indistinguishable from *M. chamaedrys* and it has now been placed in synonymy (Harley & Pastore 2012; Lara-Cabrera *et al*. 2016).

The genus is closely allied to other members of subtribe Hyptidinae but is easily distinguished by a number of characters. The species are subshrubs or perennial herbs, rarely shrubs, often geoxylic, aromatic and glandular-viscid, with uniseriate gland-tipped trichomes. The gland is slightly ovoid in shape, which differentiates it from other genera, in which the gland is spherical. The inflorescence is thyrsoid, composed of axillary, pedunculate or sessile cymes, which are 1–3 to many-flowered, the latter forming a spherical head; the bracts and bracteoles are narrowly elliptic-lanceolate to linear, which in many-flowered cymes form a lax involucre. The flowers are shortly pedicellate, the calyx infundibuliform, actinomorphic, 5-lobed, and sometimes purple-tinged, conspicuously so in *M. burchellii*. The calyx lobes are equal, broadly to narrowly deltate, with the apex acute to subulate, erect or connivent at first and often becoming spreading to reflexed in fruit, especially in *M. chamaedrys*. The corolla has a straight, cylindrical tube, and is strongly 2-lipped, 5-lobed (2/3), violet-blue, lilac or rarely creamy yellow (in *M. burchellii*) and possesses the explosive pollination mechanism characteristic of the subtribe. The anterior lip of the corolla has a median lobe much shorter than others, with the lateral lobes directed forward; the stamen filaments are hairy. The gynoecium has a unique structure, within the subtribe, with its style jointed just level with the ovary, the distal part deciduous and with a persistent quadrangular base fused to the four developing nutlets along their inner face; there is a well-developed disc, almost encircling the ovary; nutlets cymbiform, dorsally smooth, convex, with the ventral surface fused to the style base. On separation the nutlets are concave, with a thin, involute, laciniate margin. The convex dorsal surface is weakly mucilaginous. Two species have been examined cytologically and found to have $2n = 30$ (Harley & Heywood 1992). The five species at present recognized, are restricted to upland savannas in Brazil, Paraguay and Argentina, with the widespread, weedy *M. chamaedrys*, occurring primarily in anthropic habitats, especially disturbed savanna, from Mexico and Caribbean, southwards to Peru, Bolivia and north of Argentina (Harley & Pastore 2012). The polymorphism of this species, with its wide range of habit, leaf shape, and indumentum is well known. Perhaps due to the many collections of the confusingly variable species, there have been few recent taxonomic papers, except for the excellent study by Hashimoto & Ferreira (2020), who concluded that the genus required more detailed studies, involving anatomy, phytochemistry, ecology and molecular studies, as well as further field collections to aim at a better understand of the morphology. Undoubtedly such studies will reveal the presence of several new taxa in Brazil.

In this paper, we present one new species of *Marsypianthes* from the Brazilian Cerrado, providing a full description, illustration and its conservation assessments, as well as comments on its morphological relationship with similar taxa.

## Materials and methods

The morphological description of the new species was made from field observations and studying specimens housed on the following herbaria: ALCB, BM, CEN, CEPEC, CTBS, HST, HUEFS, IBGE, IPA, JPB, K, P, RN, UB, UFRN and W (acronyms according to Thiers, continuously updated). The terminology of morphological description follows Radford (1974) and Harris & Harris (2001), the indumentum descriptions were based on the Leaf Architecture Working Group (1999) and for specific nomenclature specialized bibliography (*e.g.,* Harley & Pastore 2012 and Epling 1936). The conservation assessments were inferred following the IUCN Red List criteria (IUCN 2012).

## Results

### *Taxonomy*

*Marsypianthes tubulosa* A.Soares, J.F.B.Pastore & Harley sp. nov. Type: BRAZIL, Tocantins: Natividade, 11°42'05'' S – 47°43'24'' W, 340 m elev., 16 Jan. 2008 [fl+fr], Pastore, J.F.B., Harley, R.M. and Suganuma, E. 2481 (holotype: HUEFS!; isotype: UFG). (Figs. 1, 2).

The new species is similar to *Marsypianthes chamaedrys*, differing from it by the erect and spreading branches, wider cyme, with 1.8–3.1 cm diam. (*vs*. 0.8–1.4 cm diam.), paucity of flowers in the cyme (6–7-flowered *vs*. 7–10-flowered), which do not form a globose head, calyx at anthesis 1.2–1.4 cm long (*vs*. 0.5–0.7 cm long) and corolla tube 1.1–1.2 cm long (*vs*. 0.4–0.5 cm long).

Erect subshrub, 1.5 m tall, aromatic, stem slightly quadrangular, with spreading branches arising from a well-developed woody rootstock (xylopodium), viscous with an indumentum of glandular uniseriate trichomes, the terminal gland cell with a ciliate projection. Leaves opposite, petioled, petiole usually 0.6–1.4 cm long, lamina 1.8–6.4 × 1.1–3.2 cm, ovate to lanceolate, margin crenate, chartaceous, dark green, discolorous with the abaxial surface paler, apex acute, base attenuate, adaxial surface with sparse, long glandular trichomes, sessile glands, semicraspedodromous venation, the veins sunken, both surfaces sparsely covered with glandular trichomes specially concentrated on veins. Inflorescence thyrsoid composed by a pedunculate cyme rising from the axil of a leaf-like bract, peduncle 8.7–9.0 mm long, cyme 1.7–2.3 × 1.8–3.1 cm, covered with


**Figure 1.** *Marsypianthes tubulosa*. **A–B**. Flowering branch. **C**. Cyme side view. **D**. Calyx at anthesis. **E**. Calyx indumentum detail. **F**. Dissected corolla. **G**. Style.

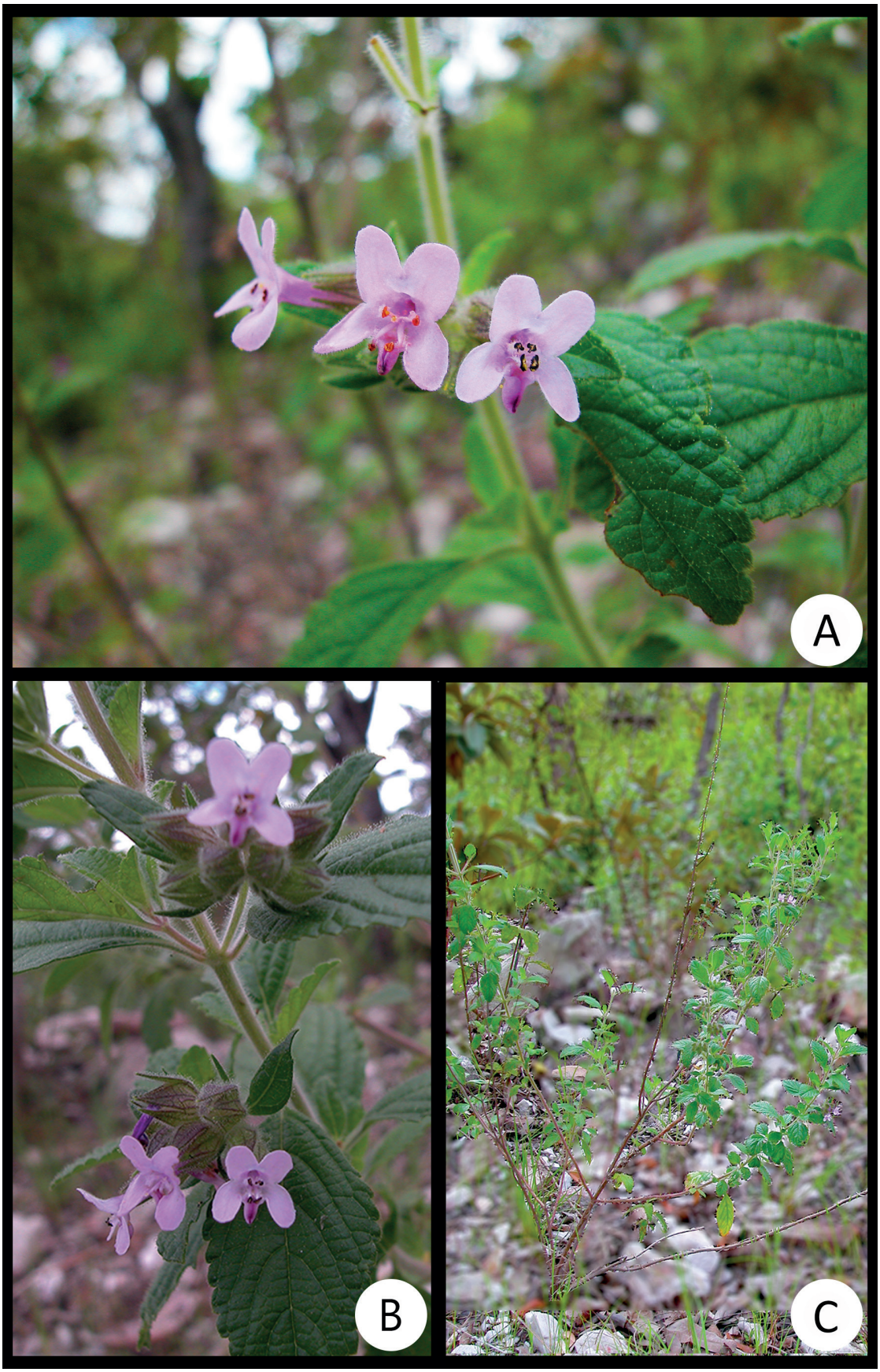


**Figure 2.** *Marsypianthes tubulosa*. **A**–**B**. Cyme detail. **C**. Habit. (Photos by Raymond Harley).

sparse, short trichomes, 6–7-flowered, not forming a sub-globose head; bracteoles 1.0–1.1 cm long, lanceolate, slightly concave towards apex with ciliate margin. Flower pedicellate, with pedicel 2.0 mm long; calyx at anthesis green, being slightly purple towards apex, 1.2–1.4 cm long, campanulate, membranous, covered with long sparsely glandular trichomes, glabrous within, tube 7.0–8.0 mm long, lobes slightly purple, equal, 5.0–6.0 mm long, slightly overtopping the corolla tube, deltate, membranous, margins ciliate, apex shortly acuminate; fruiting calyx brown, 1.1–1.3 cm long, campanulate, chartaceous, sparsely covered with few long hairs, glabrous within, tube 6.2–7.0 mm long, length of lobes as at anthesis, deltate, slightly reflexed, chartaceous; corolla pale lilac, tube 1.1–1.2 cm long, 2.0 mm diam. near base, 1.8 mm diam. near throat, externally glabrous, except for the dorsal part of the lobes, which is sparsely covered with few short hairs and slightly hirsute internally, lobes 3.0–3.5 mm long, apex rounded; stamens with filaments slightly hirsute, 6.2 mm long, anthers 2.4 mm long; gynoecium with style 1.2 cm long, glabrous, stylopodium persistent, stigma bifid, ovary 4-lobed, 1.0 mm diam. Nutlets not observed.

**Distribution and ecology–** *Marsypianthes tubulosa* seems to be endemic to the Cerrado. It was collected in an area knowing as "campo sujo" (a physiognomy of Cerrado composed essentially by forest and rupestrian elements) with sandy white soils, in an elevation of 340 m in the municipality of Natividade, in Tocantins state, central Brazil. (Fig. 3).

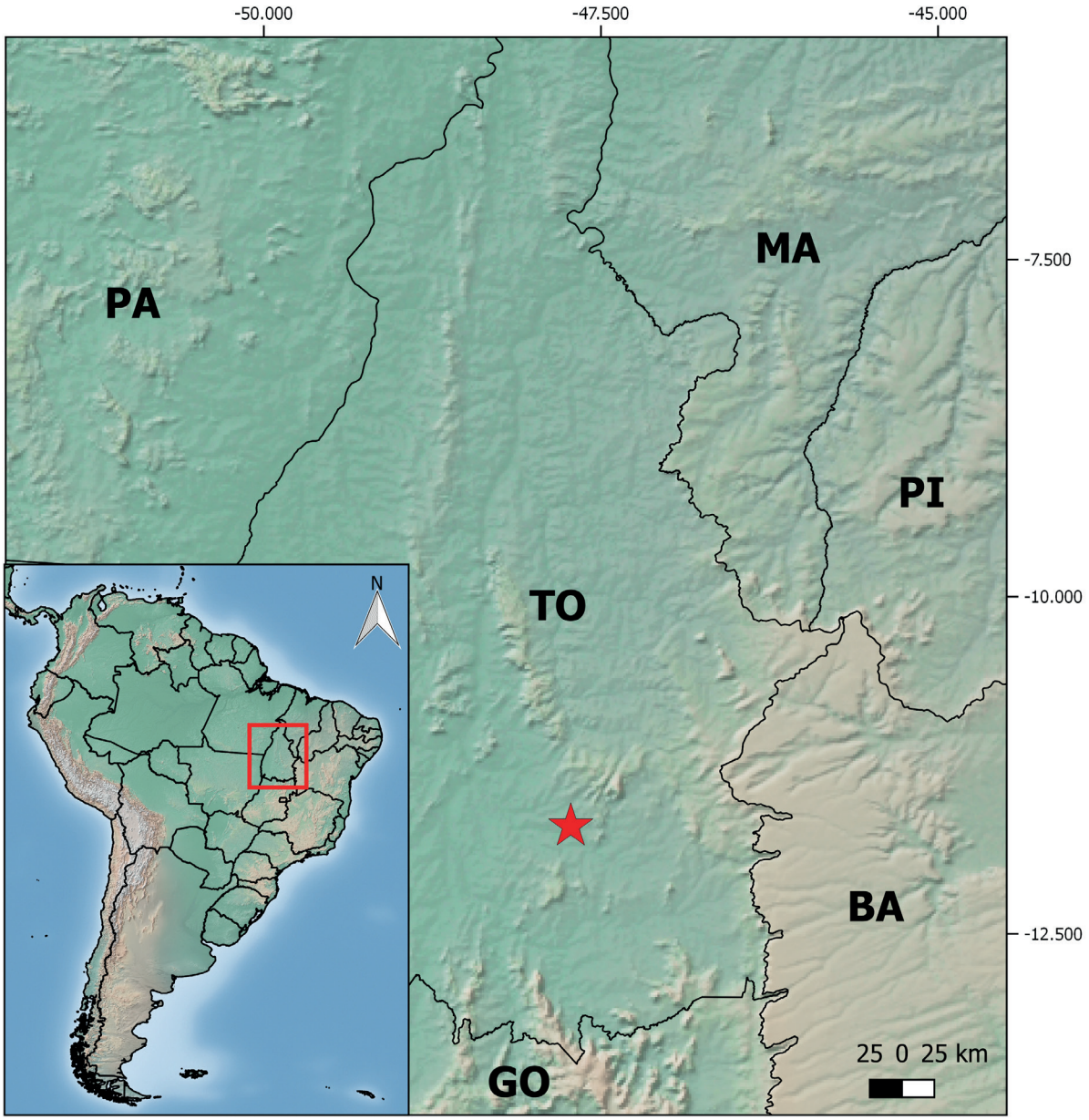


**Figure 3.** Distribution map of *Marsypianthes tubulosa*. BA: Bahia; GO: Goiás; MA: Maranhão; PA: Pará; PI: Piauí; TO: Tocantins.

**Flowering and fruiting–** The species was collected with flower in January. Although fruiting calyx was present, the nutlets were not observed.

**Conservation status–** The new species is known only for the type collection. Therefore, we decided to classify the species as Data Deficient, as more botanical efforts could reveal the real extent of occurrence of this species.

**Etymology–** The specific epithet refers to the long corolla tube of the new species, character which is uncommon in the genus and distinguishes it from similar taxa.

## Discussion

*Marsypianthes tubulosa* can be immediately recognized from other species of the genus by its spreading stems, branching habit and the cyme not forming a globose head. This species differs from *M. chamaedrys*, which is the most similar species, by the cyme not forming a globose head and 6–7-flowered (*vs*. globose cyme and 7–10-flowered), longer calyx, both at anthesis and fruit, 1.2–1.4 cm and 1.1–1.3 cm long respectively (*vs*. calyx at anthesis up to 0.5–0.7 cm long and fruiting calyx 0.6–0.8 cm long), corolla pale lilac with tube 1.1–1.2 cm long (*vs*. corolla violet-bluish with tube 0.4–0.5 cm long). From *M. burchellii*, which is the only other species with tall shrubby stems, it can immediately be distinguished by the bright purple calyx at anthesis, with tube 0.9–1.2 cm long and corolla pale creamy-yellow with lobes 2.5–3.0 mm long (*vs* calyx ate anthesis green being slightly purple towards apex, corolla pale lilac, tube 1.1–1.2 cm long and lobes 3.0–3.5 mm long in *M. tubulosa*). In the new species the calyx is predominantly greenish at anthesis, the tube is 7.0–8.0 mm long and corolla is pale lilac with lobes 3.0–3.5 mm long. Also, cyme indumentum of *M. tubulosa* is composed of sparsely and short glandular trichomes, as opposed as to a hirsute indumentum of long hairs on the cyme, as in *M. burchellii*. The new species is similar to another species from the Brazilian Cerrado, *M. foliolosa*, differing from the absent of viscid indument, the peduncle 8.7–9.0 mm long, number of flowers per cyme, 6–7-flowered and calyx tube at anthesis 7.0–8.0 mm long (*vs*. glandular viscid indumentum, peduncle 0.5–0.7 mm long, cyme 2–5-flowered and calyx tube at anthesis 4.0–7.0 mm long in *M. foliolosa*).

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## References

Bentham G. 1833. *Labiatarum genera et species*. London, Ridgeway & Sons.

Bentham G. 1848. Labiatae. In: Candolle AP. (ed.) Prodromus systematis naturalis regni vegetabilis. Paris, Masson.

Brandegee TS. 1924. Plantae Mexicanae Purpusianae, XII. In: Setchell WA, Holman RM. (eds.) University of California Publications in Botany X. Berkeley, University of California Press. p.403-421.

Briquet JH. 1907. Lamiaceae. In: Chodat R, Hassler E. (eds.). Plantae Hasslerianae, soit énumération des plantes récoltées au Paraguay par le Dr. Émile Hassler d'Aarau (Suisse). Bulletin de l'Herbier Boissier 7: 620-621.

Epling C. 1936. Synopsis of South American Labiatae, 3. Repertorium Specium Novarum Regni Vegetabilis Beihefte 85: 169-180.

Harley RM, Atkins S, Budantsev A, *et al*. 2004. Labiatae. *In*: Kadereit JW. (ed.) *The families and genera of vascular plants*. Berlin, Springer. p. 167-275.

Harley RM, Pastore JFB. 2012. A generic revision and new combinations in the Hyptidinae (Lamiaceae), based on molecular and morphological evidence. Phytotaxa 58: 1-55.

Harley RM, Heywood CA. 1992. Chromosome numbers in Tropical American Labiatae. In: Harley RM, Reynolds T. (eds.) Advances in Labiatae Science. Kew, Royal Botanic Gardens. p. 211-246.

Harris JG, Harris MW. 2001. Plant identification terminology: an illustrated glossary. 2nd edn. Utah, Spring Lake Publishing.

Hashimoto MY, Ferreira HD. 2020. Taxonomic study of Marsypianthes Mart. ex Benth. in Brazil Acta Botanica Brasilica. M.Sc. Thesis, Universidade Federal de Goiás, Goiânia.

IUCN – International Union for the Conservation of Nature and Natural Resources. 2012. IUCN Red List categories and criteria: Version 3.1. 2nd edn. Gland, Switzerland, Cambridge, United Kingdom, IUCN. http://cmsdocs.s3.amazonaws.com/keydocuments/Categories_and_Criteria_en_web%2Bcover%2Bbckcover.pdf

Lara-Cabrera SI, Bedolla-García BY, Zamudio S, Domínguez-Vázquez G. 2016. Diversidad de Lamiaceae en el Estado de Michoacán, México. Acta Botanica Mexicana 116: 107-149.

Leaf Architecture Working Group. 1999. Manual of Leaf Architecture – Morphological Description and Categorization of Dicotyledonous and Net-veined Monocotyledonous Angiosperms. Washington, DC, Smithsonian Institution.

Pastore JFB, Harley RM, Forest F, Paton AJ, Berg C. 2011. Phylogeny of the subtribe Hyptidinae (Lamiaceae tribe Ocimeae) as inferred from nuclear and plastid DNA. Taxon 60: 1317-1329.

Radford AE, Dickson WC, Massey JR, Bell CR. 1974. *Vascular plant systematics*. *New York,* Harper & Row.

Thiers B. (continuously updated). Index herbariorum: a global directory of public herbaria and associated staff. New York Garden's Virtual Herbarium. http://sweetgum.nybg.org/ih/herbarium.php?irn=174420 29 Oct. 2018.