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Monograph

We are the Crystal Gems: taxonomic revision of the gem-fruited species of *Commelina* L. (Commelinaceae, Commelinales) and their allies

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Abstract. We present a taxonomic revision of the gem-fruited species of *Commelina* and their allies. We address misapplied names, taxonomic confusion, and undescribed taxa based on a combination of macro- and micromorphological characters, ecological and reproductive data, and preliminary molecular data for *Commelina*. We recognise a total of 14 species, including two new species, *Commelina almandina* M.Pell. & Cornejo sp. nov. and *C. sugariae* M.Pell. sp. nov., and five reestablished ones previously treated as synonyms. We provide an identification key to the gem-fruited species of *Commelina* and their closest allies, as well as complete morphological descriptions, images, comments, and distribution maps for all recognised species. Species are recognised based on a unique combination of discrete vegetative (i.e., root and rhizome morphology, stem posture and growth pattern, leaf-sheath morphology, phyllotaxy, and leaf-blade morphology) and reproductive (i.e., synflorescence architecture, inflorescence position, spathe morphology, upper cincinnus development and flower production, pedicel pubescence, sepal morphology, petal morphology, filaments' posture at anthesis, anthers and antherodes morphology, gynoecium and fruit morphology, fruit dehiscence, and seed morphology) morphological characters. We also provide comments and corrections on the taxonomy, application, and nomenclature of names historically associated with or confused with species of gem-fruited *Commelina*. Finally, we provide a general overview of poorly explored characters and issues plaguing the taxonomy of *Commelina*.

Keywords. *Athyrocarpus*, *Commelinopsis*, dayflowers, Neotropics, *Phaeosphaerion*.

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Introduction

Commelina Plum. ex L. is the largest genus of Commelinaceae Mirb. (Faden 1998; Pellegrini 2019), comprising ca 210 species (POWO 2025; WFO 2025). It is one of the six genera of Commelinaceae (out of the currently recognised 36) to have a cosmopolitan distribution (Faden 1998) and one of the most taxonomically complicated (Faden 2012; Pellegrini & Forzza 2017; Pellegrini 2019). *Commelina* is easily differentiated from the remaining genera of Commelinaceae by its spathaceous basal bract, inflorescences reduced to (1–)2 fasciculate cincinni, absent cincinnus bracts, strongly zygomorphic (i.e., zygomorphic calyx, corolla, androecium, and gynoecium) and enantiostylous flowers, petals mostly sky blue (but sometimes white, lilac or purple, rarely yellow, orange, apricot, or pink), paired petals clawed, (2–)3 posterior staminodes with X-shaped antherodes, and three anterior stamens dimorphic (Pellegrini 2019). The inflorescence of *Commelina* lacks a developed main axis and cincinnus bracts, with bracteoles that are generally hyaline and so minute that they are virtually invisible to the naked eye (Pellegrini 2019). Furthermore, their inflorescences are always leaf-opposed, even when they seem terminal (Pellegrini 2019).

Despite being an easily recognised genus, species delimitation represents a recurring issue in *Commelina* due to its large number of species (Pellegrini 2019), ephemeral flowers with deliquescent petals, and the massive number of published names of uncertain status (Faden 1985). Furthermore, worldwide, most species of *Commelina* are traditionally regarded as weeds (Holm *et al.* 1977; Wilson 1981), with identification efforts limited to flower colour morphotyping and the doubtful application of names (e.g., Hassemer 2017a, 2017b, 2018a, 2018b, 2019, 2020). *Commelina* also poses a particular taxonomic challenge because its delicate flowers are difficult to observe in dried specimens (Faden 1993, 2008, 2012). Aside from floral characters, inflorescence position and morphology, shape and connation of the spathe (Faden 1993, 2008, 2012), fruit morphology, and seed ornamentation (Nampy *et al.* 2013) play a crucial role in the taxonomy of *Commelina* (Pellegrini & Forzza 2017). Growth form and underground system morphology are also interesting for the taxonomy of the genus (Faden 2012) due to their significant interspecific variation, combined with intraspecific stability (Pellegrini & Forzza 2017). Nonetheless, most taxonomically relevant characters are difficult to almost impossible to observe properly in herbarium specimens. Thus, thorough descriptions, fieldwork, photographs, spirit collections, and cultivation of specimens are essential to forwarding the taxonomy of *Commelina* (Pellegrini & Forzza 2017).

One of the most particularly challenging groups of Neotropical *Commelina* is the one with gem-fruited species, previously treated under the genera *Athyrocarpus* Schltdl., *Commelinopsis* Pichon, and *Phaeosphaerion* Hassk. (Faden & Hunt 1987). The species in this group have a complicated taxonomic and nomenclatural history, with several species being confused with what has also been called the *C. obliqua* complex (Pellegrini & Forzza 2017). As part of an ongoing effort focusing on the taxonomy and systematics of *Commelina*, we: 1) describe a new gem-fruited species from Ecuador and a new tan-coloured-fruited species from central Brazil; 2) address the taxonomic confusion involving the names *C. efoveolata* (C.B.Clarke) L.M.Campb., *C. obliqua* Vahl, *C. pseudomonosperma* (Kuntze) L.M.Campb., *C. rufipes* Seub., *C. robusta* Kunth, *C. scabrata* Seub., and *C. vestita* Seub.; and 3) increase the current knowledge on the identity and application of *C. pallida* Humb. & Bonpl. ex Willd. and *C. texcocana* Matuda. Finally, we present an identification key for all the gem-fruited species of *Commelina* and allies in the Neotropics.

Material and methods

The description and phenology were based on herbaria, spirit and fresh material, field data, and literature. Specimens from the following herbaria were also analysed: AAU, ALCB, ASU, BHCB, B, BBS, BM, BOTU, BR, BRIT, C, CAS, CAY, CEPEC, CESJ, CIIDIR, CGMS, CLF, CM, COL, CR, CTES, CVRD, E, ESA, F, FCAB, FCQ, FLOR, FMB, FURB, G, GH, GUAY, HA, HAMAB, HAS, HB, HBG, HBR, HEM, HERBAM, HNMN, HUEFS, HULE, HUPG, HURB, IAC, IAN, IBUG, ICN, IEB, INB, INPA, J, JAR, JBSD, K, L, LD, LOJA, LPB, M, MA, MAPR, MBM, MBML, MEXU, MG, MICH, MO, MPUC, NHA, NO, NX, NY, P, PH, PMSP, PORT, Q, QAP, QCA, QCNE, QMEX, R, RB (incl. GUA), RFA, S, SCP, SI, SP, SPF, TANG, TEFH, U, UAMIZ, UB, UEC, UJAT, UMSA, UPCB, UPR, UPRRP, US, USZ, VEN, VIES, and VT (herbaria acronyms according to Thiers, continuously updated). Expeditions were carried out by at least one of the authors across Brazil (2008–2025), Colombia (2010–2011), Costa Rica (2008), Ecuador (1994–2022), and the United States (2006, 2016–2017).

The indumentum and shapes terminology follows Radford *et al.* (1974); the inflorescence terminology and morphology follow Weberling (1965, 1989) and Panigo *et al.* (2011); the fruit terminology follows Spjut (1994) and Joseph & Nampy (2012); and seed terminology follows Faden (1991) and Joseph & Nampy (2012). The species' distribution is based on herbarium material, field data, literature, and data extracted from iNaturalist.org (2025), Flickr.com (2025), and GBIF.org (2025). In order to support the distribution data for the accepted species, we provide a selected specimen list, with one voucher per country in which they occur, with further voucher specimens being provided for narrowly distributed species. The distribution maps were prepared using ArcGIS (ESRI 2010) and display ecoregions following the classification of Olson *et al.* (2001). The conservation statuses were proposed following the IUCN Red List Categories and Criteria, ver. 3.1 (IUCN 2012) and the recommendations of the IUCN Standards and Petitions Committee (2024). GeoCAT (Bachman *et al.* 2011) was used to calculate the Extent of Occurrence (EOO) and the Area of Occurrence (AOO).

Results

Class Equisetopsida Brongn.
Order Commelinales Mirb. ex Bercht. & J.Presl
Family Commelinaceae Mirb.
Subfamily Commelinoideae Eaton
Tribe Commelineae Dumort.

Genus ***Commelina*** Plum. ex L.

The gem-fruited *Commelina*

Athyrocarpus Schltdl. (Schlechtendal 1855: 454); Hasskarl (1866: 212); Bentham in Bentham & Hooker (1883: 847). – **Type species:** *Commelina pallida* Humb. & Bonpl. ex Willd.; **designated here**.
Commelinopsis Pichon (Pichon 1946: 227), pro parte. – **Type species:** *Commelina persicariifolia* Redouté.
Phaeosphaerion Hassk. (Hasskarl 1866: 212). – **Type species:** *Commelina leiocarpa* Benth.

Characterisation and circumscription

This informal and non-monophyletic group is treated as such due to the historical taxonomic and nomenclatural confusion involving its species. The only character uniting these eight species is their showy and gem-like fruits, used in the past to delimit genera previously segregated from *Commelina* (i.e., *Athyrocarpus*, *Commelinopsis*, and *Phaeosphaerion*) and tribe Pollieae C.B.Clarke (Clarke 1881). Despite the morphological dissimilarity between these species, they continue to be confused and lumped together by field and generalist botanists, as well as by ecologists, parataxonomists, and amateurs. Thus,

treating them in the same study not only makes sense from a nomenclatural and taxonomic perspective but also centralises the most up-to-date information available for this group.

The fruits in the gem-fruited *Commelina* can range from dehiscent to partially dehiscent to indehiscent, crustaceous or not, and be shiny pearly-white to silvery, opaque off-white, opaque reddish-brown to dark maroon, or glaucous atro-vinaceous to bluish-black to black. The seeds can be monomorphic or dimorphic, free or variously fused to the fruit wall or septa, and their ornamentation can range from smooth to variously ornate. However, as hypothesised by Faden & Hunt (1987), the gem-like fruits seem to have evolved independently several times within *Commelina* since all gem-fruited species are morphologically and phylogenetically related to other species that lack such fruits (Pellegrini *et al.* in prep.). Furthermore, gem-fruited species of *Commelina* are recovered in at least three distantly related lineages in the genus (Pellegrini *et al.* in prep.).

Accepted species

We currently accept eight species of gem-fruited *Commelina*, plus six morphologically similar or closely related species, totalling 14 species. These species are organised into three morphologically cohesive and molecularly supported species groups (Pellegrini *et al.* in prep.), namely: 1) *Commelina benghalensis* group [i.e., *C. obliqua* Vahl, *C. pseudomonosperma* (Kuntze) L.M.Campb., and *C. rufipes* Seub.]; 2) *C. robusta* group [i.e., *C. bambusifolia* Matuda, *C. huntii* M.Pell., *C. robusta* Kunth, *C. scabrata* Seub., *C. sugariae* M.Pell. sp. nov., and *C. vestita* Seub.]; and 3) *C. tuberosa* group [i.e., *C. almandina* M.Pell. & Cornejo sp. nov., *C. efoveolata* (C.B.Clarke) L.M.Campb., *C. leiocarpa* Benth., *C. pallida* Humb. & Bonpl. ex Willd., and *C. texcocana* Matuda].

Distribution

This non-monophyletic group is currently restricted to the Neotropics, although at least one undescribed species is from the Palaeotropics (i.e., Madagascar; Faden & Hunt 1987). In the Neotropics, the group occurs from Mexico, reaching the Antilles and extending all the way down to northern Argentina, Bolivia, and Brazil. Brazil and Mexico are the most species-rich countries for members of this group, with 8 and 7 species, respectively.

Ecology

Most species in this group grow in the understory of dry or rainforests, with a few of them also occurring or being restricted to open environments.

Fruit dispersal

Fruit and seed dispersal in the gem-fruited species has never been studied, and this reflects the complete absence of dispersal studies for Commelinaceae (Pellegrini & Faden 2017). However, it is hypothesised that the species with indehiscent fruits are zoochoric and potentially dispersed by birds (Faden & Hunt 1987; Pellegrini & Faden 2017). However, the species with dehiscent fruits (e.g., the newly described *C. almandina* M.Pell. & Cornejo sp. nov.) seem less likely to be dispersed by birds, despite being dark-coloured, clearly exposed by the plant's vining habit, and being exerted from the spathe during maturity (Pellegrini, pers. obs.). Species with white fruits (dehiscent or not) are small-sized, prostrate to ascending, sometimes scrambling, small understory herbs, making their fruits somewhat difficult for most open environment birds to access. This makes it more likely for the dispersers to be some type of understory bird(s) native to the Neotropical rainforests (Pellegrini, pers. obs.).

Nomenclatural remarks

Athyrocarpus was first described by Schlechtendal (1855: 454), who provides a rather detailed diagnosis for his new genus, characterising it by its sub-solitary inflorescences, with the superior cincinnus aborted

or completely lacking and the lateral one 2–4-flowered, flowers similar to *Commelina* in possessing 5 stamens (2 of which are ended by antherodes, i.e., staminodial), indehiscent green fruits becoming lead-blue at maturity, and dimorphic seeds. Schlechtendal (1855) goes into further detail, comparing his new genus to *Aclisia* E.Mey. ex C.Presl, *Pollia* Thunb., and *Lamprocarpus* Blume (all currently treated as *Pollia* s. lat.) due to their similar fruit morphology. Therefore, Schlechtendal's (1855: 454) is considered the original work where this name was first validly published. Thus, Hasskarl (1866: 212) and Bentham & Hooker (1883: 847) actually represent citations of Schlechtendal's genus and not attempts to validate the name as considered by many databases. Finally, Schlechtendal (1855: 454) included two species in his new genus, *C. pallida* and C. *rubens* Redouté; however, without formally transferring any of them to *Athyrocarpus*. Based on Schlechtendal's diagnosis, plus the fact that *C. rubens* is considered to be distantly related to *C. pallida* (this study; see Remarks under *C. rubens* and Discussion), we designate *C. pallida* as the type species for *Athyrocarpus*. Interestingly, neither *C. pallida* nor C. *rubens* present the gem-like blue fruits deemed to be diagnostic for the genus.

When describing *Commelinopsis*, Pichon (1946) unambiguously designated *Commelina persicariifolia* Redouté as the type species for his new genus by including it as its sole species. Nonetheless, the species does not possess the crustaceous, indehiscent and pearly-white to silvery capsules and seeds fused to the fruit wall and septae, which were listed by the author as diagnostic for the genus (Pichon 1946: 227). This is easily explained by Pichon's incorrect application of *C. persicariifolia*, which for Pichon was conspecific with *C. rufipes*. Therefore, despite the widespread use of this generic name for the *C. rufipes* complex, it is actually typified by an unrelated species belonging to the *C. tuberosa* group.

Phaeosphaerion was described by Hasskarl (1866: 212) based on his identification key for the genera of Commelinaceae. Despite being brief, the step leading to *Phaeosphaerion* characterises the genus as having flowers obscured by the spathe, simple stigma, and indehiscent, shiny and lead-black capsules. Despite not formally transferring it to his new genus, Hasskarl (1866: 212) does cite *C. leiocarpa* Benth. Hence, this species must be treated as the type species for the genus *Phaeosphaerion*.

Key to the gem-fruited *Commelina* Plum. ex L. and allies

1. Leaf-sheaths with hyaline to white hairs along the margin; inflorescences predominantly axillary and leaf-opposed, long pedunculate (peduncle the same length or longer than ½ length of the spathe), spathe base free, internally inconspicuously mucilaginous; sepals opaque, green, lower sepals sessile, free, medial petal shortly-clawed, style base tapering into the ovary; fruits thick-walled .... 2 (*Commelina tuberosa* group)
– Leaf-sheaths with light brown to brown or rusty to rusty-brown or red to dark red to atro-vinaceous hairs along the margin; inflorescences terminal or apparently so, short-pedunculate to sessile (peduncle shorter than ½ length of the spathe), spathe base connate at least at base, internally conspicuously mucilaginous; sepals hyaline, colourless to white, lower sepals shortly-clawed, connate up to half their length, medial petal sessile, style base not tapering into the ovary; fruits thin-walled 6

2. Peduncle pendulous, spathe slightly falcate, base cordate; pedicels puberulous with minute hook-hairs only, style twice as long as the stamens, persistent in fruit, stigma tan-coloured; fruits indehiscent, glaucous, not constricted between the seeds when mature, atro-vinaceous to bluish-black to black when mature, apex round to apiculate; seeds monomorphic, triangular to widely triangular to triangular-ellipsoid 3
– Peduncle straight, spathe straight, base subcordate to round; pedicels pilose with acicular hairs or with a mixture of acicular and hook-hairs, style slightly longer than the stamens, deciduous in fruit, stigma white; fruits dehiscent, 3-valved, opaque, constricted between the seeds when mature, tan-coloured or reddish-brown to dark maroon when mature, apex rostrate; seeds dimorphic, ellipsoid 4

3. Stems branched from the base or almost so, sparsely to densely hispid with acicular hairs; leaf-blades adaxially sparsely to densely hispid with acicular hairs, abaxially sparsely to densely hispid with acicular hairs, hairs generally congested along the midvein, margin ciliate with a mixture of prickle- and acicular hairs; spathe externally sparsely to densely hispid with acicular hairs; dorsal sepal pilose along the midvein, lower sepals widely elliptic, petals white to pale lilac-blue to light blue, medial petal apex obtuse to round, antherodes yellow, X-shaped, upper lobes conspicuous, lower lobes spathulate to obovate, medial anther linear-hastate; seeds slightly cleft towards the embryotega, ventrally flattened, dark grey to black, testa rugose, farinae white ..... ***Commelina efoveolata*** (C.B.Clarke) L.M.Campb.
– Stems branched in the upper half or upper third, scabrid with a mixture of prickle- and hook-hairs; leaf-blades adaxially glabrous to scabrid with a mixture of prickle- and hook-hairs, sometimes also sparsely setose along the midvein, abaxially scabrid with a mixture of prickle- and hook-hairs and setose along the midvein, margin papillose; spathe externally glabrous to scabrid with a mixture of prickle- and hook-hairs; sepals glabrous, lower sepals ovate to widely ovate, petals sky blue, medial petal apex cuspidate, antherodes white, V-shaped, upper lobes absent, lower lobes filiform, medial anther narrowly sagittate; seeds not slightly cleft towards the embryotega, ventrally pyramidal, light grey to greyish-brown, testa foveolate, farinae cream-coloured ..... ***Commelina leiocarpa*** Benth.

4. Vining herbs; synflorescence generally composed of a main florescence plus 1–2 co-florescences; all sepals evenly pilose, paired petals limb base subcordate, antherodes with upper lobes conspicuous, lower lobes spathulate to obovate, anthers white to cream-coloured, lateral anthers held near the antherodes and medial anther, stigma truncate; fruits with valves splitting only up to mid-length, reddish-brown to dark maroon when mature ..... ***Commelina almandina*** M.Pell. & Cornejo sp. nov.
– Scrambling herbs; synflorescence composed of a solitary main florescence; all sepals glabrous to dorsal sepal pilose along the midvein, paired petals limb base truncate, antherodes with upper lobes absent or reduced, lower lobes filiform, anthers yellow, lateral anthers held near the medial, stigma capitate; fruits with valves splitting to base, tan-coloured when mature 5

5. Stems, leaf-sheaths, leaf-blades and spathe sparsely strigose to strigose, hairs drying light brown to golden; leaf-blade base obtuse to round; spathe with apex acute, straight; pedicel pilose with a mixture of acicular and hook-hairs, dorsal sepal ovate, glabrous to slightly puberulous along the midvein, lower sepals ovate, slightly overlapping, petals pale lilac to lilac, antherodes V-shaped, medial anther linear sagittate to narrowly sagittate, strongly curved, ovary verrucose; capsules widely ellipsoid to oblongoid, sessile ..... ***Commelina pallida*** Humb. & Bonpl. ex Willd.
– Stems, leaf-sheaths and leaf-blades glabrous, spathe glabrous to velutine, when present hairs hyaline; leaf-blade base cuneate; spathe with apex acuminate, slightly falcate; pedicel pilose with acicular hairs only, dorsal sepal elliptic to narrowly triangular, setose along the midvein, lower sepals triangular to widely trullate, divergent, petals white to light blue, antherodes scarcely X-shaped, medial anther oblong-sagittate, curved, ovary smooth; capsules fusiform to ellipsoid, short-stipitate ..... ***Commelina texcocana*** Matuda

6. Leaf-blade margin slightly revolute; spathe only basally connate, much lighter than the leaves (in vivo), the fused base splitting open in fruit; pedicels sparsely puberulous to puberulous with minute hook-hairs, sepals early deciduous in fruit, medial petal opaque, antherodes narrowly hastate to subtrapezoid, stigma truncate; fruits short-stipitate, indehiscent, not constricted between the seeds, crustaceous, pearly-white to silvery when mature; seeds ventrally pyramidal, all adnate to the fruit wall and septa and forming a dispersal unit, testa smooth, non-farinose; seeds embryotega lateral, ventral seeds hilum linear ..... 7 (*Commelina benghalensis* group)
– Leaf-blade margin flat; spathe base connate on the basal half to almost completely connate, the same colour as the leaves (in vivo), base remaining fused in fruit; pedicels glabrous, sepals persistent and accrescent in fruit, medial petal hyaline, antherodes X-shaped, stigma trilobate; fruits sessile,

dehiscent, constricted between the seeds, not crustaceous, tan-coloured or off-white when mature; seeds ventrally flattened, not adnate to the fruit wall and septa and each dispersed individually, testa ornate, at least ventral locule seeds farinose; seeds embryotega semidorsal to semilateral, ventral seeds hilum curved or C-shaped ..... 9 (*Commelina robusta* group)

7. Stems prostrate; leaf-sheaths hirsute throughout, margin hirsute, hairs rusty to rusty-brown, blades lanceolate to elliptic-lanceolate, opaque, membranous, hispid on both sides, hairs hyaline, sparsely hirsute along the midvein and near base, hairs rusty to rusty-brown, base symmetric, cuneate to obtuse, apex acute; spathe ovate to widely ovate, hispid with hyaline acicular hairs, sometimes with some rusty hirsute hairs; paired petals limb rhombic to rotund, medial petal elliptic to narrowly oblanceolate, flat; antherodes apiculate between the upper lobes, upper lobes absent; medial connective oblong; seed testa smooth ..... ***Commelina rufipes*** Seub.
– Stems ascending to scrambling; leaf-sheaths glabrous, margin glabrous to setose, hairs light brown to rusty, blades lanceolate to ovate, sometimes elliptic, lustrous, thinly chartaceous to chartaceous, glabrous on both sides or adaxially glabrous to scabrid with prickle-hairs and abaxially, base asymmetric to strongly asymmetric, one side cuneate the other round, apex acuminate to long-acuminate; spathe very widely ovate to depressed ovate, glabrous, rarely with occasional hook-hairs; paired petals limb widely rhombic-reniform to reniform, medial petal lanceolate or spathulate to oblanceolate, not flat; antherodes not apiculate between the upper lobes, upper lobes present; medial connective saddle-shaped; seed testa inconspicuously foveolate 8

8. Synflorescences composed of a solitary main florescence, terminal; spathe margin flat, apex acuminate; petals white, medial petal lanceolate, flat, margin revolute at mid-length, forming a medial constriction, apex acute; antherodes narrowly hastate, distinctly lobed, minute pollen sacs between the upper and lower lobes present, obliquely connate to the lower lobes, lateral anthers elliptic to ovate, held near the antherodes, medial anther held near the medial petal, style sigmoid, apex strongly recurved; fruits 6–9 per spathe, widely ellipsoid to widely oblongoid, stipe 0.3–0.9 mm long ..... ***Commelina obliqua*** Vahl
– Synflorescences composed of main florescence plus 1–6 co-florescences, axillary and terminal; spathe margin repandous, apex acute; petals pale lavender to light pink, medial petal spathulate to oblanceolate, cucullate, margin flat, lacking a medial constriction, apex round; antherodes subtrapezoid, indistinctly lobed, minute pollen sacs between the upper and lower lobes absent, lateral anthers subcordate to cordate, held near the medial anther and stigma, style straight to very gently sigmoid, apex not recurved; fruits 2–4 per spathe, widely obovoid, stipe 0.8–1.2 mm long ..... ***Commelina pseudomonosperma*** (Kuntze) L.M.Campb.

9. Leaf-sheaths hirsute, blades narrowly oblong to narrowly elliptic, obliquely asymmetric, adaxially glabrous to hispid, abaxially hirsute along the midvein, apex acuminate to long-acuminate; spathe connate to the apex or almost so, marcescent in fruit, upper cincinnus vestigial, flowerless, peduncle included in the spathe, lower cincinnus glabrous to sparsely puberulous with minute hook-hairs only towards the apex; lower sepals connate up to mid-length, paired petals limb base cuneate, medial petal lanceolate to ovate, medial anther lacking a vinaceous to dark purple spot on the connective; capsules off-white and opaque when mature, all locules 1-seeded; ventral seeds hilum C-shaped 10
– Leaf-sheaths scabrid, blades lanceolate to ovate, straight, scabrid or velutine on both sides, apex obtuse to acute; spathe connate up to mid-length, remaining green in fruit, upper cincinnus developed, flowered, peduncle exserted from the spathe, lower cincinnus pilose with hook-hairs or with a mixture of acicular and hook-hairs; lower sepals connate up to the upper third, paired petals limb base cordate, medial petal spathulate to obovate, medial anther with an orange-brown or vinaceous to atro-vinaceous spot on the connective; capsules tan-coloured and shiny when mature, dorsal locule 1-seeded, ventral ones 2-seeded; ventral seeds hilum curved 11

10. Leaf-blades sessile, adaxially hispid with a mixture of acicular and glandular hairs, abaxially hispid, hirsute along the midvein, hairs acicular, base amplexicaulous to subamplexicaulous; paired petals light blue to pale lilac; fruits subglobose, smooth, apex round to 3-lobed, not parasitised, equally 3-valved, valves splitting to base; seeds monomorphic, all free from the fruit wall, testa smooth to inconspicuously foveolate ..... ***Commelina bambusifolia*** Matuda
– Leaf-blades pseudopetiolate, adaxially glabrous to hispid, hairs acicular, abaxially hispid, hirsute along the midvein, hairs acicular, base cuneate; paired petals sky blue; fruits prismatic, sparsely verrucose, apex aristate, consistently parasitised by weevil larvae, unequally 2-valved, valves splitting up to mid-length; seeds dimorphic, dorsal locule seed adnate to the fruit wall, testa shallowly foveolate, ventral locule seeds free from the fruit wall, testa sparsely echinate ..... ***Commelina scabrata*** Seub.

11. Leaf-sheath margin densely hispid to setose with rusty to rusty-brown hairs; paired petals white, medial petal concave, 2-auriculate, concolourous with the paired petals, lateral anthers with margin tinted purple to atro-purpureous; ovary and capsules with black papillae, capsules 1–2 per spathe; seeds apricot-farinose, dorsal seed testa shallowly foveolate ..... ***Commelina huntii*** M.Pell.
– Leaf-sheath margin with light brown to brown or red to dark red to atro-vinaceous hairs; paired petals light blue to blue to sky blue or pale lilac to lilac, medial petal involute, entire, discolourous with the paired petals, lateral anthers evenly coloured; ovary and capsules smooth, capsules 3–9 per spathe; seeds white-farinose, when present dorsal seed testa rugose-foveolate 12

12. Herbs delicate; stems ascending to erect throughout, unbranched or branched only at base, not glaucous; leaf-sheath margin with light brown to brown hairs, blades abaxially light green speckled with vinaceous to dark purple to completely vinaceous to dark purple; spathe cordate to widely cordate, rarely depressed ovate; lower sepals limb obovate to widely obovate, depressed oblique-ovate, paired petals claw blue to sky blue, medial petal white, apex slightly involute, filaments apex tan-coloured, antherodes apiculate between the upper lobes, anthers pale orange-yellow to pale apricot, lateral anthers held near the stigma, medial anther held near the antherodes; capsules 6–9 per spathe ..... ***Commelina vestita*** Seub.
– Herbs medium-sized to robust; stems base prostrate, apex ascending to scrambling, branched throughout or branched on the upper third, glaucous; leaf-sheath margin with rusty to rusty-brown to red to dark red to atro-vinaceous hairs, blades abaxially evenly light green to greyish-green; spathe widely ovate to very widely ovate or depressed ovate to widely depressed ovate; lower sepals limb widely oblique-ovate, paired petals claw mauve to lilac, rarely white, medial petal light blue to pale lilac, apex completely involute, filament apex burgundy to atro-vinaceous, antherodes not apiculate between the upper lobes, anthers orange-yellow to orange to apricot, lateral anthers held near the medial anther; capsules 3–5 per spathe 13

13. Stems glabrous to scabrid with prickle-hairs; leaf-blades abaxially scabrid with prickle-hairs, abaxially scabrid with prickle-hairs to pilose with acicular hairs, hairs hyaline; spathe depressed ovate to widely depressed ovate, rarely very widely ovate, externally scabrid with prickle-hairs, apex obtuse to round, bracteoles very widely ovate to depressed ovate; dorsal sepal triangular to widely triangular, paired petals limb very widely ovate-reniform to depressed ovate-reniform, medial petal spathulate to obovate, abaxially puberulous at base with glandular microhairs, antherodes with upper lobes equal to subequal to lower ones, ovary 3-carpellate, ellipsoid; capsules obovoid, not dorsiventrally compressed, 3-locular, unequally 2-valved, 5-seeded ..... ***Commelina robusta*** Kunth
– Stems puberulous with glandular microhairs; leaf-blades abaxially hispidulous to densely hispidulous with acicular hairs or a mixture of prickle- and acicular hairs, hispid along the midvein with acicular hairs, hairs hyaline, sometimes rusty at blade base; spathe widely ovate to very widely ovate, externally sparsely pilose to pilose with minute hook-hairs or with a mixture of hook- and glandular microhairs,

sometimes with sparse to occasional hispid setose hairs, apex obtuse to acute, bracteoles ovate; dorsal sepal elliptic to ovate, paired petals limb ovate-reniform to widely ovate-reniform, medial petal oblanceolate, glabrous on both sides, antherodes with upper lobes conspicuously shorter than lower ones, ovary 2-carpellate, oblong; capsules oblong to rectangular, dorsiventrally compressed, 2-locular, equally 2-valved, 4-seeded ..... ***Commelina sugariae*** M.Pell. sp. nov.

Commelina almandina M.Pell. & Cornejo sp. nov.
urn:lsid:ipni.org:names:77347326-1
Figs 1–2; Table 1

Diagnosis

Similar to *C. efoveolata*, *C. leiocarpa*, *C. pallida*, and *C. texcocana* due to their leaf-sheaths with hyaline to white hairs along the margin, inflorescences predominantly axillary and leaf-opposed, with a long peduncle, spathe base free, pedicels pilose, sepals opaque, green, lower sepals sessile and free, paired petals limb apex obtuse, and medial petal conspicuous and shortly-clawed. However, *C. almandina* sp. nov. can be easily differentiated from all species in the genus due to a combination of evenly pilose pedicels and sepals, white to cream-coloured anthers, aborted medial staminode, stigma truncate and white, fruits widely ellipsoid, thick-walled, dehiscent, 3-valved, valves splitting only up to mid-length, opaque reddish-brown to dark maroon when mature, and seeds densely farinose. The fruits of *C. almandina* are unique in the genus.

Etymology

The epithet derives from the French word 'almandine', a corruption of the Medieval Latin words '*alamandīna*' and '*alabandīna*', which were the names given to the deep to dark red types of garnets. This name is chosen in reference to the new species' reddish-brown to dark maroon and gem-like fruits. The epithet also refers to the character Garnet from the Cartoon Network series 'Steven Universe', created by Rebecca Sugar. Garnet is a member of a gem-based alien species and the current leader of the Crystal Gems. In the cartoon, Garnet fights for the right to be who they are. The existence of Garnet is deemed an abomination by some members of their species since they are formed by the fusion of two independent Gems of different types, Ruby and Sapphire. Thus, Garnet is the personification of the love shared between Ruby and Sapphire, representing a metaphor for a BIPOC LGBTQIA+ relationship. Academia has been historically dominated by white, cisgender, straight male scientists from the Global North. The past decades have given rise to countless movements to diversify and decolonise science. Honouring this fictional character is fitting not only due to the species' unique and gorgeous gem-like fruits but also because it brings much-needed attention to BIPOC and LGBTQIA+ researchers in STEM.

Type material

Type

ECUADOR – **Guayas** • Guayaquil, Cerro Azul; 18 Jul. 2020; fl; *X. Cornejo & J. Josse 9333*; holotype: GUAY [GUAY no. 13583]!.

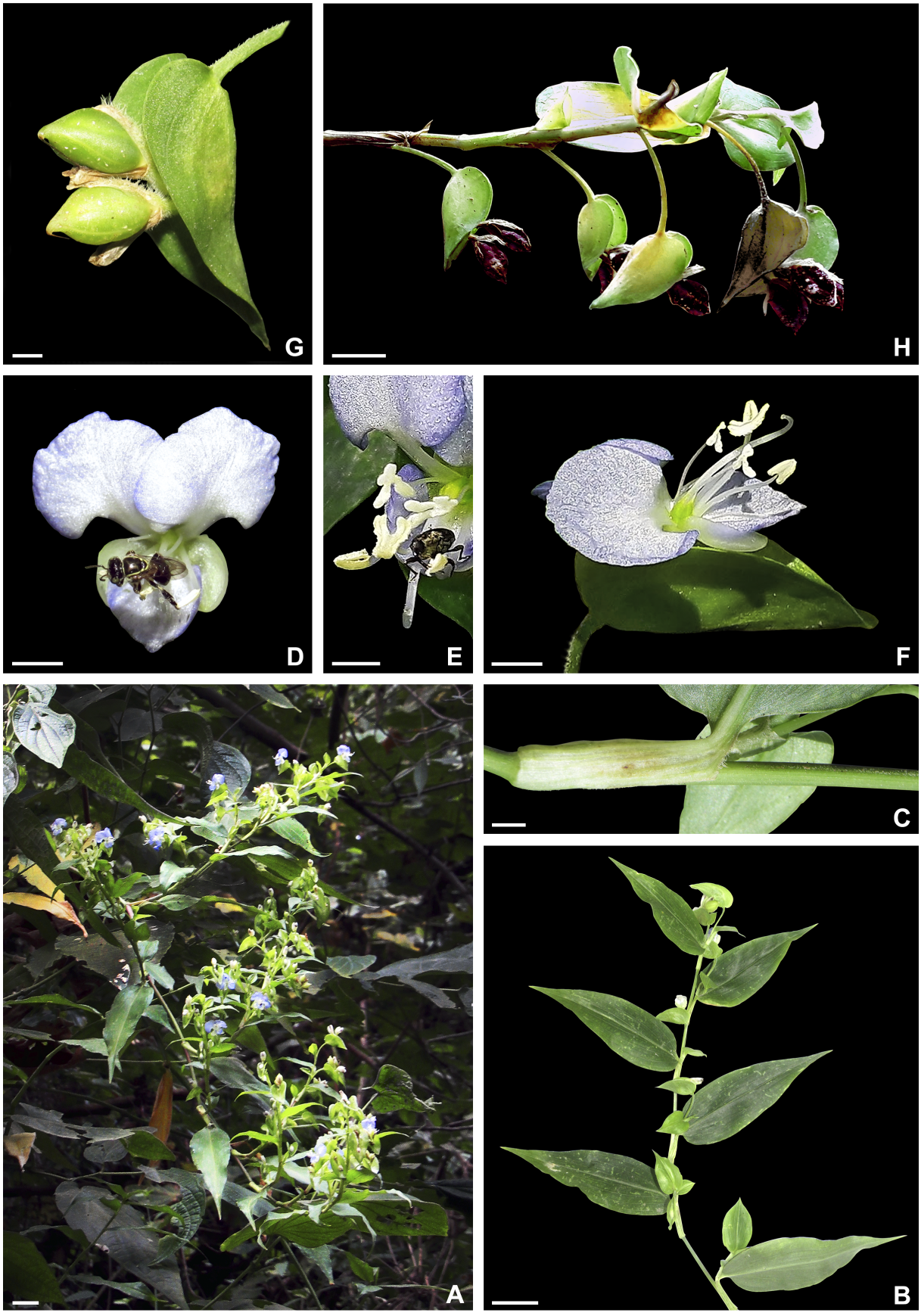
Paratypes

ECUADOR – **Guayas** • vicinity of Guayaquil, Cerro Azul; 13 Jun. 1955; fl., fr.; *E. Asplund 16628*; S! • vicinity of Guayaquil, Cerro Azul; 14 Jun. 1955; fl., fr.; *E. Asplund 16645*; S! • Hacienda Barcelona, 12 km W of Guayaquil, on the road to Playas-Salinas; 24 Jul. 1962; fl., fr.; *A.J. Gilmartin 762*; US! • vicinity of Guayaquil, Cerro Azul; 2°08′ S, 79°59′ W; 450 m a.s.l.; 26 Jun. 1994; fl.; *X. Cornejo & C. Bonifaz 2931*; GUAY!.

Description

Herbs 40–300 cm tall, vining, perennial, robust, terrestrial. *Roots* tuberous, cylindric, with apical fusiform tubers. *Rhizome* short. *Stems* dimorphic, fibrous, branched in the upper third, primary branches ascending, rooting only at the base, secondary branches shorter than the primary branches, twining, apex decumbent or suberect to ascending; internodes 2.2–11.1 cm long, distally shorter, green, glabrous, with a sparse line of acicular hairs opposite to the leaves, hairs hyaline. *Leaves* distichously-alternate, evenly distributed along the upper part of the stem, pseudopetiolate; sheaths 1.1–2.3 cm long, light green, glabrous, with a sparse line of acicular hairs opposite to the blade, hairs hyaline, margin upright, sparsely ciliate to ciliate, hairs acicular, hyaline; pseudopetiole 2.2–4.6 mm long; blades 2.9–9.7 × (1–)1.5–2.7 cm, lanceolate to ovate, straight, membranous to thinly chartaceous, adaxially dark green, abaxially light green, drying adaxially dark green or olive-green, abaxially light green or olive-green, glabrous on both sides, base asymmetric, obtuse to round, margin flat, scabrid with prickle-hairs, apex acuminate to long-acuminate; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins 2–3 pairs, adaxially conspicuous, abaxially inconspicuous, becoming conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence or a main florescence and 1–2 co-florescences, restricted to the apex of the stems and forming a dense second-degree synflorescence. *Inflorescences* leaf-opposed, peduncle 2.3–4.1 cm long, straight, glabrous, except for a line of minute hook-hairs opposed to the spathe, sometimes with some odd eglandular hairs, hairs hyaline; spathe 1.2–2.5 × 1–2.2 cm, cordate, patent to the peduncle, concolourous with the leaves, internally inconspicuously mucilaginous, base free, subcordate to round, glabrous on both sides, margin flat, minutely scabrid with prickle-hairs, hairs hyaline, apex acute, straight, veins 4–5 pairs, inconspicuous, becoming conspicuous when dry; upper cincinnus vestigial, flowerless, rarely producing a single abortive, staminate flower, peduncle 0.8–1.1 mm long, included, gently recurved at pre-anthesis and anthesis, recurved and exserted at post-anthesis and fruit, glabrous with some odd hook-hairs towards the apex, hairs hyaline; lower cincinnus 2–4-flowered, flowers mainly bisexual, rarely staminate, peduncle 6.7–16 mm long, thickened in fruit, sparsely puberulous with minute hook-hairs towards the apex, hairs hyaline; bracteoles early deciduous, cup-shaped, inconspicuous, light green, opaque, margin entire, glabrous. *Flowers* chasmogamous, zygomorphic, enantiostylous (style dislocated to the opposite side to the medial stamen); floral buds 2.2–3.8 × 2–2.5 mm, obovoid, light green or pale lilac to light blue, pilose, hairs hyaline; pedicel 1.7–2.4 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, pilose, hairs acicular, hyaline; sepals light green, opaque, persistent and accrescent in fruit, dorsal sepal 2.9–3.4 × 1.9–2.3 mm, elliptic to narrowly triangular, concave, pilose, densely pilose at base, hairs hyaline, apex acute, lower sepals 3.2–3.6 × 2.1–2.4 mm, sessile, free, ovate to widely ovate, concave, sparsely pilose, pilose at base, generally glabrescent in fruit, hairs hyaline, apex obtuse; paired petals 3.2–4 × 3.1–3.6 mm, clawed, claw 0.6–0.8 mm long, white to pale lilac to light blue, limb 2.7–2.9 × 3.1–3.6 mm, widely reniform to widely rhombic-reniform, pale lilac to lilac to light blue, base asymmetric, subcordate, apex obtuse to slightly emarginate, medial petal 3.3–3.8 × 3.2–3.8 mm, shortly-clawed, claw 0.2–0.3 mm long, white, limb 3.1–3.5 × 3.2–3.8 mm, widely sagittate, entire, concave, concolourous with the paired petals, opaque, glabrous on both sides, apex obtuse; staminodes 2, medial staminode completely absent, filaments 1.7–2.5 mm long, straight to arcuate-decurved, white, base light green, apex pale lilac to light blue, antherodes 1–1.2 × 0.3–0.4 mm, X-shaped, white, minute pollen sacs between the upper and lower lobes present, non-polliniferous or producing very

Fig. 1 (next page). *Commelina almandina* M.Pell. & Cornejo sp. nov., holotype (*X. Cornejo & J. Josse 9333*, GUAY). **A**. Vining habit. **B**. Secondary branch. **C**. Detail of the leaf-sheath. **D–F**. Flower. **D**. Bisexual flower being visited by *Plebeia* sp. **E**. Detail of the androecium of a bisexual flower being visited by a weevil. **F**. Side view of a bisexual flower showing anther and antherode position in relation to the stigma. **G–H**. Fruits. **G**. Immature capsules showing the pilose sepals. **H**. Secondary branch with mature capsules showing their dark maroon colour. Photos by X. Cornejo. Scale bars: A = 1.5 cm; B = 2.5 cm; C = 2.5 mm; D–F = 2 mm; G = 1 mm; H = 7.5 mm.


G
H
D
E
F
C
A
B

few grains, not apiculate between the upper lobes, upper lobes conspicuous, spathulate, smaller than the lower, lower lobes spathulate to obovate; lateral filaments 3.4–4.6 mm long, gently sigmoid, geniculate distal to the middle, white, base light green, apex pale lilac to light blue, anthers 1.5–1.8 × 0.6–0.8 mm, held near the antherodes and medial anther, sagittate, white to cream-coloured, drying cream-coloured to pale yellow, connective white, pollen white, drying pale yellow; medial filament 2.8–3.6 mm long, straight to arcuate-recurved, apex recurved, white, base light green, apex pale lilac to light blue, anther 1.9–2.2 × 0.6–0.8 mm, held near the antherodes and lateral anthers, hastate, curved, white to cream-coloured, drying cream-coloured to pale yellow, connective hastate, white, anther sacs appressed to each other, pollen white, drying pale yellow; ovary 0.7–1 × 0.4–0.6 mm, 3-carpellate, 5-ovulate, ellipsoid to widely ellipsoid, green, smooth, glabrous, style 2.7–3.4 mm long, exceeding the stamens, sigmoid, base tapering into the ovary, apex strongly recurved, white, base light green, apex pale lilac to light blue, deciduous in fruit, stigma truncate, white. *Capsules* 1–2 per spathe, 7.4–8.5 × 5–5.4 mm, widely ellipsoid, sessile, fruit wall thick, apex rostrate, not constricted between the seeds when immature, becoming constricted between the seeds when mature, light green when immature, reddish-brown to dark maroon when mature, sometimes irregularly speckled tan, opaque, glabrous, smooth, 3-locular, 3-valved, valves splitting only up to mid-length, dorsal locule 1-seeded, ventral locules 2-seeded. *Seeds* dimorphic, dark brown to black; dorsal locule seed 4.2–4.4 × 2.8–3 mm, free from the capsule wall, ellipsoid, dorsiventrally compressed, ventrally flattened, slightly cleft towards the embryotega, testa shallowly rugose, with some small furrows on the side opposed to the embryotega, completely covered by a thick, cream-coloured farinae, embryotega semilateral, inconspicuous, with a prominent apicule, hilum linear, longer than ½ the length of the seed; ventral locule seeds 2.5–2.8 × 2.5–2.6 mm, free from the capsule wall, widely ellipsoid, truncate at one end, ventrally flattened, not cleft towards the embryotega, testa irregularly rugose, densely farinose, farinae cream-coloured, embryotega semilateral to lateral, inconspicuous, with a prominent apicule, hilum linear, ca ½ the length of the seed.

Distribution

Commelina almandina sp. nov. is currently endemic to Guayaquil, province of Guayas, Ecuador (Fig. 2).

Ecology

It grows in the understory of conserved patches of dry forests between 200–400 m a.s.l. It is persistent in the interior and at the edge of secondary forests, under a more or less closed canopy, but does not grow on fully open disturbed habitats. In the type locality, it is occasionally sympatric at the edge of forests but never in intermixed populations with the distantly related *C. erecta* L.

Phenology

It was found in bloom in June and July and with fruits from June to August. The flowers open during the morning, at 10:00 AM, and small native bees of the genus *Plebeia* Schwarz, 1938 (Apidae, Meliponini) have been observed visiting the flowers and transporting pollen grains to the stigma while feeding on pollen grains from other anthers (Cornejo, pers. obs.). Fruit and seed production seem consistent, and, despite the lack of breeding experiments, the species seems to match a seed set pattern consistent with self-compatibility with post-anthesis self-pollination. This is also consistent with field and cultivation observations for other (closely and distantly) related species of *Commelina* (Faden & Pellegrini, unpubl. data). We have not observed any animals interacting with the fruits despite their striking colouration and being clearly exposed by the pendulous spathes along the secondary branches.

Proposed vernacular names

Churuyuyo granate (Ecuador), Guayaquil's Commelina (English).

Conservation

The surviving patches of the Cerro Azul forests and the adjacent Cerro Blanco forests where *C. almandina* sp. nov. occurs encompass less than 200 km^2, with the species presenting a minuscule EOO of 0.928 km^2 and AOO of 0.143 km^2. The known extant subpopulations are highly fragmented and generally have fewer than five mature individuals. These subpopulations have been greatly affected by selective timber tree cutting during past decades and are under high pressure from the continuing urban development of the

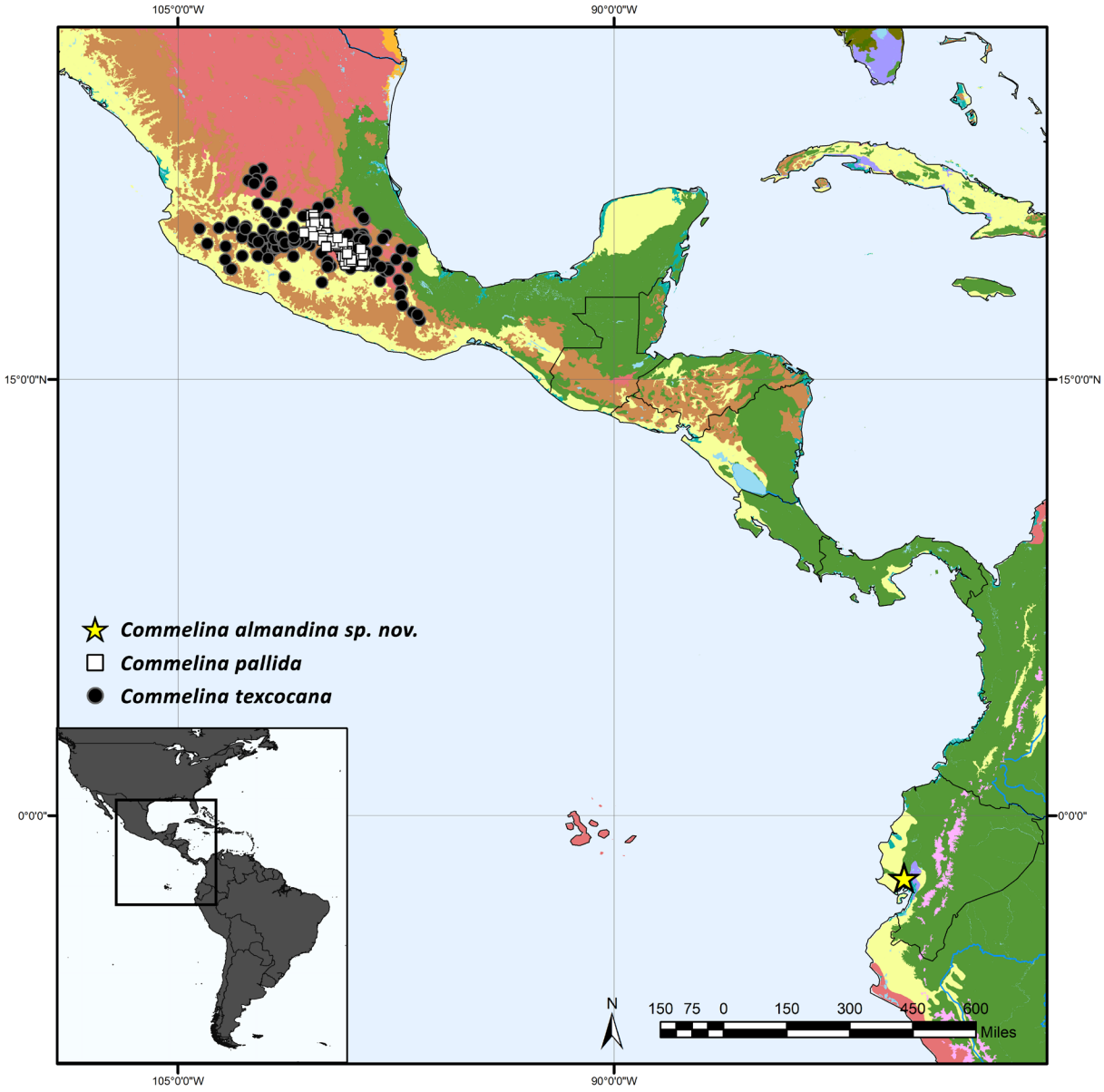


Fig. 2. Distribution map for the *Commelina pallida* complex. Green = Tropical and Subtropical Moist Broadleaf Forests; Pale Yellow = Tropical and Subtropical Dry Broadleaf Forests; Brown = Tropical and Subtropical Coniferous Forests; Army Green = Temperate Coniferous Forest; Orange = Tropical and Subtropical Grasslands, Savannas and Shrublands; Lilac = Flooded Grasslands and Savannas; Pink = Montane Grasslands and Shrublands; Red = Deserts and Xeric Shrublands; Teal = Mangroves and Coastal Environments.

city of Guayaquil. Finally, neither the Cerro Azul forests nor the adjacent Cerro Blanco forests represent protected areas, making them even more susceptible to anthropogenic threats.

The most recent collection of this species (from 2020) was selected by us as the holotype to highlight that despite all ongoing threats, the species is still extant and could be a good potential candidate for both in-situ and ex-situ conservation efforts, especially due to the species being potentially self-compatible. Therefore, the preliminary status of Critically Endangered [CR, B1ab(iii, iv, v)+B2ab(iii, iv, v)+D2] is assigned to this species, following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations.

Remarks

Commelina almandina sp. nov. is unique in the genus due to its partially dehiscent, opaque reddish-brown to dark maroon fruits. It is morphologically most closely related to *C. pallida* and *C. texcocana* (both endemic to Mexico) due to their straight peduncles, spathe straight with a subcordate to round base, pedicels pilose with acicular hairs, sepals green and variously pilose (glabrous only in *C. texcocana*), petals pale-coloured and subequal, white to cream-coloured antherodes, medial staminode aborted, stigma white, capsules dehiscent, opaque, constricted between the seeds when mature, apex rostrate, the dorsal locule 1-seeded and the ventral locules 2-seeded, and seeds dimorphic, ellipsoid and ventrally flattened, and dark brown to black seeds (Table 1). These characters are very peculiar in *Commelina* but certainly not restricted to these species. The opaque sepals are certainly plesiomorphic in the family but also very uncommon in the genus (Pellegrini 2019). Thus, it is likely that these three species are closely related. However, *C. pallida* presents strigose stems, leaf-sheaths and leaf-blades, glabrous sepals, and capsules tan-coloured when mature (Table 1). In *C. texcocana*, only the dorsal sepal is setose along the midvein, the petals range from white to light blue, and the capsules are tan-coloured when mature (Table 1). However, *C. almandina* can be easily differentiated from these species due to its large-sized vining habit, synflorescence generally composed of a main florescence plus 1–2 co-florescences, spathe patent to the peduncle, evenly pilose sepals, paired petal limb base cordate, aborted medial staminode, staminodes with conspicuous upper lobes and spathulate to obovate lower lobes, anthers white to cream-coloured, lateral anthers held near the antherodes and medial anther, stigma truncate, and the aforementioned fruit morphology (Table 1).

It is also similar to *C. efoveolata* and *C. leiocarpa* due to their robust vining habit, tuberous roots, pilose pedicels, and gem-like fruits (Table 1). Nonetheless, *C. almandina* sp. nov. can be easily differentiated from *C. efoveolata* and *C. leiocarpa* due to its pilose sepals (vs dorsal sepal setose along the midvein and laterals glabrous in *C. efoveolata* and all glabrous in *C. leiocarpa*), white to cream-coloured anthers (vs yellow), white stigma (vs tan-coloured and sky-blue?), fruits dehiscent, widely ellipsoid, opaque reddish-brown to dark maroon and apex rostrate (vs indehiscent, globose, glaucous and atro-vinaceous to bluish-black to black), and by its dimorphic seeds (vs monomorphic) (Table 1). Another two gem-fruited species (viz., *C. obliqua* and *C. rufipes*) are recorded for Ecuador and surrounding areas, all with indehiscent and pearly-white to silvery crustaceous fruits (see Remarks below on each species). Nonetheless, these species present well-developed upper cincinnus, white petals, yellow antherodes and anthers, and monomorphic seeds adnate to the capsule wall. Finally, *C. almandina* is also easily differentiated from the sympatric *C. erecta* by its climbing habit (vs prostrate to ascending to erect in *C. erecta*), spathe with free margin (vs connate), petals subequal and lilac to light blue (vs unequal and generally sky blue, rarely lilac or white), white anthers (vs greyish-purple to greyish-blue), capsules smooth (vs dorsal locule verrucose), seeds farinose and lacking a lateral appendage (vs very sparsely farinose and with a lateral, tan-coloured and fleshy appendage), with ornate testa (vs smooth), and by growing in a more preserved habitat with a more or less closed canopy, fresher, and shady understory (vs the adjacent highly disturbed, warmer, and open habitats).

Table 1. Diagnostic field characters for the gem-fruited species of the *Commelina tuberosa* group.

Characters	*Commelina almandina* sp. nov	*Commelina efoveolata*	*Commelina leiocarpa*	*Commelina pallida*	*Commelina texcocana*
Growth form	Vining	Scrambling to scrambling-fruticose with scrambling or twining secondary branches	Scrambling-fruticose to erect-fruticose with scrambling or twining secondary branches	Scrambling	Scrambling
Pedicel	Pilose with acicular hairs	Sparsely puberulous with minute hook-hairs	Sparsely puberulous with minute hook-hairs	Pilose with a mixture of acicular and hook-hairs	Pilose with acicular hairs
Dorsal sepal	Elliptic to narrowly triangular, pilose, densely pilose at base	Elliptic to narrowly triangular, pilose along the midvein	Elliptic to narrowly triangular, glabrous	Ovate, glabrous to sparsely puberulous along the midvein	Elliptic to narrowly triangular, setose along the midvein
Lower sepals	Ovate to widely ovate, sparsely pilose, pilose at base	Widely elliptic, glabrous	Ovate to widely ovate, glabrous	Ovate, glabrous	Triangular to widely trullate, glabrous
Paired petal limb	Pale lilac to lilac to light blue	White to light blue	Blue to sky blue	Pale lilac to lilac	White to light blue to blue
Antherodes	X-shaped, white	X-shaped, yellow	V-shaped, white	V-shaped, white	Scarcely X-shaped, white
Lateral anthers	White to cream-coloured, connective white	Yellow, connective pale yellow to yellow	Yellow, connective white to cream-coloured	Pale yellow to yellow, connective white to cream-coloured	Pale yellow to yellow, connective white to cream-coloured
Medial anther	Hastate, curved, white to cream-coloured, connective white	Linear-hastate, strongly curved, yellow, connective yellow	Narrowly sagittate, strongly curved, yellow, connective white to cream-coloured	Linear sagittate to narrowly sagittate, strongly curved, pale yellow to yellow, connective white to cream-coloured	Oblong-sagittate, curved, pale yellow to yellow, connective white to cream-coloured
Gynoecium	Ovary smooth, stigma truncate, white	Ovary smooth, stigma truncate, brownish-mauve to tan-coloured	Ovary smooth, stigma truncate, sky blue	Ovary verrucose, stigma capitate, yellow	Ovary smooth, stigma capitate, white
Capsules	Reddish-brown to dark maroon, opaque, 3-valved	Dark burgundy to atro-vinaceous to black, glaucous, indehiscent	Dark blue to bluish-black to black, glaucous, indehiscent	Tan-coloured, opaque, 3-valved	Tan-coloured, opaque, 3-valved
Seeds	Dimorphic, dark brown to black, ellipsoid (dorsal) or widely ellipsoid (ventral), ventrally flattened, slightly cleft towards the embryotega (dorsal) or not (ventral), testa shallowly rugose with some small furrows on the side opposed to the embryotega (dorsal) or irregularly rugose (ventral), farinae cream-coloured, embryotega semilateral (dorsal) or semilateral to lateral (ventral), with a prominent apicule, hilum longer than ½ the length of the seed (dorsal) or ca. ½ the length of the seed (ventral)	Monomorphic, dark grey to black, widely triangular to triangular-ellipsoid, ventrally flattened, slightly cleft towards the embryotega, testa rugose, farinae white, embryotega semilateral to semidorsal, without a prominent apicule, hilum on a strong ridge, ca the same length as the seed	Monomorphic, light brown to greyish-brown, triangular to triangular-ellipsoid, ventrally pyramidal, not cleft towards the embryotega, testa foveolate, farinae cream-coloured, embryotega semilateral to lateral, without a prominent apicule, hilum ca. the same length as the seed	Dimorphic, dark brown to black, ellipsoid (dorsal) or widely ellipsoid (ventral), ventrally flattened, slightly cleft towards the embryotega (dorsal) or not (ventral), testa shallowly rugose with some small furrows on the side opposed to the embryotega (dorsal) or shallowly rugose to irregularly rugose (ventral), farinae cream-coloured, embryotega semilateral (dorsal) or semilateral to lateral (ventral), with a prominent apicule, hilum longer than ½ the length of the seed (dorsal) or ca. ½ the length of the seed (ventral)	Dimorphic, dark brown to black, ellipsoid (dorsal) or triangular (ventral), ventrally flattened, cleft towards the embryotega (dorsal) or not (ventral), testa shallowly rugose with some small furrows on the side opposed to the embryotega (dorsal) or shallowly rugose to irregularly rugose (ventral), farinae cream-coloured, embryotega semilateral (dorsal) or semilateral to lateral (ventral), with a prominent apicule, hilum longer than ½ the length of the seed (dorsal) or ca. ½ the length of the seed (ventral)

Commelina bambusifolia Matuda
Figs 3–4; Table 2

Commelina bambusifolia Matuda (Matuda 1955: 62, fig. 1).

Etymology

The epithet derives from the New Latin '*bambusa*' (which derives from the Malay 'bambu') + Latin '*folia*' (meaning 'leaf'), in reference to its bamboo-like leaves.

Type material

MEXICO – **México** • Distrito de Valle de Bravo, La Junta; 9 Nov. 1954; fl., fr.; *E. Matuda et al. 31671*; lectotype: MEXU [MEXU00075534]!, designated by Espejo-Serna & López-Ferrari (1995); isolectotypes: MEXU [MEXU00142028]!, [MEXU00142029]!.

Selected material examined

MEXICO – **México** • Carretera entre Valle de Bravo y Colorín, ladera húmeda; 31 Aug. 1952; fl., fr.; *E. Matuda et al. 27005*; MEXU 2ex.

Description

Herbs 40–60 cm tall, ascending, perennial, robust, terrestrial. *Roots* fibrous, thin. *Rhizome* short. *Stems* monomorphic, ascending, branched at base; internodes 1.9–10.2 cm long, distally shorter, green, sparsely hispid to hispid with acicular hairs, hairs hyaline, with a sparse line of acicular hairs opposite to the leaves, hairs light brown. *Leaves* distichously-alternate, congested in the upper part of the stem, sessile; sheaths 1.1–2.9 cm long, light green, hirsute to densely hirsute with a mixture of prickle- and acicular hairs, hairs hyaline, margin upright, hirsute, hairs acicular, dark red to atro-vinaceous; blades 1.7–21.4 × 0.8–4.8 cm, narrowly oblong to narrowly elliptic, obliquely asymmetric, chartaceous, adaxially green to dark green, abaxially light green, adaxially hispid with a mixture of acicular and glandular hairs, hairs hyaline, abaxially hispid, hirsute along the midvein, hairs acicular, hyaline, base asymmetric, amplexicaulous to subamplexicaulous, margin flat, scabrid with prickle-hairs, apex acuminate to long-acuminate; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins 3–4 pairs, adaxially conspicuous, abaxially inconspicuous, becoming conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence or main florescence plus 1–5 co-florescences, restricted to the apex of the stems. *Inflorescences* terminal or apparently so, peduncle 6.4–8.9 mm long, shorter than ½ length of the spathe, straight, hispid with acicular hairs, hairs hyaline; spathe 2.2–2.9 × 1.9–3 cm, widely depressed ovate-triangular to depressed ovate-triangular, patent to the peduncle, concolourous with the leaves, internally conspicuously mucilaginous, base connate up to the apex or almost so, truncate, externally hispid to hirsute, hairs hyaline or rusty, margin flat, apex obtuse to acute, straight, veins 3–4 pairs, inconspicuous, becoming conspicuous when dry; upper cincinnus vestigial, flowerless, peduncle 9.1–12.3 mm long, included, gently recurved at pre-anthesis, anthesis, post-anthesis and fruit, sparsely puberulous with minute hook-hairs, hairs hyaline; lower cincinnus 1–2-flowered, flowers mainly bisexual, rarely staminate, peduncle 4.5–9.2 mm long, thickened in fruit, glabrous to sparsely puberulous with minute hook-hairs towards the apex. *Flowers* chasmogamous, strongly zygomorphic, enantiostylous (style gently dislocated to the opposite side to the medial stamen); floral buds 2.9–5.7 × 4.6–5.1 mm, obovoid, light green or white to light blue to pale lilac, glabrous; pedicel 4.1–6.8 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, glabrous; sepals hyaline, persistent and accrescent in fruit, dorsal sepal 3.8–4.2 × 1.7–2.8 mm, elliptic to triangular, concave, glabrous, apex acute, lower sepals 4.3–5.4 × 3.1–4.5 mm, shortly-clawed, connate up to the upper third, oblique-obovate to widely oblique-obovate, concave, glabrous, apex round; paired petals 7.8–10.1 × 4.5–5.8 mm, clawed, claw 2.6–3.8 mm long, white to light blue to pale lilac, limb 5.2–6.9 × 4.5–5.8 mm, widely

Fig. 3. *Commelina bambusifolia* Matuda; lectotype (MEXU00075534). Photo courtesy of the Universidad Nacional Autónoma de México.

transversally rhombic to widely depressed obovate, light blue to pale lilac, base asymmetric, cuneate, apex obtuse, medial petal 3.7–4.2 × 1.2–2.3 mm, sessile, lanceolate to ovate, entire, apex involute, discolourous with the paired petals, white, hyaline, glabrous on both sides, apex acuminate; staminodes 3, medial staminode equal to the laterals, filaments 3.2–3.1 mm long, straight to arcuate-recurved, white, base light green, apex yellowish-orange to cream-orange, antherodes 0.5–0.6 × 0.3–0.5 mm, X-shaped, yellow, minute pollen sacs between the upper and lower lobes present, non-polliniferous or producing very few grains, not apiculate between the upper lobes, upper lobes conspicuous, very widely obovate, larger than the lower, lower lobes widely oblong to subquadrangular; lateral filaments 3.8–4.5 mm long, almost straight to very gently sigmoid, white, base light green, apex yellowish-orange to cream-orange, anthers 1.8–2.2 × 1.2–1.5 mm, held with the medial anther, widely elliptic to widely ovate, orange-yellow to orange, pollen yellowish-orange to cream-orange, drying orange-yellow to apricot; medial filament 2.8–3.5 mm long, straight to arcuate-decurved, apex decurved, white, base light green, apex yellowish-orange to cream-orange, anther 1.9–2.7 × 0.6–0.8 mm, held with the lateral anthers, oblong to elliptic, slightly curved, orange-yellow to orange, connective oblong, orange, anther sacs not appressed to each other, pollen yellowish-orange to cream-orange, drying orange-yellow to apricot; ovary 0.9–1.5 × 0.7–1.2 mm, 3-carpellate, 5-ovulate, very widely fusiform to subglobose, green, smooth, puberulous with glandular microhairs, style 4.6–6.5 mm long, equalling or exceeding the stamens, very gently sigmoid, base tapering into the ovary, apex strongly involute, white, base light green, apex yellowish-orange to cream-orange, deciduous in fruit, stigma trilobate, tan-coloured. *Capsules* 1–2 per spathe, 8.2–9.8 × 6.1–7.5 mm, subglobose, sessile, fruit wall thin, apex round to 3-lobed, constricted between the seeds, off-white when mature, opaque, smooth, 3-locular, 3-valved, dorsal locule 0–1-seeded, dehiscent, ventral locules 0–1-seeded, dehiscent, valves splitting to base. *Seeds* monomorphic, 5.4–6.6 × 4.1–5.4 mm, all free from the capsule wall, widely ellipsoid, dorsiventrally compressed, ventrally flattened, slightly cleft towards the embryotega, brown to greyish-brown, testa smooth to inconspicuously foveolate, farinose, farinae white, embryotega semilateral, conspicuous, with a prominent apicule, hilum C-shaped, ca the same length as the seed.

Distribution

Commelina bambusifolia is endemic to central Mexico (Fig. 4).

Ecology

It grows in the understory of conserved patches of dry forests.

Phenology

It was found in bloom from July to November and with fruits in August and September.

Vernacular name

Hierba del pollo (central Mexico).

Conservation

Commelina bambusifolia has very narrow EOO (5472 km^2) and AOO (ca 64 km^2), being known from less than 20 collections from only five localities. Most of these collections were made between 1950 and 1999, with only six of them having been made between 2003 and 2019. There is no information on its populational trends or its current threats. Thus, we suggest *C. bambusifolia* should be considered Endangered [EN, B2ab(i, ii, iv)], following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations.

Remarks

Similar to *C. scabrata* due to their hirsute leaf-sheaths, blades narrowly oblong to narrowly elliptic, obliquely asymmetric, abaxially hirsute along the midvein, margin smooth, apex acuminate to long-acuminate, upper cincinnus vestigial and included, lower cincinnus glabrous, paired petals limb base cuneate, medial anther lacking a vinaceous to dark purple spot on the connective, fruits opaque off-white

Fig. 4. Distribution map for the *Commelina scabrata* complex. Green = Tropical and Subtropical Moist Broadleaf Forests; Pale Yellow = Tropical and Subtropical Dry Broadleaf Forests; Brown = Tropical and Subtropical Coniferous Forests; Tea Green = Temperate Broadleaf and Mixed Forests; Army Green = Temperate Coniferous Forest; Orange = Tropical and Subtropical Grasslands, Savannas and Shrublands; Beige = Temperate Grasslands, Savannas and Shrublands; Lilac = Flooded Grasslands and Savannas; Pink = Montane Grasslands and Shrublands; Olive Green = Mediterranean Forests, Woodlands and Scrubs; Red = Deserts and Xeric Shrublands; Teal = Mangroves and Coastal Environments.

Table 2. Diagnostic field characters for the gem-fruited species of the *Commelina robusta* group.

Characters	*Commelina bambusifolia*	*Commelina huntii*	*Commelina robusta*	*Commelina scabrata*	*Commelina sugariae* **sp. nov.**	*Commelina vestita*
Growth form	Ascending	Prostrate to ascending	Prostrate, ascending or scrambling	Ascending	Ascending	Erect
Pedicel	Glabrous	Glabrous	Glabrous	Glabrous	Puberulous at apex with glandular microhairs	Glabrous
Paired petal limb	Light blue to pale lilac, base cuneate	White, base subcordate to cordate	Pale lilac to lilac or light blue to blue, rarely white, base cordate to sagittate	Light blue to blue to sky blue, base cordate to sagittate	Sky blue, base cuneate	Sky blue, base cordate to sagittate
Medial petal	White, entire, apex involute, glabrous on both sides	White, 2-auriculate, apex involute, glabrous on both sides	Light blue to pale lilac, rarely white, entire, completely involute, abaxially puberulous at base with glandular microhairs	Light blue to pale lilac, entire, completely involute, glabrous on both sides	White, entire, apex involute, glabrous on both sides	White, entire, apex slightly involute, glabrous on both sides
Lateral anthers	Orange-yellow to orange	Pale orange-yellow to pale apricot-coloured tinted purple to atro-purpureous	Orange-yellow to orange	Orange-yellow to orange	Orange-yellow to apricot	Pale orange-yellow to pale apricot
Medial anther connective	Orange	Pale orange-yellow to pale apricot, with a vinaceous to atro-vinaceous spot at centre	Orange-yellow to orange, with an atro-vinaceous to maroon spot at centre	Orange	Orange-yellow to apricot, with an orange-brown spot at centre	Pale orange-yellow to pale apricot, with a vinaceous to atro-vinaceous spot at centre
Capsules	1–2 per spathe, off-white, opaque, smooth	1–2 per spathe, tan-coloured, shiny, sparsely black-papillose	3–5 per spathe, tan-coloured, shiny, smooth	1–2 per spathe, prismatic, off-white with tan-coloured speckles, opaque, verrucose	3–5 per spathe, tan-coloured, shiny, smooth	6–9 per spathe, tan-coloured when mature, shiny, smooth
Seeds	Monomorphic, brown to greyish-brown, free from the fruit wall, widely ellipsoid, slightly cleft towards the embryotega, testa smooth to inconspicuously foveolate, farinose with farinae white, embryotega semilateral, with a prominent apicule, hilum C-shaped and ca. the same length of the seed	Dimorphic, dark brown with orange-brown verrucae, adnate to (dorsal) or free from the fruit wall (ventral), ellipsoid, not cleft towards the embryotega, testa shallowly foveolate (dorsal) or foveolate (ventral), non-farinose (dorsal) or slightly farinose with farinae apricot, embryotega semilateral, without a prominent apicule, hilum linear (dorsal) or curved (ventral), ca. ½ the length of the seed	Dimorphic, brown to dark brown, adnate to (dorsal) or free from the fruit wall (ventral), widely ellipsoid (dorsal) or ellipsoid to reniform (ventral), slightly cleft towards the embryotega (dorsal) or not (ventral), testa foveolate (dorsal) or rugose-foveolate (ventral), non-farinose (dorsal) or slightly farinose with farinae white, embryotega semilateral, with a prominent apicule, hilum linear (dorsal) or curved (ventral), ca. ½ the length of the seed	Dimorphic, brown to dark brown, adnate to (dorsal) or free from the fruit wall (ventral), ellipsoid (dorsal) or ellipsoid to slightly falcate (ventral), slightly cleft towards the embryotega (dorsal) or not (ventral), testa shallowly foveolate (dorsal) or sparsely echinate (ventral), non-farinose (dorsal) or sparsely farinose with farinae wite, embryotega semidorsal (dorsal) or semilateral (ventral), with a prominent apicule (ventral) or not, hilum linear (dorsal) or ca. C-shaped (ventral) and ca. same length as the seed	Monomorphic, brown to dark brown, free from the fruit wall, ellipsoid, slightly cleft towards the embryotega, testa foveolate rugose-foveolate, slightly farinose with farinae white, embryotega semilateral, with a prominent apicule, hilum curved and longer than ½ the length of the seed	Dimorphic, brown to dark brown, adnate to (dorsal) or free from the fruit wall (ventral), ellipsoid (dorsal) or ellipsoid to reniform (ventral), slightly cleft towards the embryotega (dorsal) or not (ventral), testa foveolate (dorsal) or rugose-foveolate (ventral), non-farinose (dorsal) or slightly farinose with farinae white, embryotega semilateral, with a prominent apicule, hilum linear, ca. ½ the length of the seed and on a weak ridge (dorsal) or curved and ca. ½ the length of the seed (ventral)

when mature, and all locules 1-seeded (Table 2). However, it can be differentiated by its leaf-blades adaxially glandular-pubescent with hyaline hairs (vs hispid on both sides with rusty or hyaline hairs in *C. scabrata*), base amplexicaulous to subamplexicaulous (vs cuneate), paired petals limb light blue to pale lilac (vs sky blue), fruits subglobose, smooth, apex round to 3-lobed and 3-valved with valves splitting to base (vs prismatic, sparsely verrucose, apex aristate, consistently parasitised by weevil larvae, unequally 2-valved, ventral valves splitting only up to mid-length), and seeds monomorphic and free from the fruit wall (vs dimorphic, dorsal seed adnate to the fruit wall and septa, and ventral seeds free from the fruit wall) (Table 2).

Commelina efoveolata (C.B.Clarke) L.M.Campb.
Figs 5–6; Table 1

Commelina efoveolata (C.B.Clarke) L.M.Campb. (Campbell in Hokche *et al.* 2008: 714). – *Commelina efoveolatum* (C.B.Clarke) L.M.Campb. (Campbell in Hokche et al. 2008: 714), orth. var. – *Phaeosphaerion efoveolatum* C.B.Clarke (Clarke 1881: 136). – *Phaeosphaerion efoveolatum* C.B.Clarke var. *efoveolatum* (Clarke 1881: 136). – *Athyrocarpus efoveolatus* (C.B.Clarke) Kuntze (Kuntze 1898: 319).

Etymology

The epithet is a combination of the Latin prefix '*ē-*' (meaning 'opposition') + '*fovea*' (meaning 'hole, pit, cavity') + the suffix '*-ole*' (indicating a diminutive) + the suffix '*-ātum*' (indicating the possession of a particular feature), in reference to its seeds lacking foveolas, distinguishing it from *C. leiocarpa*.

Type material

VENEZUELA – **Aragua** • prope Colonia Tovar, valley of San Carlos; 1854–1855; fl., fr.; *A. Fendler 1555*; lectotype: GH [GH00029569]!, designated by Hassemer (2020); isolectotype: K [K000363241]!.

Selected material examined

Central America

COSTA RICA – **San José** • vicinity of El General; Nov. 1936; fl.; *A.F. Skutch 2893*; K.

HONDURAS – **El Paraíso** • slopes above Yuscarán, Montserrat; 25 Nov. 1958; fl.; *J.G. Hawkes et al. 2051*; K.

NICARAGUA – **Matagalpa** • Finca La Castilla, plantaciones de café; 21 Jan. 1982; fl., fr.; *D. Castro 2353*; HNMN, K, MO, US.

PANAMA – **Panamá** • Canal Zone, Corozal; 18 Dec. 1923; fl.; *P.C. Standley 27343*; F, US.

South America

COLOMBIA – **Magdalena** • Santa Marta; 1898–1899.; fl., fr.; *H.H. Smith 2289*; BR, CM, K, MO, P, VT.

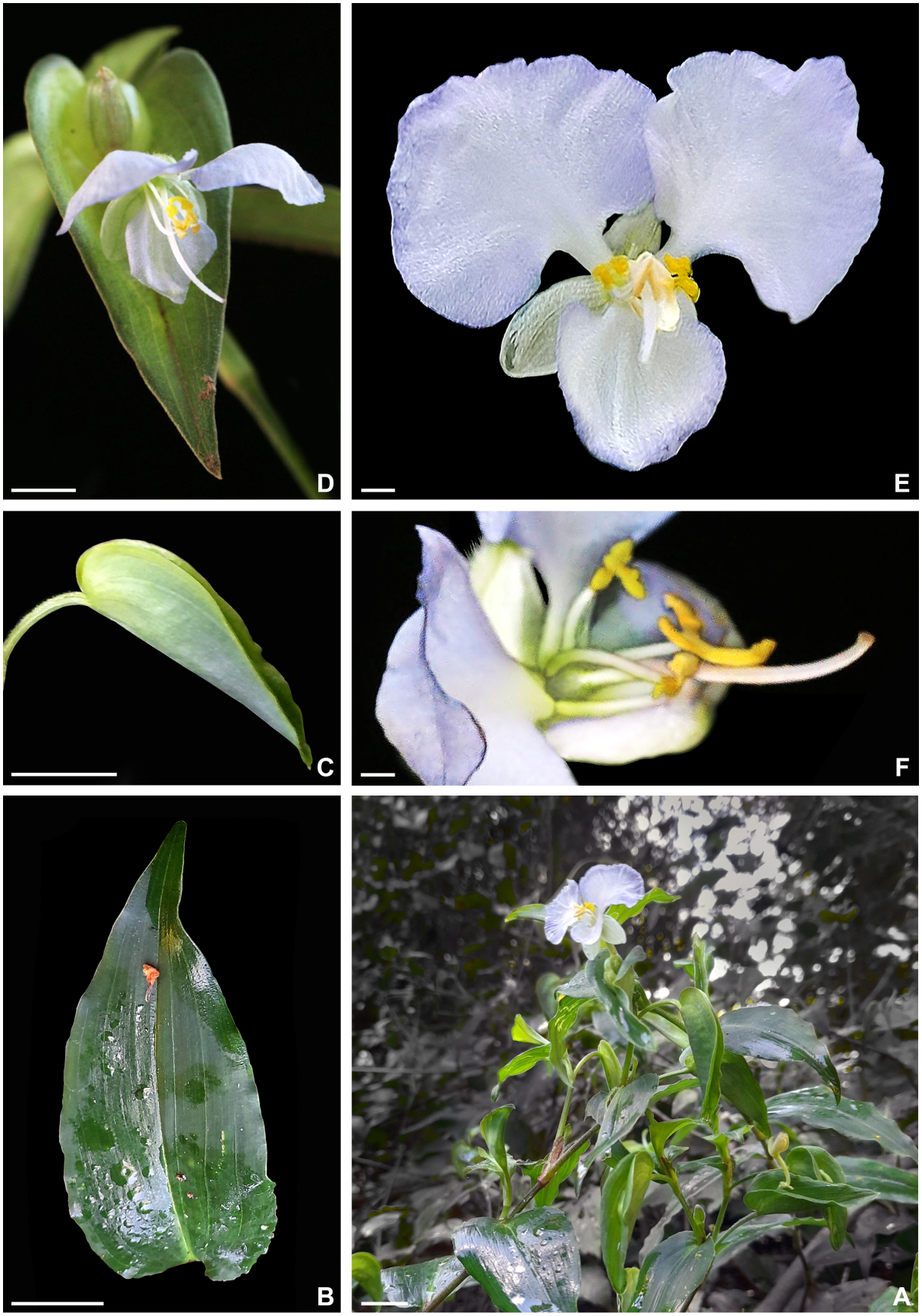
VENEZUELA – **Distrito Federal** • Cerro Avila, Quebrada Chacaito; 23 Dec. 1975; fl.; *B. Manara s.n.*; K [K003932703], VEN.

Description

Herbs 30–150 cm tall, scrambling to scrambling-fruticose, perennial, medium-sized to robust, terrestrial or rupicolous. *Roots* tuberous, cylindric. *Rhizome* short. *Stems* dimorphic, fibrous, branched from the base or almost so, primary branches scrambling to ascending, rooting only at the base, secondary branches longer than the primary branches, scrambling or twining, apex suberect to ascending; internodes 1.1–11.2 cm long, distally shorter, green, sometimes suffused with dark red to vinaceous, sparsely pilose with

acicular hairs, hairs hyaline. *Leaves* distichously-alternate, evenly distributed along the upper part of the stem, pseudopetiolate; sheaths 0.3–1.8 cm long, light green suffused with dark red to vinaceous, sparsely to densely hispid, hairs acicular, hyaline, margin upright, sparsely to densely hispid, hairs acicular, hyaline; pseudopetiole inconspicuous to up to 4.5 mm long; blades 1.5–12.4 × 0.6–3.1 cm, narrowly elliptic to elliptic to lanceolate, straight, membranous to thinly chartaceous, adaxially dark green, abaxially light green, adaxially sparsely to densely hispid, hairs acicular, hyaline, abaxially sparsely to densely hispid, hairs generally congested along the midvein, acicular, hyaline, base asymmetric, obtuse to round, margin flat, scabrid or ciliate with a mixture of prickle- and acicular hairs, hyaline to light brown, apex acuminate to long-acuminate; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins 3–4 pairs, adaxially conspicuous, abaxially inconspicuous, becoming conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence, restricted to the apex of the stems and forming a dense second-degree synflorescence. *Inflorescences* leaf-opposed, peduncle 0.9–4.3 cm long, the same length or longer than ½ length of the spathe, pendulous, pilose with acicular hairs, with a line of minute acicular hairs opposed to the spathe, hairs hyaline; spathe 1.8–4.5 × 1.3–3.2 cm, cordate, continuous to the peduncle and pointing downwards, internally inconspicuously mucilaginous, base free, cordate, externally sparsely to densely hispid, hairs acicular, hyaline to light brown, apex acuminate, slightly falcate, veins 4–5 pairs, inconspicuous, becoming conspicuous when dry; upper cincinnus vestigial, flowerless, peduncle inconspicuous or up to 2.3 mm long, included, gently recurved at pre-anthesis and anthesis, recurved and exserted at post-anthesis and fruit, glabrous with some odd hook-hairs towards the apex, hairs hyaline; lower cincinnus 1–3-flowered, flowers mainly bisexual, rarely staminate, peduncle 0.8–1.7 cm long, thickened in fruit, sparsely puberulous with minute hook-hairs. *Flowers* chasmogamous, zygomorphic, enantiostylous (style gently dislocated to the opposite side to the medial stamen); floral buds 3.5–7.4 × 2.1–5.7 mm, obovoid, light green or white to pale lilac-blue to light blue, pilose with acicular hairs, hairs hyaline; pedicel 2.8–7.5 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, sparsely puberulous with minute hook-hairs, hairs hyaline; sepals light green, opaque, early deciduous in fruit, dorsal sepal 3.8–6.1 × 2.4–4.5 mm, elliptic to narrowly triangular, concave, pilose along the midvein with acicular hairs, hairs hyaline, apex acute, lower sepals 4.4–6.3 × 3.6–4.2 mm, sessile, free, widely elliptic, concave, glabrous, apex obtuse; paired petals 0.8–1.4 × 0.8–1.2 cm, clawed, claw 2.3–5.8 mm long, white, limb 5.8–7.9 × 8.7–11.6 mm, widely reniform to widely rhombic-reniform, white to pale lilac-blue to light blue, base asymmetric, subtruncate, apex obtuse, medial petal 4.8–7.4 × 4.8–7.2 mm, shortly-clawed, claw 0.2–0.5 mm long, white, limb 4.6–6.9 × 4.8–7.2 mm, widely sagittate, entire, concave, opaque, concolourous with the paired petals, opaque, glabrous on both sides, apex obtuse to round; staminodes 2, medial staminode completely absent, filaments 2.4–4.6 mm long, straight to arcuate-decurved, white, base light green, antherodes 0.5–0.8 × 0.9–1.4 mm, X-shaped, yellow, minute pollen sacs between the upper and lower lobes present, non-polliniferous or producing very few grains, not apiculate between the upper lobes, upper lobes conspicuous, spathulate to obovate, smaller than the lower, lower lobes spathulate to obovate; lateral filaments 5.2–7.1 mm long, gently sigmoid, geniculate distal to the middle, apex recurved, white, base light green, anthers 1.1–1.7 × 0.6–0.9 mm, held near the antherodes and medial anther, sagittate, yellow, connective pale yellow to yellow, pollen pale yellow, drying yellow; medial filament 3.1–4.4 mm long, straight to gently arcuate-recurved, apex decurved, white, base light green, anther 3.5–4.7 × 1.2–1.9 mm, held near the antherodes and lateral anthers, linear-hastate, strongly curved, yellow, connective hastate, yellow, anther

Fig. 5 (next page). *Commelina efoveolata* (C.B.Clarke) L.M.Campb. **A**. Habit. **B**. Leaf. **C–D**. Inflorescence. **C**. Side view of the inflorescence. **D**. Oblique view of the inflorescence showing a bisexual flower and an immature fruit. **E–F**. Flower. **E**. Front view of a bisexual flower. **F**. Close-up of a bisexual flower showing the androecium and gynoecium. Photos: A–C, E by G.E. Huamani (iNaturalist 99267736, unvouchered); D, F by O.M. Montiel (*W.D. Stevens & O.M. Montiel J. 26776*, MO). Scale bars: A–C = 1 cm; D = 5 mm; E–F = 1 mm.


D
E
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B
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sacs appressed to each other for the upper ⅔, basal third with divergent anther sacs, pollen pale yellow, drying yellow; ovary 2.3–3.5 × 1.2–2.3 mm, 3-carpellate, 5-ovulate, ellipsoid to widely ellipsoid, green, smooth, glabrous, style 4.8–7.1 mm long, twice as long as the stamens, sigmoid, base tapering into the ovary, apex recurved, white, base light green, persistent in fruit, stigma truncate, tan-coloured to brownish-mauve. *Capsules* 1–3 per spathe, 5.2–8.4 × 4.8–8.2 mm, subglobose to globose, sessile, fruit wall thick,

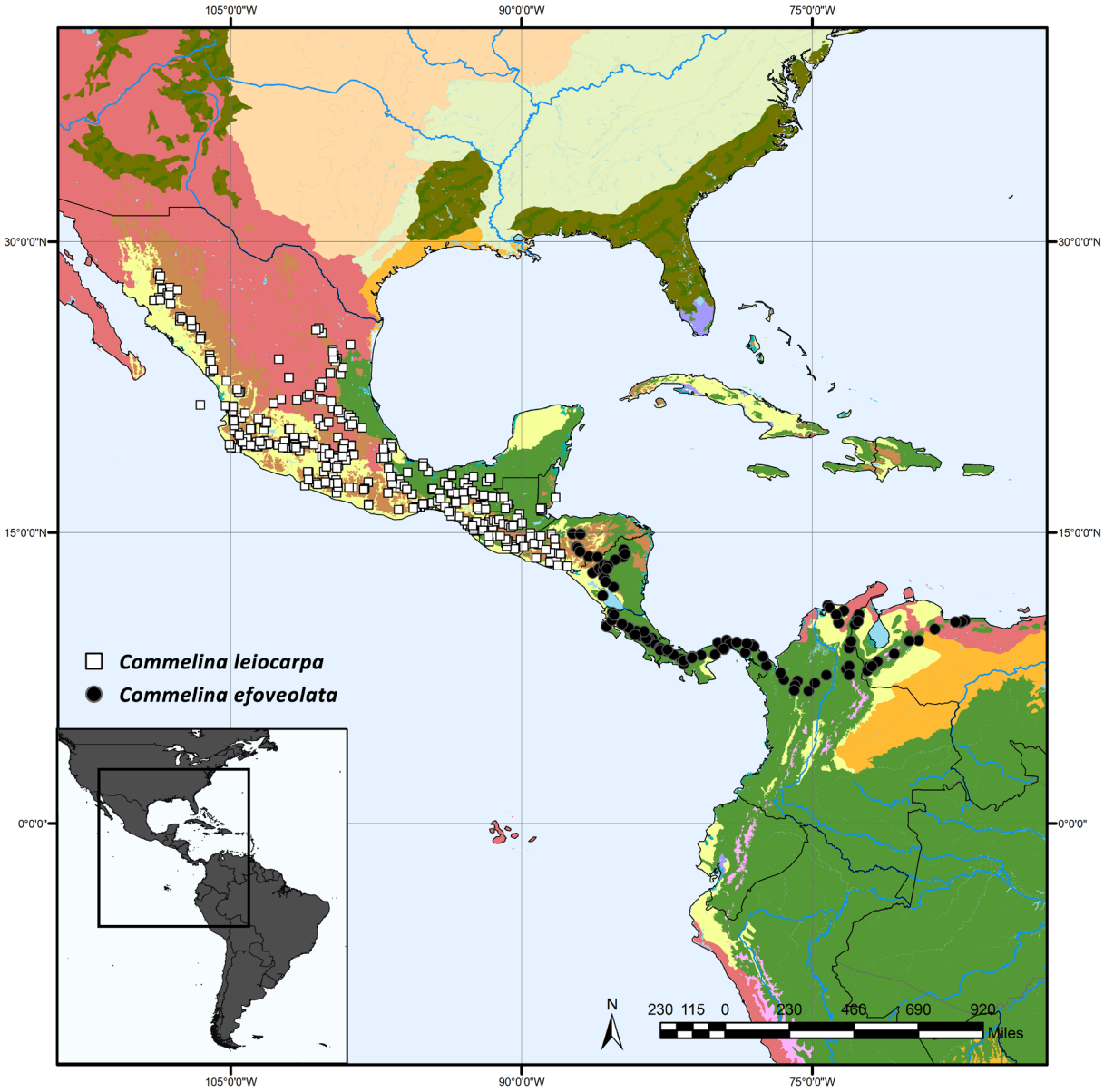


Fig. 6. Distribution map for the *Commelina leiocarpa* complex. Green = Tropical and Subtropical Moist Broadleaf Forests; Pale Yellow = Tropical and Subtropical Dry Broadleaf Forests; Brown = Tropical and Subtropical Coniferous Forests; Tea Green = Temperate Broadleaf and Mixed Forests; Army Green = Temperate Coniferous Forest; Orange = Tropical and Subtropical Grasslands, Savannas and Shrublands; Beige = Temperate Grasslands, Savannas and Shrublands; Lilac = Flooded Grasslands and Savannas; Pink = Montane Grasslands and Shrublands; Red = Deserts and Xeric Shrublands; Teal = Mangroves and Coastal Environments.

apex apiculate due to the persistent style base, not constricted between the seeds when mature, dark burgundy to atro-vinaceous to black when mature, glaucous, smooth, 3-locular, indehiscent, dorsal locule 1-seeded, indehiscent, ventral locules 2-seeded, indehiscent. *Seeds* monomorphic, 3–4.2 × 3.2–3.6 mm, free from the capsule wall, widely triangular to triangular-ellipsoid, dorsally flattened, ventrally flattened, slightly cleft towards the embryotega, dark grey to black, testa rugose, densely farinose, farinae white, embryotega semilateral to semidorsal, inconspicuous, without a prominent apicule, hilum linear, on a strong ridge, ca the same length as the seed.

Distribution

Commelina efoveolata ranges from southern Honduras to Colombia and Venezuela (Fig. 6).

Ecology

It grows in the understory of montane forests of Central America and northern South America.

Phenology

It was found in bloom and fruits from November to January.

Vernacular name

Canutillo morado (Venezuela).

Conservation

Commelina efoveolata presents a wide EOO (1 042 015 km^2) but a considerably narrow AOO (ca 444 km^2). This difference can be explained by the relatively small number of known records. Almost all known collections were made before 1990, with few extant populations confirmed by photographic records (iNaturalist observations 101449082; 106104484; 101678538; 247428520; 99267736). There is no further information on its populational trends. However, the montane forests of Central and northern South America are currently threatened by deforestation and urban growth. Thus, following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations, we suggest *C. efoveolata* be assessed as Vulnerable [VU, B2b(iii, iv, v), c(iii, iv)].

Remarks

Commelina efoveolata has been historically considered a synonym of *C. leiocarpa*, exclusively due to their indehiscent, glaucous and dark-coloured fruits. Campbell (2008) transferred *Phaeosphaerion efoveolatum* C.B.Clarke to *Commelina* as distinct from *C. leiocarpa* but provided no explanation or rationale for that decision. Nonetheless, both species are morphologically distinct (Figs 5, 9), with their distribution overlapping slightly only in Honduras and Nicaragua (Fig. 6). They differ in stem branching pattern and pubescence (branched from the base or almost so, sparsely to densely hispid with acicular hairs in *C. efoveolata* vs branched in the upper half or upper third, scabrid with a mixture of prickle- and hook-hairs in *C. leiocarpa*), leaf-blade pubescence (adaxially sparsely to densely hispid with acicular hairs, abaxially sparsely to densely hispid with acicular hairs, hairs generally congested along the midvein vs adaxially glabrous to scabrid with a mixture of prickle- and hook-hairs, sometimes also sparsely pilose along the midvein, abaxially scabrid with a mixture of prickle- and hook-hairs and pilose along the midvein), leaf-blade margin (ciliate with a mixture of prickle- and acicular hairs vs papillose), spathe pubescence (externally sparsely to densely hispid with acicular hairs, margin scabrid or ciliate with prickle- or acicular hairs vs externally glabrous to scabrid with a mixture of prickle- and hook-hairs), sepal pubescence (dorsal sepal pilose along the midvein vs glabrous), petal colouration (white to light blue vs sky blue), antherodes colouration and morphology (yellow, upper lobes conspicuous, lower lobes spathulate to obovate vs white, upper lobes absent, lower lobes filiform), mature fruit colouration (dark burgundy to atro-vinaceous to black vs dark blue to bluish-black to black), and seed morphology (not cleft towards the embryotega, testa shallowly rugose vs cleft towards the embryotega, testa foveolate) (Table 1). Thus, we reestablish *C. efoveolata* as an accepted and morphologically diagnosable species.

Commelina huntii M.Pell.
Figs 7–8; Table 2

Commelina huntii M.Pell. (Pellegrini in Pellegrini & Forzza 2017: 67, fig. 3–5).

Etymology

Named after the British botanist Dr David R. Hunt in recognition of his extensive contribution to Commelinaceae systematics worldwide, especially his contributions to Tradescantieae Meisn. and the gem-fruited *Commelina*.

Type material

BRAZIL – **Rio de Janeiro** • Itatiaia, Parque Nacional do Itatiaia, subida para o brejo da Lapa, beira de estrada; 24 Jan. 2012; fl., fr.; *M.O.O. Pellegrini & L.S. Sylvestre 191*; holotype: RB [RB01025642]!; isotypes: SPF!, US!.

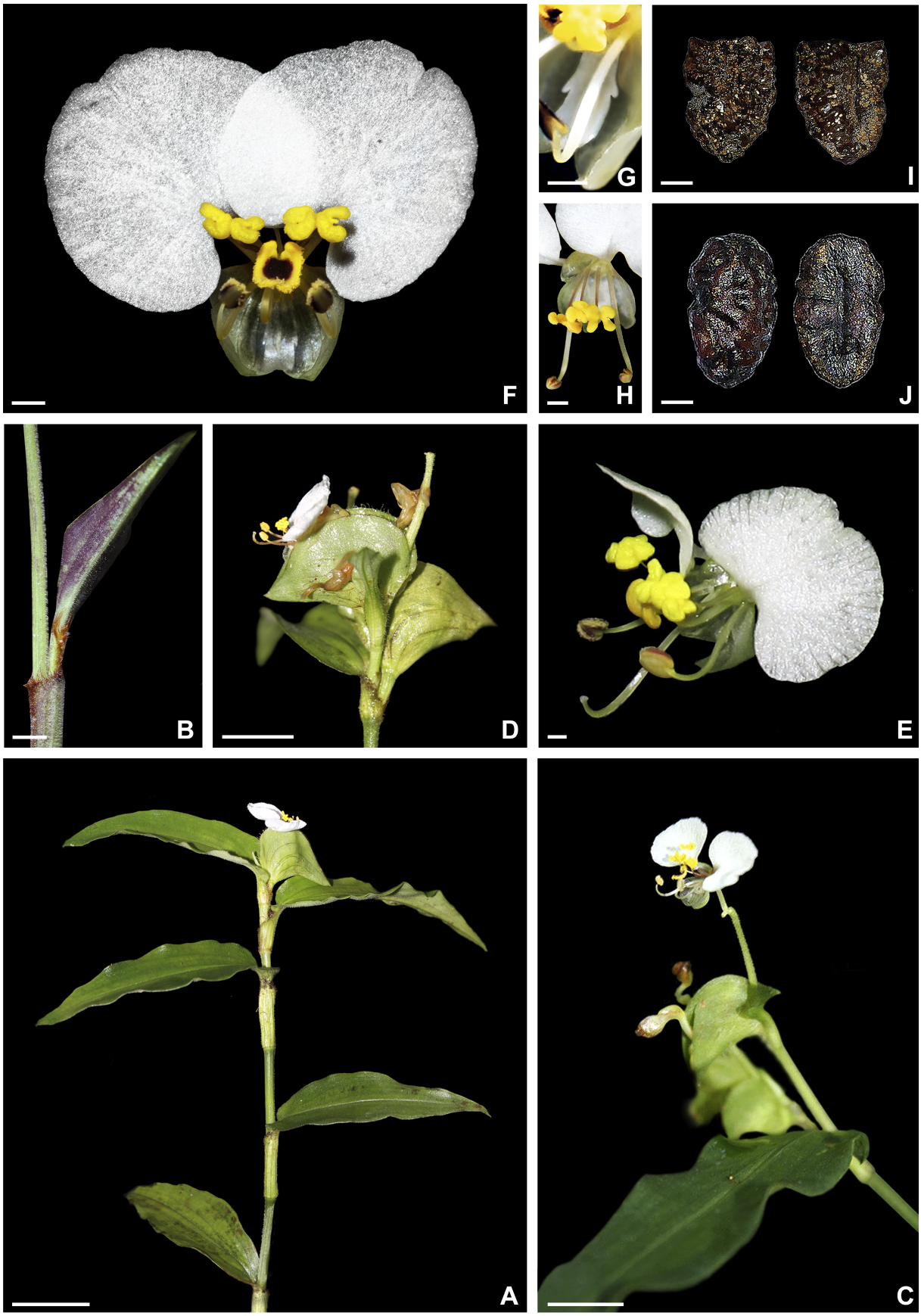
Selected material examined

BRAZIL – **Minas Gerais** • Lima Duarte, Parque Estadual do Ibitipoca, Conceição do Ibitipoca, gruta do Pião; 18 Jan. 2005; fl.; *R.C. Forzza et al. 3926*; RB, SPF, UEC. – **Rio de Janeiro** • Itatiaia, Parque Nacional do Itatiaia, estrada para parte alta, arredores do Brejo da Lapa, Floresta Ombrófila Densa Alto-Montana; fl.; 7 Dec. 2017; *M.B. Plumm et al. 102*; RFA. – **São Paulo** • Itararé, divisa entre as Fazendas Santa Andreia e Prieto; 14 May 1989; fl.; *C.A.M. Scaramuzza & V.C. Souza 259*; ESA.

Description

Herbs 15–50 cm tall, prostrate to ascending, perennial, delicate, terrestrial. *Roots* fibrous, thin. *Rhizome* short. *Stems* monomorphic, base prostrate, apex ascending, branched throughout; internodes 2.2–11.1 cm long, distally shorter, light green to green, minutely velutine to minutely pilose, with a line of acicular hairs opposite to the leaves, hairs hyaline. *Leaves* distichously-alternate, slightly congested at the apex of the stem, sessile; sheaths 1.4–2.6 cm long, light green, sometimes suffused purple or vinaceous, longitudinally striated green, pilose, hairs acicular, hyaline, with a line of setose hairs opposite to the leaves, hairs acicular, rusty to rusty-brown, margin upright, densely setose, hairs acicular, rusty to rusty-brown; blades 3.3–11.6 × (0.9–)1.6–3.3 cm, lanceolate to ovate-lanceolate, rarely ovate, straight, chartaceous, adaxially dark green to green, abaxially light green to light green tinted vinaceous to completely vinaceous, adaxially scabrid with prickle-hairs, abaxially minutely villous, pilose along the midvein, hairs hyaline, base asymmetric, obtuse, rarely cuneate, margin flat, scabrid with prickle-hairs, apex acuminate; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins (3–)4–6 pairs, adaxially conspicuous, abaxially inconspicuous, becoming more conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence or main florescence plus 1–3 co-florescences, restricted to the apex of the stems. *Inflorescences* terminal or apparently so, peduncle 1.3–5.5 mm long, rarely inconspicuous, shorter than ½ length of the spathe, straight, puberulous

Fig. 7 (next page). *Commelina huntii* M.Pell. **A**. Habit. **B**. Detail of the stems, leaf-sheath and abaxial side of the leaf. **C–D**. Inflorescence. **C**. Reproductive branch showing several inflorescences. **D**. Close-up of a reproductive branch showing inflorescences. **E–H**. Flower. **E**. Side view of a bisexual flower. **F**. Front view of a staminate flower. **G**. Close-up of a staminate flower showing the 2-auriculate medial petal. **H**. Close-up of the androecium. **I–J**. Seeds. **I**. Dorsal and ventral view of a ventral locule seed. **J**. Dorsal and ventral view of the dorsal locule seed. Photos: A, E–F by H. Dolsan (unvouchered); B–D, G by M.O.O. Pellegrini (holotype, *M.O.O. Pellegrini & L.S. Sylvestre 191)*; H by M.S. Wrängler (*H M.S. Wängler et al. 1565*, RB). Scale bars: A, C–D = 1 cm; B = 2 mm; E–J = 1 mm.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to densely puberulous with minute hook-hairs, hairs hyaline; spathe 0.7–2 × 1.4–3.2 cm, depressed ovate to subcordate, patent to the peduncle, concolourous with the leaves, internally conspicuously mucilaginous, base connate up to mid-length, truncate to subcordate, externally minutely villous with eventual cilia, hairs hyaline, cilia rusty to rusty-brown, margin flat, apex obtuse to acute, usually slightly falcate, veins 3–4 pairs, inconspicuous, becoming conspicuous when dry; upper cincinnus developed, 2–5-flowered, flowers mainly staminate, sometimes bisexual, peduncle (0.7–)1.7–2.4 cm long, exserted, gently decurved at pre-anthesis, anthesis, post-anthesis and fruit, sparsely to densely puberulous with minute hook-hairs, hairs hyaline; lower cincinnus 2–4-flowered, flowers mainly bisexual, sometimes staminate, peduncle 0.5–1 cm long, thickened in fruit, glabrous to sparsely puberulous with minute hook-hairs. *Flowers* chasmogamous, strongly zygomorphic, enantiostylous (style dislocated to the opposite side to the medial stamen); floral buds 3.1–4.4 × 1.6–3.2 mm, obovoid, white to light green, glabrous; pedicel 1.6–4.7 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, glabrous; sepals hyaline, persistent and accrescent in fruit, dorsal sepal 3.4–4.2 × 1.1–1.4 mm, elliptic, concave, glabrous, apex round, lower sepals 4.1–6.2 × 2.2–3.9 mm, shortly-clawed, connate up to mid-length, oblique-obovate, glabrous, apex round; paired petals 4.2–6.9 × 3.2–5.4 mm, clawed, claw 1.1–2 mm long, white to pale vinaceous, limb 3.9–5.3 × 3.2–5.4 mm, widely rotund to rotund-reniform, white, base asymmetric, subcordate to cordate, apex round to slightly emarginate, medial petal 3.1–4 × 1–1.4 mm, sessile, oblong to oblong-spathulate, 2-auriculate, apex involute, concolourous with the paired petals, hyaline, glabrous on both sides, apex obtuse to round; staminodes 3, medial staminode equal to the laterals, filaments 2.8–3.6 mm long, arcuate-recurved, apex recurved to strongly recurved, white, tan-coloured to vinaceous, antherodes 1–1.2 × 1.2–1.6 mm, X-shaped, yellow, minute pollen sacs between the upper and lower lobes present, non-polliniferous or producing very few grains, not apiculate between the upper lobes, upper lobes conspicuous, very widely obovate, larger than the lower, lower lobes widely obovate; lateral filaments 5.1–6.6 mm long, gently sigmoid, geniculate distal to the middle, apex recurved, white, base light green, apex tan-coloured to vinaceous, anthers 1.1–1.6 × 0.5–1 mm, held near to the medial anther, oblong to elliptic, pale orange-yellow to pale apricot-coloured, margin tinted purple to atro-purpureous, connective pale orange-yellow to pale apricot-coloured, margin tinted purple to atro-purpureous, pollen yellowish-orange to cream-orange, drying orange-yellow to pale apricot; medial filament 2.2–2.8 mm long, straight to arcuate-recurved, apex recurved to strongly recurved, white, apex sometimes tan-coloured to vinaceous, anther 1.5–2.6 × 1.3–2.4 mm, held near the antherodes and lateral anthers, widely oblong to widely elliptic, slightly curved, pale orange-yellow to pale apricot, connective shield-shaped, pale orange-yellow to pale apricot, with a vinaceous to atro-vinaceous spot at centre, anther sacs not appressed to each other, pollen yellowish-orange to cream-orange, drying orange-yellow to pale apricot; ovary 0.9–1.4 × 0.6–1 mm, 3-carpellate, 5-ovulate, oblongoid, light green, sparsely papillose, papillae black, puberulous with glandular microhairs, style 7.3–11.3 mm long, equalling or exceeding the stamens, sigmoid, base cylindric, apex strongly recurved, white, base light green, apex tan-coloured, deciduous in fruit, stigma trilobate, white. *Capsules* 1–2 per spathe, 5.5–8.1 × 3.9–5 mm, obovoid, sessile, fruit wall thin, apex truncate to round, constricted between the seeds, tan-coloured when mature, shiny, sparsely papillose, papillae black, 3-locular, unequally 2-valved, dorsal locule 1-seeded, indehiscent, ventral locules 2-seeded, dehiscent, valves splitting to base. *Seeds* dimorphic, dark brown with orange-brown verrucae; dorsal locule seed 3.4–4.2 × 2.8–3.3 mm, adnate to the fruit wall, ellipsoid, strongly dorsiventrally compressed, ventrally flattened, not cleft towards the embryotega, testa shallowly foveolate, non-farinose, embryotega semilateral, inconspicuous, without a prominent apicule, hilum linear, ca ½ the length of the seed, on a weak ridge; ventral locule seeds 2.7–4 × 2–2.4 mm, free from the fruit wall, ellipsoid, truncate at one end, ventrally flattened, not cleft towards the embryotega, testa foveolate, sparsely farinose, farinae apricot, embryotega semilateral, inconspicuous, without a prominent apicule, hilum curved, ca ½ the length of the seed, on a weak ridge.

Distribution

Endemic to the states of Minas Gerais, Rio de Janeiro, and São Paulo, Brazil (Fig. 8).

Ecology

Commelina huntii grows in the understory of moist and shaded nebular forests in the Atlantic rainforest biome, generally near water bodies at elevations from 800 to 1700 m above sea level. In rare cases, it can also be found in open, sometimes disturbed, areas.

Fig. 8. Distribution map for *Commelina huntii* M.Pell. and *C. rufipes* Seub. Green = Tropical and Subtropical Moist Broadleaf Forests; Pale Yellow = Tropical and Subtropical Dry Broadleaf Forests; Brown = Tropical and Subtropical Coniferous Forests; Tea Green = Temperate Broadleaf and Mixed Forests; Army Green = Temperate Coniferous Forest; Orange = Tropical and Subtropical Grasslands, Savannas and Shrublands; Beige = Temperate Grasslands, Savannas and Shrublands; Lilac = Flooded Grasslands and Savannas; Pink = Montane Grasslands and Shrublands; Olive Green = Mediterranean Forests, Woodlands and Scrubs; Red = Deserts and Xeric Shrublands; Teal = Mangroves and Coastal Environments.

Phenology

Commelina huntii blooms from November to June and fruits from December to March, rarely in June.

Vernacular names

Trapoeraba branca (Brazil), trapoeraba da Bocáina (Brazil).

Conservation

Despite the wide EOO (130 546 km^2), the AOO (ca 196 km^2) is considerably reduced. Following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations, Pellegrini & Forzza (2017) suggested *C. huntii* should be considered Endangered (EN), but with the incorrect criteria and subcriteria. Observed populations tend to have few mature individuals (ca 40), and clonal reproduction seems to be the prevalent and most successful strategy (Pellegrini, pers. obs.). Populations are commonly threatened by a decrease in habitat quality (mainly due to competition with invasive species) and deforestation. Thus, based on updated and improved data, we update and improve the conservation assessment for *C. huntii* as Endangered (EN) based on further criteria [B2ab(ii, iii), c(iv)+C2a(i)].

Remarks

Commelina huntii can be recognised by its white flowers with an auriculate medial petal and sparsely papillose ovary and capsules. It is similar to *C. obliqua* and *C. rufipes* due to their white flowers and rusty hairs on the leaf-sheaths. However, it can be readily distinguished from both species by its spathe base connate for 3–6 mm (vs only basally connate), auriculate medial petal without a medial constriction (vs entire with a constriction in *C. obliqua*—previously known as *C. rufipes* var. *glabrata* (D.R.Hunt) Faden & D.R.Hunt; see comments below—, and entire without a medial constriction in *C. rufipes*), fruits dehiscent, ellipsoid, tan-coloured and not crustaceous (vs indehiscent, pearly-white to silvery and crustaceous for both species, widely ellipsoid to widely oblongoid in *C. obliqua*, and subglobose to globose in *C. rufipes*), and by its free and ornamented seeds (vs seeds adnate to the fruit septa, forming a dispersal unit, with smooth to inconspicuously foveolate testa).

Commelina huntii is most similar to *C. robusta* Kunth due to its oblique leaf-blades, persistently connate spathe base, dehiscent capsules, and ventral seeds free with foveolate testa (Table 2). Nevertheless, *C. huntii* can be distinguished by its densely setose leaf-sheath margin with rusty to rusty-brown hairs (vs leaf-sheath margin long-ciliate with red to dark red to atro-vinaceous hairs in *C. robusta*), petals white (vs blue to light blue to lilac to pale lilac), paired petals limb widely rhombic to rhombic reniform (vs widely ovate to widely ovate reniform), medial petal concave and 2-auriculate (vs involute and entire), anthers of the lateral stamens light yellow to cream-coloured with margin tinted vinaceous (vs completely orange); ovary and capsules sparsely black papillate (vs smooth), 1–2 capsules per spathe (vs 5–7), seeds with apricot-coloured farinae (vs seeds white-farinose), and dorsal locule seeds with shallowly foveolate testa (vs rugose-foveolate testa) (Table 2).

Commelina leiocarpa Benth.

Figs 6, 9; Table 1

Commelina leiocarpa Benth. (Bentham 1846: 176). – *Phaeosphaerion leiocarpum* (Benth.) Hassk. (Hasskarl 1866: 212). – *Phaeosphaerion leiocarpum* (Benth.) Hassk. var. *leiocarpum* (Hasskarl 1866: 212). – *Athyrocarpus leiocarpus* (Benth.) Benth. & Hook.f. ex Hemsl. (Hemsley 1885: 386).

Phaeosphaerion efoveolatum var. *repens* C.B.Clarke (Clarke 1881: 136). – **Type:** COUNTRY UNKNOWN • s.loc.; s.dat.; fl., fr.; *s.coll. s.n.*; holotype: G [G00301518]!.

Etymology

The epithet is a combination of the Ancient Greek terms '*λεῖος*' (*leîos*, meaning 'smooth') + '*καρπός*' (*karpós*, meaning 'fruit'), in reference to its smooth and indehiscent capsules.

Type material

HONDURAS – **Tiger Island** • Gulf of Fonseca; s. dat.; fl., fr.; *A. Sinclair s.n.*; lectotype: K [K000363260]!, designated by Hassemer (2018b); isolectotype: K [K000363261]!.

Selected material examined

North America

MEXICO – **Colima** • s.loc.; 9 Jan.–6 Feb. 1891; fl., fr.; *E. Palmer 1147*; K, US 3ex.

Central America

BELIZE – **Toledo** • in acahual, on hill slope near San Antonio; 5 Nov. 1951; fl., fr.; *P.H. Gentle 7509*; K, MEXU, MO, US.

EL SALVADOR – **Ahuachapán** • vicinity of Ahuachapán; 9 Jan. 1922; fl., fr.; *P.C. Standley 19805*; F, MO, US.

GUATEMALA – **Retalhuleu** • Retalhuleu; 14 Jan. 1907; fl., fr.; *W.A. Kellerman 6052*; US 2ex.

HONDURAS – **Intibucá** • alrededores de Yamaranguila, llanos El Obispo; Jul. 1973; fr.; *J.R. Martínez & C. Bejarano 127*; MO, TEFH.

Description

Herbs 50–200 cm tall, scrambling-fruticose to erect-fruticose, perennial, robust, terrestrial. *Roots* tuberous, cylindric. *Rhizome* short. *Stems* dimorphic, fibrous, branched in the upper half or upper third, primary branches erect, secondary branches longer than the primary branches, scrambling or twining, apex patent; internodes 1.4–11.5 cm long, distally shorter, green suffused with red to completely red, scabrid with a mixture of prickle- and hook-hairs, hairs hyaline. *Leaves* distichously-alternate, pseudopetiolate; sheaths 0.9–2.5 cm long, light green suffused with red to completely red, scabrid with a mixture of prickle- and hook-hairs, hairs hyaline, margin upright, setose, hairs acicular, hyaline; pseudopetiole 2.6–7.4 mm long; blades 2.5–15 × 1–3.4 cm, lanceolate to ovate, straight, membranous to thinly chartaceous, adaxially green to dark green, abaxially light green to green, adaxially sparsely scabrid with prickle-hairs, sometimes also sparsely pilose along the midvein, hairs hyaline, abaxially scabrid with prickle-hairs and pilose along the midvein, hairs hyaline, base asymmetric, obtuse to round, margin flat, papillose, apex acuminate to long-acuminate; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins 3–4 pairs, adaxially conspicuous, abaxially inconspicuous, becoming conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence, restricted to the apex of the stems and forming a dense second-degree synflorescence. *Inflorescences* leaf-opposed, peduncle 0.9–4.1 cm long, ca the same length as or longer than ½ length of the spathe, pendulous, scabrid with a mixture of prickle- and hook-hairs, hairs hyaline; spathe 2.1–5.5 × 1.4–3.6 cm, cordate, continuous to the peduncle and pointing downwards, internally inconspicuously mucilaginous, base free, cordate, externally glabrous to sparsely scabrid with a mixture of prickle- and hook-hairs, apex acuminate, slightly falcate, veins 4–5 pairs, inconspicuous, becoming conspicuous when dry; upper cincinnus vestigial, flowerless, peduncle inconspicuous or up to 2.5 mm long, included, gently recurved at pre-anthesis and anthesis, recurved and exserted at post-anthesis and fruit, glabrous with some odd hook-hairs towards the apex, hairs hyaline; lower cincinnus 2–5-flowered, flowers mainly bisexual, rarely staminate, peduncle 1–1.8 cm long, thickened in fruit, sparsely puberulous with minute hook-hairs towards the apex. *Flowers* chasmogamous,

zygomorphic, enantiostylous (style dislocated to the opposite side to the medial stamen); floral buds 4.4–6.8 × 2.1–3.4 mm, obovoid, light green or white to light blue, glabrous; pedicel 3.7–7.3 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, sparsely puberulous with minute hook-hairs, hairs hyaline; sepals light green, opaque, early deciduous in fruit, dorsal sepal 3.5–6.2 × 1.8–2.5 mm, elliptic to narrowly triangular, concave, glabrous, apex acute, lower sepals 3.6–6.6 × 2.4–3.2 mm, sessile, free, ovate to widely ovate, concave, glabrous, apex acute; paired petals 0.8–1.7 × 0.5–1.5 cm, clawed, claw 2.4–4.6 mm long, light blue, limb 5.3–12.4 × 5.4–15.1 mm, widely reniform to widely rhombic-reniform, blue to sky blue, base asymmetric, hastate, apex obtuse, medial petal 4.6–8.5 × 4.1–7.9 mm, shortly-clawed, claw 0.6–1 mm long, light blue, limb 4.6–8.3 × 4.1–7.9 mm, widely sagittate, entire, concave to strongly concave, concolourous with the paired petals, opaque, glabrous on both sides, apex cuspidate; staminodes 2, medial staminode completely absent, filaments 4.1–5.8 mm long, straight to slightly sinuate, apex straight to decurved, sky blue, base sometimes light blue, antherodes 1.2–1.5 × 0.6–1.2 mm, V-shaped, white, minute pollen sacs between the upper and lower lobes absent, apiculate between the upper lobes, upper lobes absent, smaller than the lower, lower lobes filiform; lateral filaments 5.4–7.9 mm long, gently sigmoid, geniculate distal to the middle, apex gently recurved, light blue, apex sky blue, anthers 1.2–1.8 × 0.7–1 mm, near the medial anther, sagittate, yellow, connective white to cream-coloured, pollen pale yellow, drying yellow; medial filament 4.3–5.9 mm long, straight to arcuate-decurved, light blue, apex sky blue, anther 1.9–3.3 × 0.8–1.2 mm, held near the lateral anthers, sagittate, strongly curved, yellow, connective sagittate, white to cream-coloured, anther sacs appressed to each other, pollen pale yellow, drying yellow; ovary 1.5–2.7 × 1–1.9 mm, 3-carpellate, 5-ovulate, ellipsoid to widely ellipsoid, green, smooth, glabrous, style 0.8–1.1 cm long, twice as long as the stamens, gently sigmoid, base tapering into the ovary, apex straight to gently recurved, light blue, base light green, apex sky blue, persistent in fruit, stigma truncate, sky blue. *Capsules* 2–5 per spathe, 5.1–8.9 × 4.8–8.4 mm, widely ellipsoid to subglobose to globose, sessile, fruit wall thick, apex round to apiculate due to the persistent style base, not constricted between the seeds when mature, dark blue to bluish-black to black when mature, glaucous, smooth, 3-locular, indehiscent, dorsal locule 1-seeded, indehiscent, ventral locules 2-seeded, indehiscent. *Seeds* monomorphic, 2.7–4.5 × 2.5–4.1 mm, free from the capsule wall, triangular to triangular-ellipsoid, dorsally flattened, ventrally pyramidal, not cleft towards the embryotega, light brown to greyish-brown, testa foveolate, densely farinose, farinae cream-coloured, embryotega semilateral to lateral, inconspicuous, without a prominent apicule, hilum linear, ca the same length as the seed.

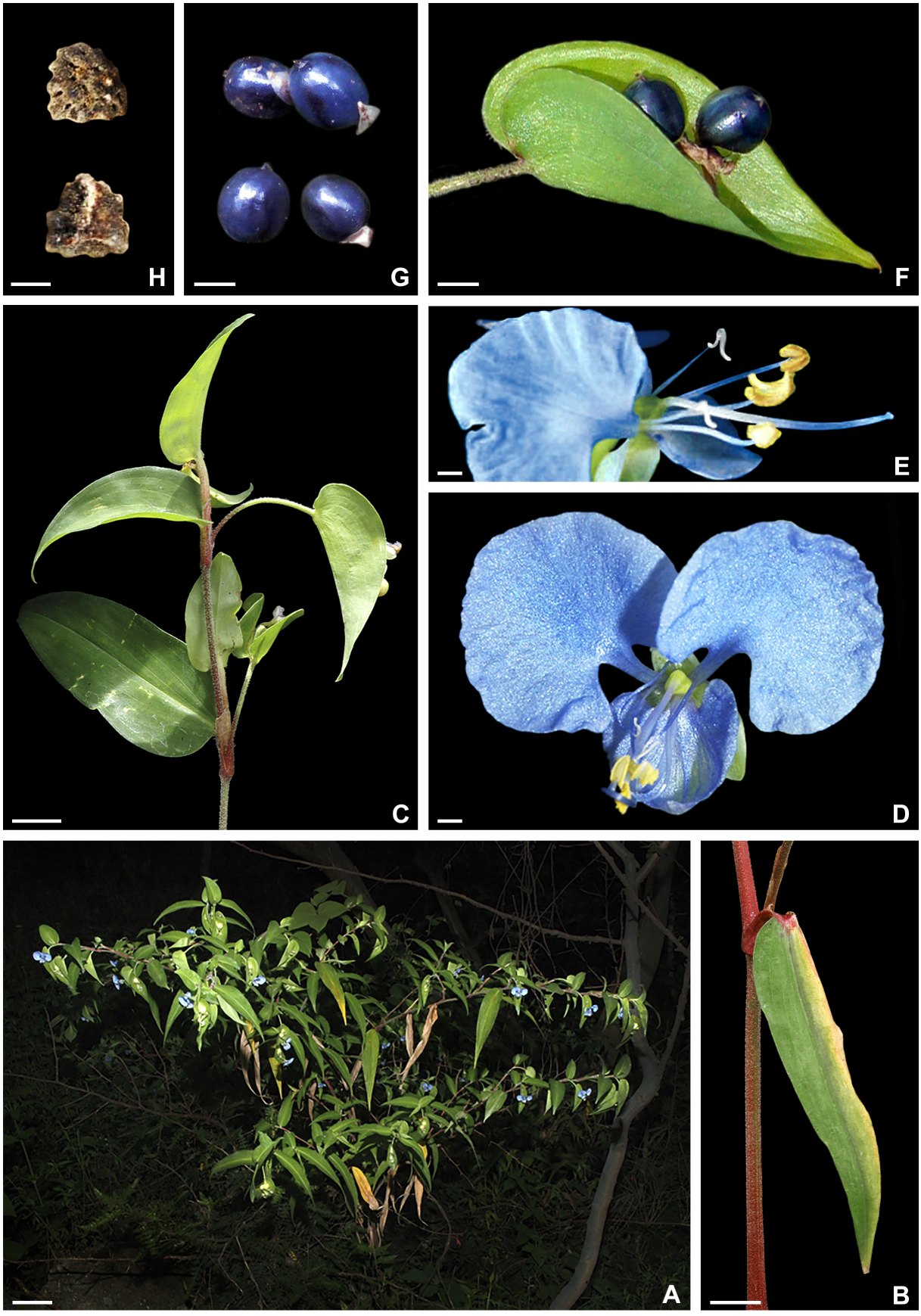
Distribution

Commelina leiocarpa ranges from Mexico to western Honduras (Fig. 6).

Ecology

It grows in the understory of dry forests and at the edges of rainforests in open environments.

Fig. 9 (next page). *Commelina leiocarpa* Benth. **A**. Habit. **B**. Detail of a primary branch showing stem, leaf-sheath and blade. **C**. Detail of a secondary branch showing leaves and inflorescences. **D–E**. Flower. **D**. Front view of a bisexual flower. **E**. Close-up of bisexual flower showing the androecium and gynoecium. **F**. Inflorescence bearing mature fruits. **G**. Mature fruits showing their bluish-black glaucous colouration. **H**. Dorsal and ventral sides of the seeds showing their foveolate testa. Photos: A–D by P. Tenorio Lezama (*H. Vibrans 7812*, MEXU); E by F. Cabrera Manuel (*F. Cabrera 840*, HUAA); F by E.J. López Patiño (iNataturalist 27526741, unvouchered); G by E. Guevara Lazcano (iNataturalist 9539159, unvouchered); and H by M.O.O. Pellegrini (lectotype, *A. Sinclair s.n.*, K [K000363260]). Scale bars: A = 5 cm; B = 1.5 cm; C = 1 cm; D = 2 mm; E, H = 1.5 mm; F–G = 5 mm.


H
G
F
C
E
D
A
B

Phenology

It was found in bloom and fruits from October to December.

Conservation

Commelina leiocarpa is widely distributed, with wide EOO (1 529 386 km^2) and AOO (ca 1704 km^2), and does not meet the thresholds for criterium B. There is no information on its populational trends or its current threats. Thus, following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations, we suggest *C. leiocarpa* should be considered as Least Concern (LC, criterium B).

Vernacular names

Chipil de piedra chicsé (Mexico), matalín (Mexico), hierba de pollo (El Salvador).

Remarks

Commelina leiocarpa has been, up until now, circumscribed in a much broader sense to include *C. efoveolata*. Despite their gross morphology similarities, especially regarding their vining habit and gem-like fruits, both species differ in distribution, stem, leaf-blade, spathe and sepal pubescence, petal colouration, antherodes morphology and colouration, and seed morphology (Table 2). Furthermore, *C. leiocarpa* is superficially similar to *C. almandina* sp. nov., *C. pallida* and *C. texcocana* due to inflorescence architecture and floral morphology. Nonetheless, *C. leiocarpa* can be differentiated from all three species by its peduncle pendulous (vs straight), spathe slightly falcate with base cordate (vs straight, subcordate to round), pedicel with hook-hairs (vs acicular hairs), style twice as long as the stamens (vs slightly longer than the stamens), stigma sky-blue (vs white), fruits indehiscent, glaucous, not constricted between the seeds, apex round (vs dehiscent, 3-valved, opaque, constricted between the seeds when mature, rostrate), style persistent (vs deciduous), and seeds monomorphic, triangular and ventrally pyramidal (vs dimorphic, ellipsoid and ventrally flattened) (Table 2).

Despite being described as a variety of *C. efoveolata*, *Phaeosphaerion efoveolatum* var. *repens* can be unambiguously confirmed to be conspecific with *C. leiocarpa*. The holotype shows the typical vegetative and reproductive morphology for the species, with membranous and wide leaf-blades, sky blue flowers with the medial petal cuspidate at apex, antherodes V-shaped and white, lateral and medial anthers pale yellow, fruits dark blue, and seeds distinctively foveolate. Thus, it is kept by us as a synonym of *C. leiocarpa*.

Commelina obliqua Vahl

Figs 10–11; Table 3

Commelina obliqua Vahl (Vahl 1806: 172). – *Commelina erecta* var. *obliqua* (Vahl) C.B.Clarke (Clarke 1881: 181).

Commelinopsis glabrata D.R.Hunt (Hunt 1981: 195). – *Commelina rufipes* var. *glabrata* (D.R.Hunt) Faden & D.R.Hunt (Faden & Hunt 1987: 122). – **Type:** TRINIDAD AND TOBAGO – **Trinidad** • Irois Forest district under cacao trees in quantities; 25 Jan. 1928; fl., fr.; *W.E. Broadway 6716*; holotype: K [K000363259]!; isotype: BM [BM000938214]!. **Syn**. **nov**.

Tradescantia portoricensis Bello (Bello 1883: 122). – **Type:** PUERTO RICO • Dorado forest; 28 Mar. 1966; fl., fr.; *R.O. Woodbury s.n.*; neotype: UPR [UPR no. 06057]!, designated by Santiago-Valentín *et al.* (2015). **Syn**. **nov**.

Etymology

From the Latin '*oblīqua*' (meaning 'slanting, awry, oblique'), in reference to its oblique and asymmetrical leaf-blade base.

Type material

COUNTRY UNKNOWN • s.loc., cultivated in France, ex Horto Celsii; s.dat.; fl.; *Ventenat s.n.*; lectotype: C [C10009563]!, designated by Hunt (1994).

Selected material examined

North America

MEXICO – **Oaxaca** • Itsmo de Tehuantepec, Juchitán de Zaragoza, La Ventosa; 16 May 2014; fl.; *F. Sánchez L. & P. Trujillo V. 815*; MEXU, US.

West Indies

CUBA – **Oriente** • Sierra de Cristal, banks of Lebisa River; 27 Dec. 1955; fl.; *A.H. Liogier & M. López Figueiras 4618*; MO, US.

DOMINICAN REPUBLIC – **Samaná** • La Vaca, N of Los Cacaos, Samaná Peninsula; 15 Mar. 1969; fl., fr.; *A.H. Liogier 14417*; MO, US.

GRENADA – **Saint George** • Mt. Gilbert, NE of Mt. Maitland; 4–10 Mar. 1979; fl., fr.; *R.A. Howard & E.S. Howard 18794*; NY.

PUERTO RICO – **Utuado** • Bo. Don Alonzo; 9 Jan. 1999; fl.; *P. Acevedo-Rodríguez 10534*; JBSD, MAPR, NY, UPRRP, US.

TRINIDAD AND TOBAGO – **Trinidad** • St. George, Mount Tucuche; 9 Mar. 2006; fl., fr.; *P.J.M. Maas et al. 9745*; U, US.

Central America

BELIZE – **Belize** • Bermudian Landing, Belize River; 25 May 1981; fr.; *C. Whitefoord 3031*; BM, MO, NO.

COSTA RICA – **Limón** • Canton de Talamanca, Fila Carbon, W of Cahuita; 13 Feb. 1991; fl.; *P.J.M. Maas 7905*; MO, U, US.

EL SALVADOR – **Ahuachapán** • Sierra de Apaneca, in the region of Finca Colima; 17–19 Jan. 1922; fr.; *P.C. Standley 20203*; F, US.

GUATEMALA – **Huehuetenango** • forested slopes in the vicinity of Ixcan, Sierra de los Cuchmantanes; 27 Jul. 1942; fl.; *J.A. Steyermark 49432*; F.

HONDURAS – **Cortés** • Near Agua Azul; 27 Dec. 1947; fr.; *L.O. Williams & A. Molina R. 11353*; US.

NICARAGUA – **Granada** • Volcán Mombacho, Hacienda Las Delicias, ca 10 km al SE de ciudad Granada; 11 Oct. 1983; fr.; S. *Vega & A. Grijalva 36*; MO, US.

PANAMA – **Panamá** • Near Fort Randolph, Canal Zone; 28 Dec 1923; fl.; *P.C. Standley 28649*; F, US.

South America

BOLIVIA – **Beni** • Yacuma, Estacion Biologica Beni Entrada El Triunfo; 4 Jun. 1988; fl.; *E. Villanueva & R. Foster 761*; LPB, US.

BRAZIL – **Bahia** • Ilhéus, ca 22 Km na estrada Ilhéus/Serra Grande; 10 Aug. 1994; fl., fr.; *A.M.V. de Carvalho et al. 4573*; CEPEC, HUEFS, NY, RB.

COLOMBIA – **Meta** • 20 km SE of Villa Vicencia; 17 Mar. 1939; fr.; *A.H. Alston 7575*; BM, US.

ECUADOR – **Guayas** • Balao, in silvis gregaris; Dec. 1891; fl.; *H.F.A. von Eggers 14141*; L, US.

FRENCH GUIANA – **Maripasoula** • Mont Galbao, secteur Est., Crète Nord-Sud; 14 Jan. 1986; fr.; *J.J. Granville et al. 8687*; BR, CAY, MG, MO, NY, P, U, US.

GUYANA – **East Berbice-Corentyne** • Corentyne River; Sep. 1879; fl.; *E.F. Thurn s.n.*; P [P01795525, P01795526].

PERU – **San Martín** • Mariscal Cáceres, Dtto. Tocache Nuevo, Quebrada Ishichimi, cerca al Fundo del Sr. Luis Ludeña; 9 Nov. 1980; fl., fr.; *J. Schunke-Vigo 12409*; RB, US 2ex.

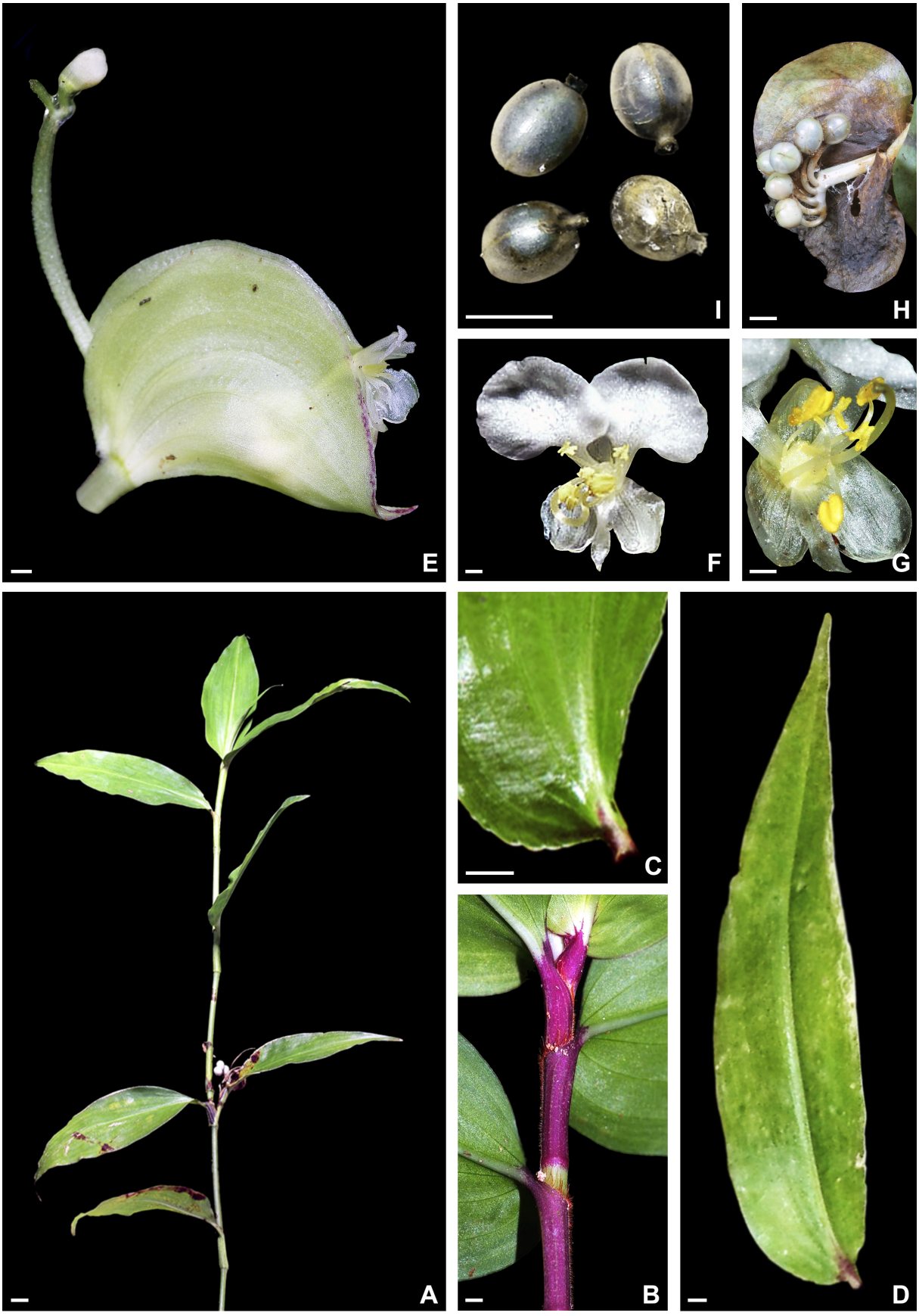
SURINAME – **Sipaliwini** • Large island in Litani River, 6 km upstream from its confluence with Marowini River to form Lawa River; 1 Apr. 1998; fl., fr.; *B. Hammel et al. 21225*; MO, U 2ex.

VENEZUELA – **Delta Amacuro** • Mountain area ca 13 km by road ESE of the town of Sierra Imata; 4–6 Apr. 1979; fr.; *G. Davidse & A.C. González 16612*; MO, US, VEN.

Description

Herbs 30–120 cm tall, ascending to scrambling, perennial, robust, terrestrial or paludal. *Roots* fibrous, thin. *Rhizome* short. *Stems* monomorphic, ascending, branched; internodes 0.6–5.8 cm long, distally shorter, green, glabrous, sometimes with a line of acicular hairs opposite to the leaves, hairs hyaline or rusty to rusty-brown. *Leaves* distichously-alternate, evenly distributed along the stem, pseudopetiolate; sheaths 0.3–2.6 cm long, light green, generally suffused or speckled or longitudinally striated with magenta to red to vinaceous, sometimes completely magenta to red to vinaceous, glabrous, sometimes with a sparse setose line of hairs opposite to the leaves, hairs acicular, light brown to rusty, margin upright, glabrous to sparsely setose, hairs acicular, light brown to rusty; pseudopetiole 1.2–4.6 mm long; blades (1.3–1.9–)4.5–19.4 × (0.5–0.7–)1.3–5 cm, lanceolate to ovate, sometimes elliptic, straight, thinly chartaceous to chartaceous, adaxially dark green to green, abaxially light green, adaxially glabrous to scabrid with prickle-hairs, abaxially glabrous, base asymmetric to strongly asymmetric, one side cuneate the other round, margin slightly revolute, glabrous to scabrid with prickle-hairs, apex acuminate to long-acuminate; midvein conspicuous, adaxially canaliculate, abaxially prominently obtuse, secondary veins 2–3 pairs, adaxially conspicuous, abaxially conspicuous, becoming more conspicuous on both sides when dry. *Synflorescence*

Fig. 10 (next page). *Commelina obliqua* Vahl. **A**. Habit. **B**. Leaf-sheaths. **C**. Pseudopetiole. **D**. Leaf-blade. **E**. Inflorescence showing its pale colouration and vinaceous margin near apex. **F–G**. Flower. **F**. Front view of a bisexual flower showing the constricted medial petal. **G**. Close-up of a bisexual flower showing the androecium and gynoecium. **H**. Marcescent spathe split open to show the pearl-like mature fruits. **I**. Mature fruits showing their shape, stipe and colouration. Photos: A, H by J. Amith (*P. Acevedo-Rodríguez 15962*, US); B, E by H. Galliffet (unvouchered); C, F by Flora Virtual Estación Biológica El Verde (unvouchered); D, I by A. Popovkin (*A.V. Popovkin 2047*, HUEFS); and G by J.L. Clark (*J.L. Clark et al. 11590*, BRIT). Scale bars: A = 1 cm; B–D = 3 mm; E–G = 1 mm; H–I = 5 mm.


E
I
H
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B

composed of a solitary main florescence, restricted to the apex of the stems. *Inflorescences* terminal or apparently so, peduncle 0.2–1 cm long, shorter than ½ length of the spathe, straight, glabrous to puberulous with hook-hairs, sometimes with a line of acicular hairs opposite to the spathe, hairs hyaline; spathe 1.9–4.5 × 2.4–4.8 cm, very widely ovate to depressed ovate, patent to the peduncle, pale greenish-white to greenish-white to pale greenish-yellow, sometimes margin magenta to vinaceous, internally conspicuously mucilaginous, base only basally connate, splitting open and marcescent in fruit, subcordate, externally glabrous to ciliate with hook-hairs, hairs hyaline, margin flat, apex acuminate, slightly falcate, veins 5–6 pairs, conspicuous, becoming more conspicuous when dry; upper cincinnus developed, 2–6-flowered, flowers mainly staminate, rarely bisexual, peduncle 1.1–2.3 cm long, exserted, decurved at pre-anthesis and anthesis, sometimes strongly decurved to J-shaped at post-anthesis and fruit, sparsely to densely puberulous with minute hook-hairs, hairs hyaline; lower cincinnus 6–10-flowered, flowers mainly bisexual, sometimes staminate, peduncle 0.6–1.4 cm long, thickened in fruit, glabrous to sparsely puberulous with minute hook-hairs. *Flowers* chasmogamous, strongly zygomorphic, enantiostylous (style dislocated to the opposite side to the medial stamen); floral buds 1.9–6.3 × 2.3–7.1 mm, obovoid, light green to pale greenish-yellow to white, glabrous; pedicel 2.1–4.5 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green to pale greenish-yellow, sparsely puberulous to puberulous with minute hook-hairs, hairs hyaline; sepals hyaline, early deciduous in fruit, dorsal sepal 4.3–5.2 × 2.4–3.5 mm, elliptic, concave, glabrous, apex acute, lower sepals 5.3–6.7 × 2.7–4.9 mm, shortly-clawed, connate up to mid-length, oblique-obovate, concave, glabrous, apex obtuse to round; paired petals 1–1.3 × 0.8–1 cm, clawed, claw 4.5–5.6 mm long, white, limb 5.4–6.9 × 7.9–9.6 mm, widely rhombic-reniform to reniform, white, base asymmetric, cordate, apex obtuse to slightly emarginate, medial petal 5.9–7.1 × 0.7–1.2 mm, sessile, lanceolate, entire, margin revolute at mid-length forming a medial constriction, concolourous with the paired petals, opaque, glabrous on both sides, apex acute to acuminate; staminodes (2–)3, medial staminode equal to the laterals, rarely medial staminode completely absent or greatly reduced and lacking the antherode, filaments 3.7–4.8 mm long, straight to arcuate-decurved, white, base sometimes pale greenish-yellow, antherodes 1.2–2.7 × 0.5–1.4 mm, narrowly hastate, pale yellow, minute pollen sacs between the upper and lower lobes present, non-polliniferous or producing very few grains, not apiculate between the upper lobes, upper lobes conspicuous, oblong, smaller than the lower, lower lobes oblanceolate; lateral filaments 5.9–8.2 mm long, very gently sigmoid to gently sigmoid, geniculate distal to the middle, apex recurved, white, base sometimes pale greenish-yellow, anthers 1.4–3 × 0.7–1.6 mm, held near the antherodes, elliptic to ovate, yellow, connective pale yellow to yellow, pollen pale yellow, drying yellow; medial filament 3.7–5.1 mm long, arcuate-decurved to gently sigmoid, apex recurved to strongly recurved, white, base sometimes pale greenish-yellow, anther 2.4–3.8 × 1.5–2.2 mm, held near the medial petal, widely sagittate, straight to slightly curved, pale yellow to yellow, connective saddle-shaped, pale yellow to yellow, anther sacs not appressed to each other, pollen pale yellow to yellow, drying yellow; ovary 1.2–1.4 × 1–1.3 mm, 3-carpellate, 5-ovulate, ellipsoid to widely ellipsoid, white to pale greenish-yellow, smooth, densely puberulous with glandular microhairs, style 5.3–7.1 mm long, exceeding the stamens, gently sigmoid to sigmoid, base cylindric, apex strongly recurved, white, base sometimes pale greenish-yellow, deciduous in fruit, stigma truncate, white. *Capsules* 6–9 per spathe, 5.3–7.1 × 4.2–5.8 mm, widely ellipsoid to widely oblongoid, short-stipitate, stipe 0.3–0.9 mm long, fruit wall thin, crustaceous, apex round, generally apiculate due to the persistent style base, not constricted between the seeds, pearly-white to silvery when mature, shiny, smooth, 3-locular, indehiscent, dorsal locule 1-seeded, ventral locules 2-seeded. *Seeds* monomorphic, 2.6–4.3 × 1.9–3 mm, the dorsal seed slightly larger than the ventral ones, all seeds adnate to the fruit wall and septa forming a dispersal unit, ellipsoid to triangular-ellipsoid, dorsally slightly flattened, ventrally pyramidal, not cleft towards the embryotega, dark grey to black, testa inconspicuously foveolate, non-farinose, embryotega lateral, inconspicuous, with a prominent apicule, hilum linear, longer than ½ the length of the seed.

Distribution

Commelina obliqua is widely distributed, extending from Mexico and the West Indies to Bolivia and Northeastern and Central-Western Brazil (Fig. 11). The specimens cited by Pellegrini & Forzza (2017) for Southeastern Brazil (State of Rio de Janeiro) actually represent *C. scabrata* and, thus, are excluded from this species' distribution range.

Fig. 11. Distribution map for *Commelina obliqua* Vahl and *C. pseudomonosperma* (Kuntze) L.M.Camp. Green = Tropical and Subtropical Moist Broadleaf Forests; Pale Yellow = Tropical and Subtropical Dry Broadleaf Forests; Brown = Tropical and Subtropical Coniferous Forests; Tea Green = Temperate Broadleaf and Mixed Forests; Army Green = Temperate Coniferous Forest; Orange = Tropical and Subtropical Grasslands, Savannas and Shrublands; Beige = Temperate Grasslands, Savannas and Shrublands; Lilac = Flooded Grasslands and Savannas; Pink = Montane Grasslands and Shrublands; Olive Green = Mediterranean Forests, Woodlands and Scrubs; Red = Deserts and Xeric Shrublands; Teal = Mangroves and Coastal Environments.

Ecology

It is found growing in the understory of rainforests and seasonally dry forests.

Phenology

It was found in bloom from March to December and with fruits from November to April.

Vernacular names

Trapoeraba branca (Brazil), manobi-morotí (Brazil), andacá-morotí (Brazil), Anda ka'a morotî (Brazil – Guarani), zapupa (El Salvador).

Conservation

Commelina obliqua presents wide EOO (19 023 054 km^2) and AOO (ca 3624 km^2) and does not meet the thresholds for criterium B. There is no information on its populational trends or its current threats. Thus, following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations, we suggest it should be considered as Least Concern (LC, criterium B).

Nomenclatural remarks

The name *Commelina obliqua* has, up until now, been erroneously applied to the blue-flowered species correctly named *C. robusta*. This confusion is rooted in Hunt (1981, 1983), which was posteriorly reinforced by Faden & Hunt (1987) and has survived up to now. Faden & Hunt (1987) reduced the genera *Athyrocarpus*, *Commelinopsis* and *Phaeosphaerion* to synonyms of *Commelina* based on the difficulty of differentiating these genera in the absence of fruiting material. Despite this being true and the gem-fruited species having evolved independently many times in *Commelina* (Pellegrini *et al.* in prep.), the gem-fruited species can be differentiated from closely related species based on vegetative, inflorescence and floral characters (see identification key). For instance, *C. obliqua* can be differentiated from *C. robusta* based on its pseudopetiolate leaves (vs sessile in *C. robusta*), leaf-blade margin slightly revolute (vs flat), apex acuminate to long-acuminate (vs obtuse to acute), spathe slightly falcate (vs straight), only basally connate and subcordate (vs connate on the basal half to almost completely connate and truncate), much lighter than the leaves in vivo (vs the same colour as the leaves), the fused base splitting open in fruit (vs remaining fused), petals white (vs light blue to blue to sky blue or pale lilac to lilac), medial staminode aborted (vs present), and stigma trilobate (vs truncate).

Regarding fruit and seed morphology, *C. robusta* can be differentiated from *C. obliqua* based on its fruits being sessile, dehiscent, constricted between the seeds and tan-coloured or off-white when mature (vs short-stipitate, indehiscent, not constricted between the seeds, crustaceous and pearly-white to silvery when mature in *C. obliqua*), seeds dimorphic, ellipsoid, ventrally flattened, not adnate to the fruit wall and septa and each dispersed individually (vs monomorphic, triangular, ventrally pyramidal, all adnate to the fruit wall and septa and forming a dispersal unit), and testa ornate (vs inconspicuously foveolate). While analysing the type specimen of *C. obliqua*, it became clear that it possesses pseudopetiolate leaves, leaf-blades with slightly revolute margins and long-acuminate apex, spathe slightly falcate, only basally connate with a subcordate base, petals white, and medial staminode aborted. Based on the aforementioned vegetative, inflorescence and floral characters, it was possible to confirm the type specimen of *C. obliqua* to be conspecific with the plants currently treated under *C. rufipes* var. *glabrata*. Thus, as the oldest validly published name at the species rank, *C. obliqua* is the correct name for the glabrous-leafed, white-flowered, white-fruited species of Neotropical *Commelina*.

Remarks

Commelina obliqua is morphologically most similar to *C. pseudomonosperma* and *C. rufipes* due to their leaf-blade margin being slightly revolute, spathe only basally connate, much lighter than the leaves

Table 3. Diagnostic field characters for the gem-fruited species of the *Commelina benghalensis* group.

Characters	*Commelina obliqua*	*Commelina pseudomonosperma*	*Commelina rufipes*
Growth form	Ascending to scrambling	Prostrate to scrambling	Prostrate to ascending
Leaf-sheath margin	Glabrous to sparsely setose, hairs light brown to rusty	Glabrous to setose, hairs light brown to rusty	Hirsute, hairs rusty to rusty-brown
Spathe	Pale greenish-white to greenish-white, sometimes margin fuchsia to vinaceous near the apex, externally glabrous to ciliate with hook-hairs, hairs hyaline, margin flat, apex acuminate, slightly falcate	Pale greenish-yellow to yellowish-green, generally suffused with fuchsia to vinaceous along the margin, externally glabrous, rarely with occasional hook-hairs, hairs hyaline, margin repandous, apex acuminate, slightly falcate	Light green, base only basally connate, splitting open in fruit, truncate to subcordate, externally minutely villous with eventual cilia, hairs hyaline, cilia rusty to rusty-brown, margin flat, apex acute, straight
Pedicel	Sparsely puberulous to puberulous with minute hook-hairs	Sparsely puberulous with minute hook-hairs	Puberulous with minute hook-hairs
Paired petal limb	Widely rhombic-reniform to reniform, white, base cordate	Widely rhombic-reniform to reniform, pale lavender to light pink, base cordate,	Rhombic to rotund, white, base round to subtruncate
Medial petal	Lanceolate, margin revolute at mid-length, forming a medial constriction, white, apex acute	Spathulate to oblanceolate, cucullate, pale lavender to light pink, apex round	Elliptic to narrowly oblanceolate, flat, white, apex obtuse
Antherodes	Narrowly hastate, minute pollen sacs between the upper and lower lobes present, upper lobes conspicuous, oblong, smaller than the lower, lower lobes oblanceolate	Subtrapezoid, minute pollen sacs between the upper and lower lobes absent, upper lobes reduced, smaller than the lower, lower lobes reduced	Cordate, minute pollen sacs between the upper and lower lobes absent, upper lobes absent, lower lobes obovoid
Lateral anthers	Elliptic to ovate	Subcordate to cordate	Subcordate
Medial anther	Widely sagittate, connective saddle-shaped, pale yellow	Widely sagittate, connective saddle-shaped, pale yellow	Widely oblong to widely elliptic, connective oblong, yellow
Capsules	6–9 per spathe, widely ellipsoid to widely oblongoid	2–4 per spathe, widely obovoid	2–4 per spathe, subglobose to globose

in vivo, the fused base splitting open in fruit, pedicels sparsely puberulous to puberulous with minute hook-hairs, medial staminode aborted, style persistent in fruit, stigma truncate, fruits short-stipitate, indehiscent, not constricted between the seeds, crustaceous, pearly-white to silvery when mature; seeds monomorphic, triangular, ventrally pyramidal, all adnate to the fruit wall and septa and forming a dispersal unit, testa smooth (Table 3). Recently, *C. obliqua* has erroneously been reduced to a synonym of *C. rufipes* based on their leaf-sheaths with rusty setose marginal hairs, white flowers, and indehiscent white fruits (Hassemer 2020). However, *C. obliqua* is readily differentiated from *C. rufipes* by its leaf-sheaths glabrous, margin glabrous to setose, hairs light brown to rusty (vs hirsute throughout, hairs rusty to rusty-brown in *C. rufipes*), blades lanceolate to ovate, sometimes elliptic, lustrous, thinly chartaceous to chartaceous (vs lanceolate to elliptic-lanceolate, opaque, membranous), adaxially glabrous to scabrid with prickle-hairs and abaxially glabrous (vs hispid on both sides, hairs hyaline, sparsely hirsute along the midvein and near the base, hairs rusty to rusty-brown), base asymmetric to strongly asymmetric, one side cuneate the other round (vs symmetric, cuneate to obtuse), apex acuminate to long-acuminate (vs acute), spathe very widely ovate to depressed ovate, glabrous, rarely with occasional hook-hairs (vs ovate to widely ovate, hispid with hyaline acicular hairs, sometimes with some rusty hirsute hairs), and medial petal lanceolate (vs very narrowly elliptic to narrowly elliptic) (Table 3). Therefore, *C. obliqua* is reestablished by us as an accepted species based on consistent morphological characters. Furthermore, if the species in this complex were to be treated as conspecific, the name *C. obliqua* would take precedence over *C. rufipes* by around 50 years, requiring it to become the accepted name for these taxa.

Commelina pallida Humb. & Bonpl. ex Willd.

Figs 2, 12; Table 1

Commelina pallida Humb. & Bonpl. ex Willd. (Willdenow 1809: pl. 87); Schlechtendal (1855: 454). – *Athyrocarpus pallidus* (Humb. & Bonpl. ex Willd.) B.D.Jacks. (Jackson 1893: 244).

Aclisia florida Kunth (Kunth 1843: 47), pro syn. **Syn**. **nov**.

Etymology

From the Latin '*palleō*' (meaning 'pale, losing colour') + the suffix '*-ida*' (meaning 'tending to'), in reference to its pale lilac to lilac flowers.

Type material

MEXICO – **Querétaro** • originally collected at the mountainous plateaus between Queretaro and San Juan del Rio, cultivated at the Berlin Botanic Garden; s.dat.; fl., fr.; *A.J.A. Bonpland & F.W.H.A. von Humboldt s.n.*; lectotype: B [B-W01051-010]!, pro parte, material on the left, **designated here**; isolectotype: P [P00669531]!.

Selected material examined

MEXICO – **México** • Villa de Guadalupe, Bilimek; 17 Aug. 1869; fl.; *E. Cosson 437*; P 2ex. – **Morelos** • wet barranca above Cuernavaca; 21 Sep. 1896; fl.; *C.G. Pringle 6567*; E [E01026662], pro parte, specimen on the right, P [P01741878] pro parte, specimen on the left. – **Puebla** • vicinity of Puebla; 15 Aug. 1906; fl.; *G. Arsène s.n.*; US [US00158908]. – **Querétaro** • cerca de El Carmen, 11 km al E de Querétaro, sobre el camino a San Juan del Río; 16 Aug. 1986; fl.; *J. Rzedowski 40344*; MEXU.

Description

Herbs 50–100 cm tall, scrambling, perennial, robust, terrestrial. *Roots* tuberous, cylindric, with apical fusiform tubers. *Rhizome* short. *Stems* dimorphic, branched in the upper third; internodes 1.8–6.2 cm long,

distally shorter, green suffused with red to completely red, sparsely strigose to strigose, with a sparse line of acicular hairs opposite to the leaves, hairs hyaline, drying light brown to golden, primary branches ascending, rooting only at the base, secondary branches longer than the primary branches, scrambling, apex suberect to erect. *Leaves* distichously-alternate, evenly distributed along the upper part of the stem, pseudopetiolate; sheaths 1.2–2.8 cm long, red suffused with light green to completely red, strigose, hairs acicular, hyaline, with a sparse line of setose hairs opposite to the blade, hairs acicular, drying light brown to golden, margin upright, ciliate, hairs acicular, drying light brown to golden; pseudopetiole inconspicuous to up to 6.9 mm long; blades (1.3–)1.7–9.4 × 0.6–4.2 cm, elliptic to lanceolate, straight, membranous to thinly chartaceous, adaxially dark green, generally suffused with red to vinaceous near base and along the veins, margin vinaceous, abaxially light green, adaxially sparsely strigose, hairs acicular, drying light brown to golden, abaxially strigose, hairs acicular, drying light brown to golden, base slightly asymmetric to symmetric, obtuse to round, margin flat, scabrid with prickle-hairs, apex acute to acuminate; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins 2–4 pairs, adaxially conspicuous, abaxially inconspicuous, becoming conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence, restricted to the apex of the stems and forming a dense second-degree synflorescence. *Inflorescences* leaf-opposed, peduncle 1.5–2.6 cm long, the same length or longer than ½ length of the spathe, straight, strigose to densely strigose, hairs acicular, with a line of minute hook-hairs opposed to the spathe, hairs hyaline, drying light brown to golden; spathe 2.3–3.1 × 1.8–2.7 cm, cordate, oblique to the peduncle and pointing downwards or continuous to the peduncle and pointing upwards, concolourous with the leaves, margin sometimes suffused with vinaceous to red, internally inconspicuously mucilaginous, base free, subcordate to round, externally sparsely strigose to strigose, hairs hyaline, drying light brown to golden, margin flat, apex acute, straight, veins 3–4 pairs, inconspicuous, becoming conspicuous when dry; upper cincinnus vestigial, flowerless, peduncle inconspicuous to up to 5.6 mm long, included, gently recurved at pre-anthesis and anthesis, recurved and exserted at post-anthesis and fruit, sparsely puberulous with hook-hairs towards the apex, hairs hyaline; lower cincinnus 2–4-flowered, flowers mainly bisexual, rarely staminate, peduncle 6.8–10.3 mm long, thickened in fruit, sparsely puberulous with minute hook-hairs towards the apex. *Flowers* chasmogamous, zygomorphic, enantiostylous (style gently dislocated to the opposite side to the medial stamen); floral buds 3.6–7.5 × 3.2–5.8 mm, obovoid, light green or white to pale lilac, glabrous to dorsally sparsely puberulous, hairs hyaline; pedicel 4.7–7.2 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, pilose with a mixture of acicular and hook-hairs, hairs hyaline; sepals light green, opaque, persistent and accrescent in fruit, dorsal sepal 4.7–5.6 × 1.2–1.8 mm, ovate, concave, glabrous to sparsely puberulous along the midvein, when present hairs acicular, short, hyaline, apex acute, lower sepals 5.2–6.4 × 2–3.2 mm, sessile, free, ovate, concave, glabrous, apex obtuse; paired petals 0.9–1 × 0.6–0.9 cm, clawed, claw 3.6–5.3 mm long, purple to mauve-purple, limb 6.7–7.6 × 6.1–8.9 mm, very widely reniform, pale lilac to lilac, base asymmetric, truncate, apex obtuse, medial petal 6.4–7.2 × 3.9–4.8 mm, shortly-clawed, claw 0.8–1.5 mm long, pale lilac to lilac, limb 4.3–5.8 × 2.8–3.9 mm, widely sagittate, entire, concave, concolourous with the paired petals, opaque, glabrous on both sides, apex obtuse to round; staminodes 2(–3), medial staminode completely absent or filament present but lacking the antherode, filaments 2.4–3.1 mm long, straight to arcuate-decurved, pale mauve to mauve-purple, base mauve to mauve-purple, apex purple, antherodes 0.5–0.6 × 0.7–0.9 mm, V-shaped, white, minute pollen sacs between the upper and lower lobes present, apiculate between the upper lobes, upper lobes absent to almost so, smaller than the lower, lower lobes spathulate to clavate; lateral filaments 7.4–8.9 mm long, gently sigmoid, apex recurved, geniculate distal to the middle, pale mauve to mauve-purple, base mauve to mauve-purple, apex purple, anthers 1.2–1.6 × 0.3–0.6 mm, held near the antherodes and medial anther, lanceolate-sagittate to sagittate, pale yellow to yellow, connective white to cream-coloured, pollen yellow, drying ochre; medial filament 6–7.3 mm long, arcuate-recurved, apex strongly recurved, pale mauve to mauve-purple, base mauve to mauve-purple, apex purple, anther 1.7–2.2 × 0.4–0.7 mm, held near the lateral anthers, linear sagittate to narrowly sagittate, strongly curved, pale yellow to yellow, connective hastate, white to cream-coloured, anther sacs appressed to each other, pollen yellow, drying ochre; ovary

1.9–2.7 × 1–1.5 mm, 3-carpellate, 5-ovulate, ellipsoid to widely ellipsoid, green, verrucose, glabrous, style 6.6–9.3 mm long, equalling or exceeding the stamens, sigmoid, base tapering into the ovary, apex strongly recurved, pale mauve to mauve-purple, base mauve to mauve-purple, apex purple, deciduous in fruit, stigma capitate, yellow. *Capsules* 1–2 per spathe, 5.9–7.6 × 3.7–4.6 mm, widely ellipsoid to oblongoid, sessile, fruit wall thick, apex rostrate, not constricted between the seeds when imature, becoming constricted between the seeds when mature, tan-coloured when mature, opaque, smooth, 3-locular, 3-valved, valves splitting to base, dorsal locule 1-seeded, dehiscent, ventral locules 2-seeded, dehiscent. *Seeds* dimorphic, dark brown to black; dorsal locule seed 3–3.4 × 2.2–2.5 mm, free from the fruit wall, ellipsoid, dorsiventrally compressed, ventrally flattened, slightly cleft towards the embryotega, testa shallowly rugose, with some small furrows on the side opposed to the embryotega, densely farinose, farinae cream-coloured, embryotega semilateral, inconspicuous, with a prominent apicule, hilum linear, longer than ½ the length of the seed; ventral locule seeds 2.2–2.5 × 2.1–2.3 mm, free from the fruit wall, widely ellipsoid, truncate at one end, ventrally flattened, not cleft towards the embryotega, testa shallowly rugose to irregularly rugose, densely farinose, farinae cream-coloured, embryotega semilateral to lateral, inconspicuous, with a prominent apicule, hilum linear, ca ½ the length of the seed.

Distribution

Commelina pallida is restricted to Valle de México and is confirmed to occur in the States of México, Morelos, Puebla, and Querétaro (Fig. 2). Specimens previously identified as *C. pallida* or *C. texcocana* outside Mexico (e.g., Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica) are the result of taxonomic confusion and represent a myriad of other species, including several members of both the *C. diffusa* and *C. tuberosa* groups and are, thus, excluded from the morphological characterisation and geographic distribution of *C. pallida*.

Ecology

It grows in high-altitude, seasonally dry forests and savannah-like formations, generally between bushes.

Phenology

It was found in bloom and fruits from August to November.

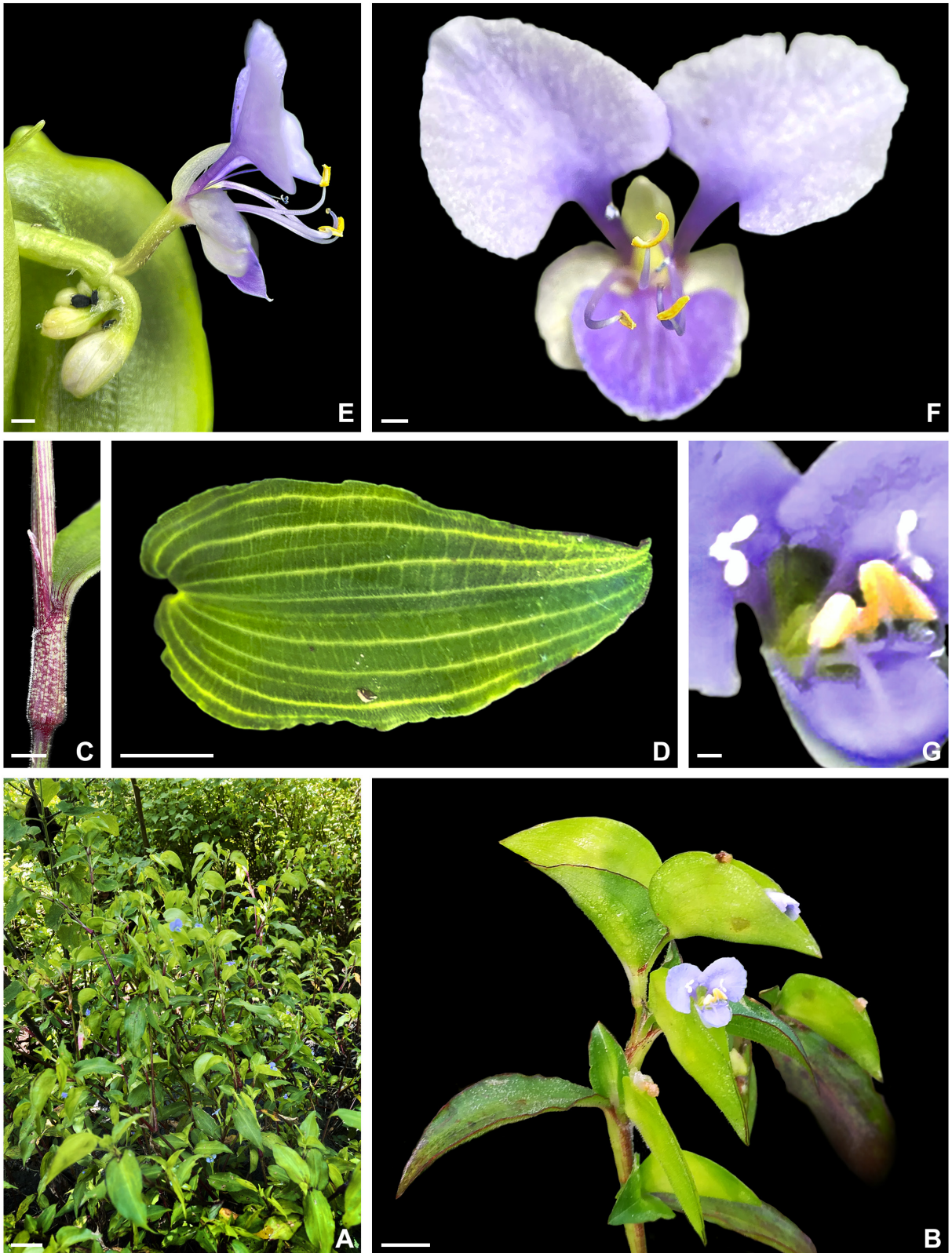
Vernacular name

Hierba del pollo (Mexico).

Conservation

Commelina pallida has a wide EOO (18 824 km^2) but a much narrower AOO (ca 256 km^2). The few known records were mainly collected before 1990, with a handful of records made after 2000. However, photographic records (iNaturalist 240395505, 239622550, 186796637, 186561037, 185768278, 184637360, 136088288, 135211974, 131518107, 130988364, 129549903, 94530608, 60203726, 17634962) confirm that the species is still extant. No information on its populational trends or its current threats is available. Thus, following the IUCN (2012) criteria and the IUCN Standards and Petitions

Fig. 12 (next page). *Commelina pallida* Humb. & Bonpl. ex Willd. **A**. Habit. **B**. Secondary branch showing several inflorescences. **C**. Stem and leaf-sheath. **D**. Leaf-blade with yellow veins caused by a viridivirus infection. **E**. Inflorescence with spathe opened to show the aborted upper cincinnus, the cincinni and the pedicel pubescence. **F–G**. Flower. **F**. Front view of a bisexual flower. **G**. Close-up of a staminate flower showing the androecium. Photos: A, C, E–F by J.L. Vigosa Mercado (unvouchered); B by C.G. Velazco-Macias (iNaturalist 17634962, unvouchered); D, G by D. Samuel Figueroa (unvouchered). Scale bars: A = 3 cm, B = 1 cm; C–D = 5 mm; E–F = 1 mm; G = 0.5 mm.


E
F
C
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A
B

Committee (2024) recommendations, we suggest *C. pallida* should be considered Endangered [EN, B2b(i, ii, iv),c(ii)].

Nomenclatural remarks

The lectotype selected by Hassemer (2020) cannot be accepted since it goes against the original diagnosis and illustration. Therefore, we designate the specimen on the left side of the sheet (B-W01051-010) as the lectotype. The name *C. pallida* Schltdl. was never published by Schlechtendal (1855: 454) and just represents a citation of *C. pallida* Humb. & Bonpl. ex Willd., an error which has been perpetuated by online databases.

Remarks

Commelina pallida is morphologically very similar to *C. texcocana*, and the difference between them has been the source of much debate over the years (e.g., Faden & Hunt 1987; Hunt 1993, 1994, 2001; Espejo-Serna *et al.* 2009; Hassemer 2020). Following Faden & Hunt (1987) and Hunt (1993, 1994, 2001), most subsequent authors have considered both species as synonyms based on them being scrambling herbs, with synflorescence composed of a solitary main florescence, spathe oblique to the peduncle and pointing downwards or continuous to the peduncle and pointing upwards, all sepals glabrous to only setose along the midvein, the paired petals limb base truncate, antherodes with upper lobes reduced and the lower lobes filiform, anthers yellow, lateral anthers held near the medial anther, stigma capitate, fruits with valves splitting all the way to the base becoming tan-coloured when mature, and brown seeds. Nonetheless, *C. pallida* can be differentiated from *C. texcocana* by its stems, leaf-sheaths, leaf-blades and spathe sparsely strigose to strigose with hairs drying light brown to golden (vs stems, leaf-sheaths and blades glabrous, spathe glabrous to velutine, when present hairs hyaline to white in *C. texcocana*), leaf-blades with base obtuse to round (vs cuneate obtuse to round), spathe with apex acute and straight (vs acuminate and slightly falcate), dorsal sepal glabrous to sparsely puberulous along the midvein (vs setose along the midvein), dorsal sepal ovate (vs elliptic to narrowly triangular), lower sepals parallel and ovate (vs divergent and triangular to widely trullate), petals pale lilac to lilac (vs white to light blue), and antherodes scarcely V-shaped (vs X-shaped) (Table 1). Therefore, *C. pallida* is reestablished as a distinct species.

Commelina pseudomonosperma (Kuntze) L.M.Campb.
Figs 11, 13; Table 3

Commelina pseudomonosperma (Kuntze) L.M.Campb. (Campbell in Hokche *et al.* 2008: 714). – *Athyrocarpus pseudomonosperma* Kuntze (Kuntze 1898: 319). – *Phaeosphaerion pseudomonosperma* (Kuntze) Steyerm. (Steyermark 1951: 152).

Etymology

The epithet derives from the combination of the Ancient Greek '*ψευδής*' (*pseudḗs*, meaning 'lying, false') + '*μόνος*' ('*mónos*', meaning 'alone, only, sole, single') + '*σπέρμα*' (*spérma*, meaning 'seed'), in reference to its seeds fused to the fruit wall and septa, giving the impression of being a single seed.

Type material

BRAZIL – **Mato Grosso** • prov. Mato Grosso, in swamp forest near Vila Maria do Paraguai [Cáceres]; Jul. 1892; fr.; *O. Kuntze s.n.*; lectotype: NY [NY00247408]!, designated by Hassemer (2020).

Material examined

BRAZIL – **Mato Grosso** • Itaúba, Resgate de Flora da Linha de Transmissão da UHE Colíder; 3 Jul. 2017; fl., fr.; *M.E. Engels & J.A.O. Freitas 5752*; HERBAM, MBM, NX, RB, TANG • Serra do Roncador, vicinity of Nova Xavantina, margins of Rio Mortes; 25 Sep. 1964; fr.; *G.T. Prance et al. 59106*; MO, NY, US, S.

Description

Herbs 30–90 cm tall, scrambling to prostrate, perennial, robust, terrestrial to paludal. *Roots* fibrous, thin. *Rhizome* short. *Stems* monomorphic, prostrate to scrambling, branched; internodes 0.8–9.1 cm long, distally shorter, light green to green, glabrous, with a line of acicular hairs opposite to the leaves, hairs hyaline or rusty to rusty-brown. *Leaves* distichously-alternate, evenly distributed along the upper part of the stem, pseudopetiolate; sheaths 1–2.2 cm long, light green to light green longitudinally striated with green to dark green, glabrous, sometimes speckled with magenta to vinaceous along the margin, margin upright, glabrous to setose, with a line of setose hairs opposite to the leaves, hairs acicular, light brown to rusty; pseudopetiole 1.4–5.8 mm long; blades 5.6–10.8 × 1.2–3.6 cm, lanceolate to ovate, sometimes elliptic, straight, thinly chartaceous to chartaceous, adaxially dark green to green, abaxially light green, glabrous on both sides, sometimes abaxially inconspicuously scabrid along the midvein at base, hairs acicular, hyaline, base asymmetric to strongly asymmetric, one side cuneate the other round, margin slightly revolute, glabrous to scabrid with prickle-hairs, apex acuminate to long-acuminate; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins 3–4 pairs, adaxially conspicuous, abaxially conspicuous, becoming more conspicuous on both sides when dry. *Synflorescence* composed of a main florescence plus 1–6 co-florescences, axillary and terminal. *Inflorescences* terminal or apparently so, peduncle 0.3–0.9 cm long, shorter than ½ length of the spathe, straight, glabrous to puberulous with hook-hairs, sometimes with a line of acicular hairs opposite to the spathe, hairs hyaline; spathe 1.9–2.3 × 2.1–3.4 cm, very widely ovate to depressed ovate, patent to the peduncle, pale greenish-yellow to yellowish-green, generally suffused with magenta to vinaceous along the margin, internally conspicuously mucilaginous, base only basally connate, splitting open and marcescent in fruit, truncate to subcordate, externally glabrous, rarely with occasional hook-hairs, hairs hyaline, margin repandous, apex acuminate, slightly falcate, veins 4–5 pairs, conspicuous, becoming more conspicuous when dry; upper cincinnus developed, 1–2-flowered, flowers mainly staminate, rarely bisexual, peduncle 1.6–3.3 cm long, exserted, straight to gently decurved at pre-anthesis and anthesis, gently recurved at post-anthesis and fruit, sparsely to densely puberulous with minute hook-hairs, hairs hyaline; lower cincinnus 2–5-flowered, flowers mainly bisexual, sometimes staminate, peduncle 0.7–1.6 cm long, thickened in fruit, glabrous to sparsely puberulous with minute hook-hairs. *Flowers* chasmogamous, strongly zygomorphic, enantiostylous (style gently dislocated to the opposite side to the medial stamen); floral buds 2.6–5.8 × 1.4–4.2 mm, obovoid, light green to white, glabrous; pedicel 3.2–6.9 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, sparsely puberulous with minute hook-hairs, hairs hyaline; sepals hyaline, early deciduous in fruit, dorsal sepal 2.5–3.1 × 1.5–2.1 mm, elliptic, concave, glabrous, apex obtuse, lower sepals 4.9–6.1 × 3.2–4.6 mm, shortly-clawed, connate up to mid-length, oblique-obovate, concave, glabrous, apex obtuse; paired petals 0.5–0.8 × 0.4–0.5 cm, clawed, claw 2.3–3.9 mm long, white to pale lavender to light pink, limb 2.9–4.4 × 3.4–4.9 mm, widely rhombic-reniform to reniform, pale lavender to light pink, base asymmetric, cordate, apex truncate to slightly emarginate, medial petal 5.1–6.3 × 2.2–3.2 mm, sessile, spathulate to oblanceolate, entire, cucullate, concolourous with the paired petals, opaque, glabrous on both sides, apex round; staminodes 2–3, medial staminode completely absent or greatly reduced and lacking the antherode, filaments 2.6–3.3 mm long, arcuate-decurved, white, base pale greenish-yellow, apex tan-coloured, antherodes 0.3–0.5 × 0.2–0.3 mm, subtrapezoid, pale yellow, minute pollen sacs between the upper and lower lobes absent, not apiculate between the upper lobes, upper lobes reduced, smaller than the lower, lower lobes reduced; lateral filaments 4.9–6.1 mm long, straight to very gently sigmoid, apex gently recurved, white, base pale greenish-yellow, apex tan-coloured,

anthers 0.4–0.6 × 0.7–1.2 mm, held near the medial stamen, subcordate to cordate, yellow, connective yellow, pollen pale yellow, drying yellow; medial filament 4.7–6 mm long, straight or arcuate-recurved, suddenly decurved near the apex, white, base pale greenish-yellow, apex tan-coloured, anther 1–1.3 × 0.8–1.2 mm, held with the lateral anthers, widely sagittate, straight to slightly curved, yellow, connective saddle-shaped, pale yellow, anther sacs not appressed to each other, connective yellow, pollen pale yellow, drying yellow; ovary 0.8–1.1 × 0.7–1 mm, 3-carpellate, 5-ovulate, widely ellipsoid to subglobose, greenish-yellow to light green, smooth, puberulous with glandular microhairs, style 5.1–6.7 mm long, exceeding the stamens, base cylindric, straight to very gently sigmoid, white, base pale greenish-yellow, apex tan-coloured, deciduous in fruit, stigma truncate, tan-coloured. *Capsules* 2–4 per spathe, 4.8–6.2 × 4.6–5.1 mm, widely obovoid, short-stipitate, stipe 0.8–1.2 mm long, fruit wall thin, crustaceous, apex round, not constricted between the seeds, pearly-white to silvery when mature, shiny, smooth, 3-locular, indehiscent, dorsal locule 1-seeded, ventral locules 2-seeded. *Seeds* monomorphic, 2.2–4.3 × 1.6–2.7 mm, the dorsal seed slightly larger than the ventral ones, all seeds adnate to the fruit wall and septa forming a dispersal unit, ellipsoid to triangular-ellipsoid, dorsally slightly flattened, ventrally pyramidal, not cleft towards the embryotega, dark grey to black, testa inconspicuously foveolate, non-farinose, embryotega semilateral, inconspicuous, with a prominent apicule, hilum linear, longer than ½ the length of the seed.

Distribution

Commelina pseudomonosperma is currently endemic to the State of Mato Grosso, Brazil (Fig. 11). Campbell (2008) erroneously reports *C. pseudomonosperma* for Venezuela based on misidentified specimens of *C. obliqua*.

Ecology

It grows in the understory in seasonally dry forests in the Amazon Forest and Pantanal biomes, between 170 and 280 m a.s.l. (Fig. 11).

Phenology

It was found in bloom and fruits in July.

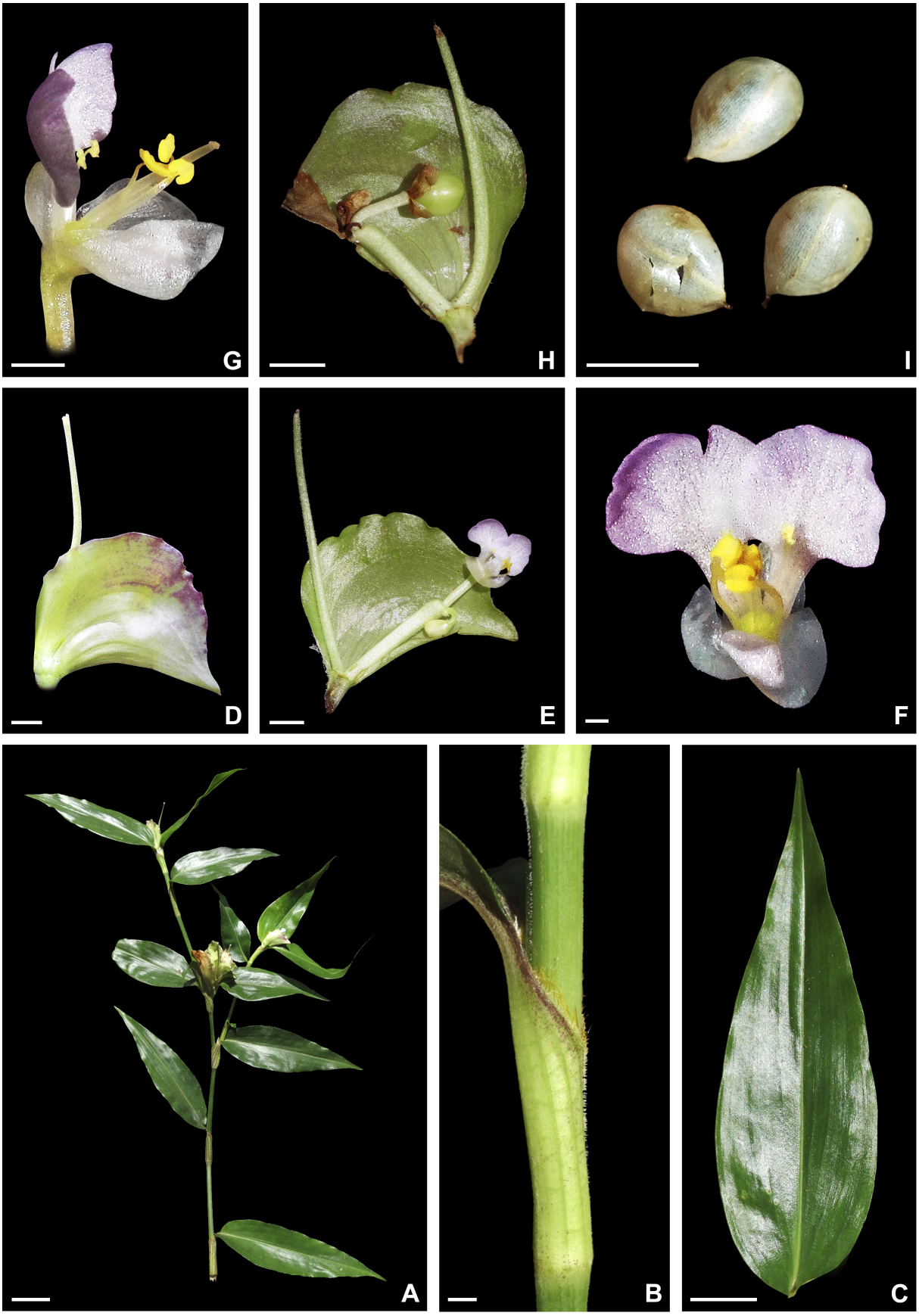
Vernacular names

Trapoeraba rosa (Brazil), manobi-pitanguí (Brazil), andacá-pitanguí (Brazil), Anda ka'a pytãngy (Brazil – Guarani).

Conservation

Commelina pseudomonosperma has a wide EOO (117 138 km^2) but a very narrow AOO (ca 16 km^2), being known from only three localities and two collections. Thus, we suggest it should be considered Endangered [EN, B1ab(i, ii, v)], following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations.

Fig. 13 (next page). *Commelina pseudomonosperma* (Kuntze) L.M.Campb. **A**. Habit. **B**. Leaf-sheath. **C**. Leaf-blade. **D–E**. Inflorescence. **D**. Inflorescence showing pale coloured spathe suffused with vinaceous and repandous margins. **E**. Inflorescence with spathe cut in half showing cincinni arrangement. **F–G**. Flower. **F**. Front view of a bisexual flower showing the cucullate medial petal. **G**. Side view of a bisexual flower showing the cordate lateral anthers. **H**. Inflorescence with spathe cut in half showing immature fruit. **I**. Mature fruits showing their shape, stipe and colouration. All photos by M.E. Engels (*Engels et al. 5752*, MBM). Scale bars: A = 3 cm; B = 1 cm; C = 1.5 cm; D–E, H–I = 5 mm; F = 0.5 mm; G = 2 mm.


G
H
I
D
E
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C

Remarks

Campbell (2008) transferred *Athyrocarpus pseudomonosperma* to *Commelina* but provided no explanation or rationale for her decision. This decision was most likely based on her lack of knowledge of the group, which led to her not only misapplying the newly presented combination but also greatly expanding the distribution of this narrowly endemic species. Further confusion was caused by Hassemer (2020), who reduced *C. pseudomonosperma* and *C. obliqua* (as *C. rufipes* var. *glabrata*) to mere synonyms of *C. rufipes*. These mistakes have been perpetuated by Aona & Amaral (2020), who retained *C. pseudomonosperma* (as *A. pseudomonosperma*) and *C. obliqua* (as *C. rufipes* var. *glabrata*) as a synonym of *C. rufipes*.

Despite the obvious similarity between these species (see Remarks on *C. obliqua* and *C. rufipes*), *C. pseudomonosperma* can be readily differentiated from them due to its pale lavender to light pink flowers (Table 3), a character unique in the South American species of *Commelina* and rare in the genus as a whole. Furthermore, it can be differentiated from *C. obliqua* (the morphologically most similar species) due to its synflorescences axillary and terminal, composed of main florescence plus 1–6 co-florescences (vs terminal and composed of a solitary main florescence in *C. obliqua*), spathe light green suffused with vinaceous or purple, margin repandous (vs almost white to light green, margin flat), petals pale lavender to light pink (vs white), medial petal cucullate and lacking a medial constriction (vs margin revolute at mid-length, forming a medial constriction), antherodes subtrapezoid, indistinctly lobed, minute pollen sacs between the upper and lower lobes absent (vs narrowly hastate, distinctly lobed, minute pollen sacs between the upper and lower lobes present), lateral anthers subcordate to cordate (vs elliptic to ovate), style straight to very gently sigmoid (vs sigmoid), and fruits 2–4 per spathe, widely obovoid (vs widely ellipsoid to widely oblongoid) (Table 3).

Commelina robusta Kunth
Figs 14–15; Table 2

Commelina robusta Kunth (Kunth 1843: 52).

Commelina bambusifolioides Matuda (Matuda 1955: 62). – **Type:** GUATEMALA – **Jutiapa** • Between Jutiapa and La Calera, southeast of Jutiapa; 2 Nov. 1940; fl., fr.; *P.C. Standley 76117*; holotype: F [V0045319F]!. **Syn**. **nov**.

Commelina monticola Seub. (Seubert in Martius 1855: 264). – **Type:** BRAZIL – **Minas Gerais** • s.loc.; Aug. 1840–Apr. 1841; fl.; *P. Claussen 420*; holotype: BR [BR0000021451010]!. **Syn**. **nov**.

Commelina vilavelhensis D.Maia *et al.* (Maia *et al.* 2012: 294). – **Type:** BRAZIL – **Paraná** • Ponta Grossa, Parque Estadual de Vila Velha; 26 Nov. 2005; fl.; *D. Corrêa da Maia 41*; holotype: UPCB [†]; isotypes: HUPG [†], MBM [†]; lectotype: original illustration by D. Maia and later published in Maia *et al.* (2012), designated by Hassemer *et al.* (2016). **Syn**. **nov**.

Etymology

The epithet derives from the Latin '*rōbur*' (a kind of hard oak, or meaning 'hardness, strength') + the suffix '*-ta*' (meaning 'provided with'), in reference to this species' large stature (i.e., strong growth).

Type material

BRAZIL – **Rio de Janeiro** • Brasilia meridionalis, Paraíba do Sul; Dec. 1836; fl., fr.; *F. Sellow B.1308-C.293*; B [B100296353]!.

Selected material examined

North America

MEXICO – **Chiapas** • Anel Albino Corzo, slopes with Pinus and Quercus, 3–5 km above Jaltenango along the road to Finca Prusia; 11 Oct. 1974; fl.; *D.E. Breedlove 38595*; K.

West Indies

TRINIDAD AND TOBAGO – **Trinidad** • Maracas waterfall; 10 Apr. 1920; fl.; *N.L. Britton et al. 1645*; NY, US.

Central America

COSTA RICA – **Cantón de San Ramón** • Cuenca del San Carlos, Los Angeles, 2 km antes del Rio Cataratitas, ruta a Bajo Rodriguez; 28 Jan. 1997; fl., fr.; *A. Rodriguez & V.H. Ramirez 1941*; INB, K 3ex, MO.

EL SALVADOR – **Santa Ana** • Metapan, Hacienda San José; 23 Aug. 1951; fl.; *O. Rohweder 873*; HBG, MO.

GUATEMALA – **Jutiapa** • Between Jutiapa and La Calera, southeast of Jutiapa; 2 Nov. 1940; fl.; *P.C. Standley 76117*; F.

NICARAGUA – **Nueva Segovia** • 7 km S of La Jungla; 31 Jan. 2010; fl., fr.; *W.D. Stevens et al. 29318*; HULE, MO.

South America

ARGENTINA – **Misiones** • Dep. Candelaria; Alrededores de Loreto, selva secundaria con pequeno arroyo; 25 Mar. 1996; fl.; *S.G. Tressens et al. 5536*; CTES, K 2ex.

BOLIVIA – **La Paz** • Prov. Nor Yungas, bajando por Caranavi, de Yolosa 46 km y entrando por San Pedro de León, al lado del rio San Pedro; 2 Jun. 1983; fl., fr.; *G. Beck 9206*; K, UMSA, US.

BRAZIL – **Rio de Janeiro** • Petrópolis, Quitandinha, Pedra do Quitandinha; 2 May 2010; fl., fr.; *M.O.O. Pellegrini 2*; RFA.

COLOMBIA – **Cundinamarca** • Guarama near San Francisco; 27 Mar. 1983; fl., fr.; *J.R.I. Wood 3567*; FMB, K 3ex.

ECUADOR – **Zamora-Chinchipe** • Along road between Zumba and Vilcabamba, 57.9 km N of Zumba, 9.2 km S of Santa Ana, 6.3 km N of Palanda; 28 Jul. 2004; fl., fr.; *T.B. Croat 92498*; AAU, MO, US.

PARAGUAY – **Guaira** • Cordillera de Ybytyruzú, Melgarejo-Cerro Acati, 4km S of Melgarejo on Arroyo Tacuara; 10 Jul. 1992; fl.; *E. Zardini & P. Aquino 32579*; FCQ, MO, RB, US.

PERU – **Cajamarca** • San Ignacio, San José de Lourdes; 16 Feb. 2000; fl., fr.; *J. Campos & R. Vásquez 6435*; K, MO, US.

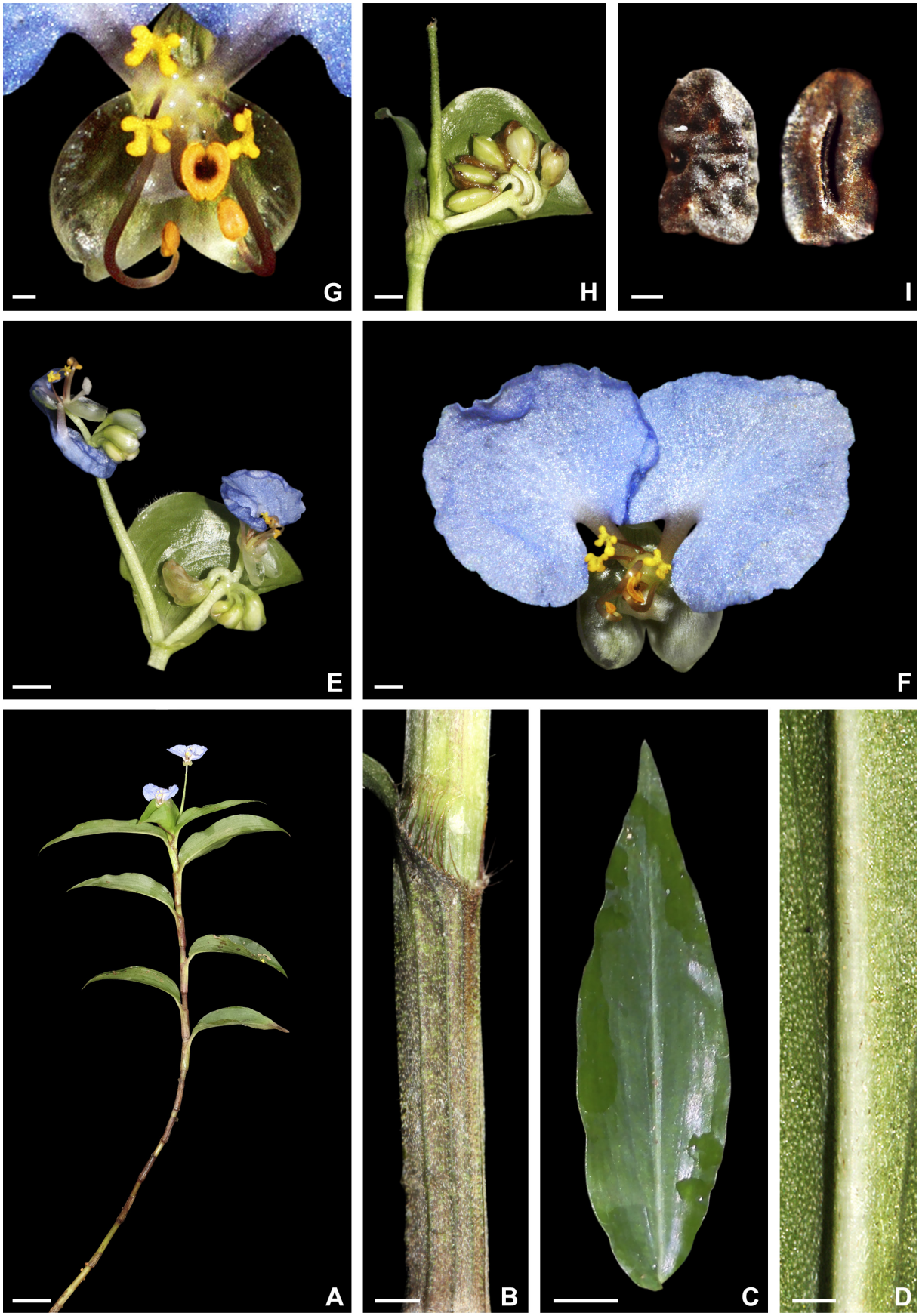
VENEZUELA – **Trujillo** • Boconó, Parque Nacional Guaramacal, Laguna de Aguas Negras, cerca de Batatal; 23 Sep. 2000; fl.; *M. Niño et al. 1345*; PORT, US.

Description

Herbs 40–250 cm tall, prostrate, ascending or scrambling, perennial, robust, rupicolous, terrestrial or paludal, rarely epiphytic. *Roots* fibrous, thin. *Rhizome* short. *Stems* monomorphic, base prostrate, apex

prostrate, ascending or scrambling, branched throughout or branched in the upper third; internodes 0.5–18.5 cm long, distally shorter, light green to green, sometimes suffused with red to vinaceous, glaucous, glabrous to scabrid with prickle-hairs, hairs hyaline. Leaves distichously-alternate, slightly congested at the apex of the stem, pseudopetiolate; sheaths 0.7–6.5 cm long, light green, suffused with red, to vinaceous to atro-purpureous, glaucous, scabrid with prickle-hairs, sometimes with a line of hirsute hairs opposite to the leaves, hairs acicular, red to dark red to atro-vinaceous, margin upright, hirsute, hairs acicular, red to dark red to atro-vinaceous; pseudopetiole 0.1–1.1 cm long; blades (2.5–)3.2–16.2 × 0.8–4.6 cm, lanceolate to ovate, straight, thinly chartaceous, sometimes chartaceous, adaxially dark green to green, abaxially light green, adaxially scabrid with prickle-hairs, abaxially scabrid with prickle-hairs to pilose with acicular hairs, hairs hyaline, base asymmetric, obtuse to round, margin flat, scabrid with prickle-hairs, apex obtuse to acute; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins 2–3 pairs, adaxially conspicuous, abaxially conspicuous, becoming more conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence or main florescence plus 1–10 co-florescences, restricted to the apex of the stems. *Inflorescences* terminal or apparently so, peduncle 0.3–1.8 cm long, shorter than ½ length of the spathe, straight, scabrid with prickle-hairs, hairs hyaline; spathe 0.9–3.4 × 2–4.3 cm, depressed ovate to widely depressed ovate, rarely very widely ovate, patent to the peduncle, concolourous with the leaves, internally conspicuously mucilaginous, base connate up to mid-length, truncate, externally scabrid with prickle-hairs, hairs hyaline, margin flat, apex obtuse to round, sometimes subtruncate, straight, veins 3–4 pairs, inconspicuous, becoming more conspicuous when dry; upper cincinnus developed, 2–6-flowered, flowers mainly staminate, sometimes bisexual, peduncle 1.1–4.2 cm long, exserted, straight at pre-anthesis, anthesis, post-anthesis and fruit, puberulous with minute hook-hairs, hairs hyaline; lower cincinnus 3–7-flowered, flowers mainly bisexual, sometimes staminate, peduncle 0.6–1.8 cm long, thickened in fruit, puberulous with minute hook-hairs. *Flowers* chasmogamous, strongly zygomorphic, enantiostylous (style dislocated to the opposite side to the medial stamen); floral buds 1.6–7.1 × 1.1–7.7 mm, obovoid, light green or white to light blue, glabrous; pedicel 0.4–4.8 cm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, glabrous; sepals hyaline, persistent and accrescent in fruit, dorsal sepal 2.1–4.6 × 1.7–3.2 mm, triangular to widely triangular, concave, glabrous, apex obtuse, lower sepals 3.9–6.8 × 2.3–5.1 mm, shortly-clawed, connate up to mid-length, oblique-obovate to widely oblique-obovate, concave, glabrous, apex obtuse; paired petals 0.8–1.4 × 0.5–1.4 cm, clawed, claw 1.4–4.7 mm long, pale vinaceous, limb 7.6–14.2 × 5.4–13.8 mm, very widely ovate-reniform to depressed ovate-reniform, light blue to blue to lilac-blue or pale lilac to lilac, rarely white, base asymmetric, cordate to sagittate, apex obtuse to round to slightly emarginate, medial petal 5.7–8.3 × 1.9–3.8 mm, sessile, spathulate to obovate, entire, completely involute, discolourous with the paired petals, light blue to pale lilac, hyaline, adaxially glabrous, abaxially puberulous at base with glandular microhairs, apex obtuse; staminodes 3, medial staminode equal to the laterals, filaments 2.3–4.7 mm long, straight to arcuate-decurved, vinaceous, base white to tan-coloured, apex burgundy to atro-vinaceous, antherodes 0.6–1.4 × 0.7–1.8 mm, X-shaped, yellow, minute pollen sacs between the upper and lower lobes present, non-polliniferous or producing very few grains, not apiculate between the upper lobes, upper lobes conspicuous, obovate, shorter than the lower, lower lobes spathulate to obovate; lateral filaments 5.2–9.1 mm long, gently sigmoid to sigmoid, geniculate distal to the middle, apex recurved, vinaceous, base white to tan-coloured, apex sometimes tan-coloured to burgundy, anthers 1.1–1.5 × 0.6–

Fig. 14 (next page). *Commelina robusta* Kunth. **A**. Habit. **B**. Leaf-sheath. **C–D**. Leaf. **C**. Leaf-blade. **D**. Detail of the midvein on the abaxial side of the blade. **E**. Inflorescence with spathe cut in half showing the cincinni arrangement. **F–G**. Flower. **F**. Front view of a bisexual flower. **G**. Close-up of a staminate flower showing the androecium. **H**. Inflorescence with spathe cut in half showing immature fruits. **I**. Dorsal and ventral view of ventral locule seeds. Photos: A, C by J. Freitas (*N.T.L. Pena et al. 174*, VIES); B, D–I by M.O.O. Pellegrini (*Pellegrini 2*, RFA). Scale bars: A = 3 cm; B, D, H = 5 mm; C = 2 cm; E = 4 mm; F = 1.5 mm; G = 2 mm; I = 1 mm.


G
H
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0.9 mm, held near the medial anther, elliptic to ovate, orange-yellow to orange, orange-yellow to orange, pollen orange-yellow to orange, drying orange to buff-orange; medial filament 3.1–6.8 mm long, arcuate-recurved to gently sigmoid, apex strongly recurved, vinaceous, base white to tan-coloured, apex burgundy to atro-vinaceous, anther 1.4–2.1 × 1.1–2 mm, held near the lateral anthers, widely oblong to widely elliptic, slightly curved, orange-yellow to orange, connective shield-shaped, orange-yellow to orange, with an atro-vinaceous to maroon spot at centre, anther sacs not appressed to each other, pollen orange-yellow to orange, drying orange to buff-orange; ovary 1.5–2.3 × 0.8–1.6 mm, 3-carpellate, 5-ovulate, ellipsoid to widely ellipsoid, green, smooth, puberulous with glandular microhairs, style 5.9–10.3 mm long, equalling or slightly exceeding the stamens, sigmoid, base cylindric, apex strongly recurved, vinaceous, base white to tan-coloured, apex tan-coloured, deciduous in fruit, stigma trilobate, white to tan-coloured. *Capsules* 3–5 per spathe, 6.7–10.3 × 4.1–6.9 mm, obovoid, sessile, fruit wall thin, apex truncate, constricted between the seeds, tan-coloured when mature, shiny, smooth, 3-locular, unequally 2-valved, dorsal locule 1-seeded, indehiscent, ventral locules 2-seeded, dehiscent, valves splitting to the base. *Seeds* dimorphic, brown to dark brown; dorsal locule seed 4.1–5.3 × 2.4–3.8 mm, adnate to the fruit wall, widely ellipsoid, dorsiventrally compressed, ventrally flattened, slightly cleft towards the embryotega, testa foveolate, non-farinose, embryotega semilateral, inconspicuous, with a prominent apicule, hilum linear, ca ½ the length of the seed, on a weak ridge; ventral locule seeds 3.3–5.1 × 2–3.4 mm, free from the fruit wall, ellipsoid to reniform, truncate at one end, ventrally flattened, not cleft towards the embryotega, testa rugose-foveolate, sparsely farinose, farinae white, embryotega semilateral, conspicuous, with a prominent apicule, curved, ca ½ the length of the seed, on a strong ridge.

Distribution

From Mexico to Argentina. In Brazil, it is recorded for all regions and States, except for Acre, Amazonas, and Roraima (Fig. 15).

Ecology

Commonly found growing in shady, disturbed areas such as roadsides, gardens and forest margins, and agricultural fields. It is less commonly found growing in drier regions and rocky outcrops.

Phenology

Throughout the year, especially during the rainy season.

Vernacular names

Trapoeraba gigante (Brazil), trapoeraba-açu (Brazil), batata-ovo (Brazil), manobi-açu (Brazil), andacá-açu (Brazil), Anda ka'a açu (Brazil – Guarani).

Uses

Used in traditional medicine and occasionally as food in Brazil. The mucilage secreted by damaged stems is used pure or diluted in water to remove warts or the dermatological bleaching of dark spots and markings. Cooked stems are used to treat dysentery and are occasionally eaten as greens. The infusion prepared using this plant is used in the traditional treatment of ophthalmias (Corrêa 1975; Pellegrini, pers. obs.).

Conservation

Commelina robusta presents a vast extent of occurrence (EOO = 20 747 654 km^2), also occupying a large area (AOO = ca 8540 km^2), and the species does not meet the thresholds for criterium B. The observed populations are large and stable, with several mature individuals and no evidence of current threats. Thus, following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations, *C. robusta* should be considered as Least Concern (LC, criterium B).

Nomenclatural remarks

As aforementioned, the type of *C. obliqua* clearly matches *C. rufipes* var. *glabrata*, as circumscribed by Faden & Hunt (1981). Faden (in Faden & Hunt 1981) informally proposes the synonymisation of *C. robusta* under *C. obliqua* based on his examination of the type specimen of the latter. Despite the unquestionable contributions to the taxonomy and nomenclature presented in Faden & Hunt (1981), the

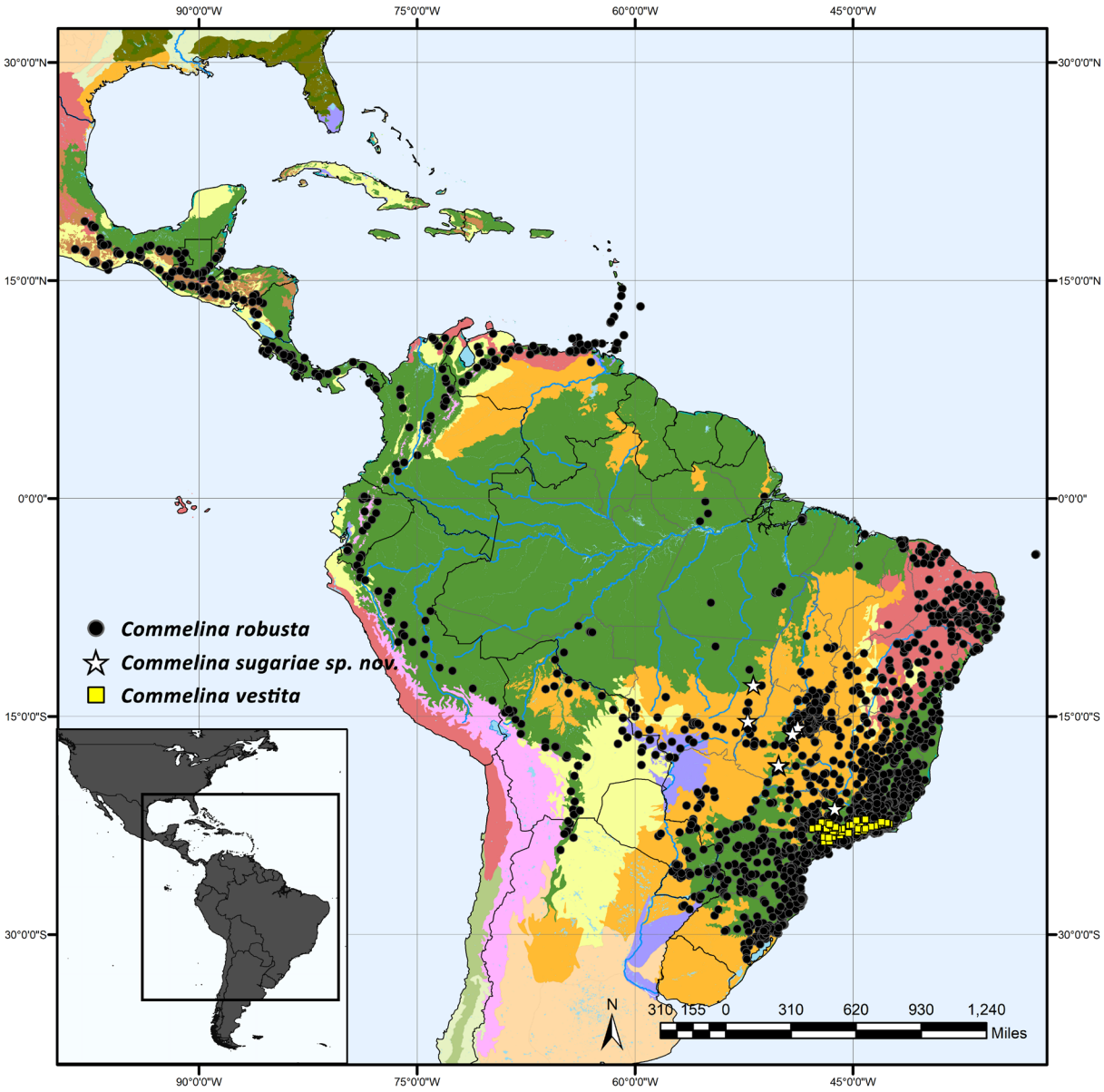


Fig. 15. Distribution map for the *Commelina robusta* complex. Green = Tropical and Subtropical Moist Broadleaf Forests; Pale Yellow = Tropical and Subtropical Dry Broadleaf Forests; Brown = Tropical and Subtropical Coniferous Forests; Tea Green = Temperate Broadleaf and Mixed Forests; Army Green = Temperate Coniferous Forest; Orange = Tropical and Subtropical Grasslands, Savannas and Shrublands; Beige = Temperate Grasslands, Savannas and Shrublands; Lilac = Flooded Grasslands and Savannas; Pink = Montane Grasslands and Shrublands; Olive Green = Mediterranean Forests, Woodlands and Scrubs; Red = Deserts and Xeric Shrublands; Teal = Mangroves and Coastal Environments.

authors fail to realise the conspecificity of *C. obliqua* and *C. rufipes* var. *glabrata* when proposing this new synonym, thus creating further confusion on the identity and application of *C. obliqua* and *C. robusta*. However, as aforementioned, the type specimen of *C. obliqua* disagrees with the current concept of the name, matching that of *C. rufipes* var. *glabrata* instead. Alternatively, the type specimen of *C. robusta* is well-preserved and contains detailed sketches done by Kunth. The type specimen, together with Kunth's drawings and the species' original publication, leaves no doubt of this name's identity and application.

Remarks

Commelina robusta is morphologically similar to *C. vestita* due to their gross morphology, involute and entire medial petal, ovary and capsules smooth, seeds white-farinose, and dorsal seed with testa rugose-foveolate (Table 2). However, *C. robusta* can be differentiated from *C. vestita* by its robust stature (vs delicate in *C. vestita*), stems prostrate to ascending to scrambling, sometimes erect, branched throughout or branched in the upper third, scabrid to glabrous (vs ascending to erect, unbranched to branched at base, velutine to hispid), leaf-sheath margin with red to dark red to atro-vinaceous hairs (vs hairs light brown to brown), blades abaxially light green (vs vinaceous to dark purple), spathe glabrous on both sides, margin setose near the base (vs externally velutine to hispid, internally sparsely velutine, margin glabrous), dorsal sepal triangular to widely triangular (vs elliptic to ovate), paired petals limb very widely ovate-reniform to depressed ovate-reniform (vs ovate-reniform to widely ovate-reniform), medial petal spathulate to obovate, light blue to pale lilac, completely involute (vs petal oblong to oblanceolate, white, apex involute), antherodes not apiculate between the upper lobes (vs apiculate between the upper lobes), anthers orange-yellow to orange (vs pale orange-yellow to pale apricot), and lateral anthers held near the medial anther (vs held near the stigma) (Table 2).

A great deal of morphological variation was recognised in the previous circumscription of *C. robusta* (until now treated as *C. obliqua*). It comprised plants from small to large stature (sometimes way over 1.5 m tall), stems from creeping with ascending apex to erect to scandent, and thin and fibrous to robust and somewhat succulent stems. The leaves ranged from 4–20 cm long, from glabrous to scabrid to pilose, and from light green to vinaceous abaxially. Flower size and colour also varied immensely and were regarded as environmental (Pellegrini & Forzza 2017). On the other hand, Pellegrini & Forzza (2017) also stated that it represented a Pantropical species complex, but that was the best way to deal with this taxon at the time. The synonymy proposed by Hassemer (2020, and references therein) has been carefully reviewed by us and revealed the need to reestablish several names. Alternatively, *C. bambusifolioides*, *C. monticola*, and *C. vilavelhensis* are confirmed to be conspecific with *C. robusta*. This decision is supported by the vegetative and reproductive morphology observed in the type specimens and retrieved from their original publications and illustrations. We have been able to recognise and segregate *C. bambusifolia*, *C. scabrata*, *C. sugariae* sp. nov., and *C. vestita*, aside from *C. huntii* and *C. robusta*. The differentiation between these taxa has previously not been possible due to the lack of fieldwork and proper study of the type specimens and protologues. However, new data made available to MOOP since 2017 has proven key to recognising these species based on macro-morphology. Characters such as leaf-blade architecture, pubescence, degree of connation of the spathe base, development of the upper cincinnus, lower cincinnus pubescence, lower sepals connation, paired petal limb base, the colouration of the medial connective, and fruit and seed morphology have proven key to differentiating these taxa.

Despite our current efforts and updates, which have allowed the recognition of a much more well-delimited taxon, *C. robusta* remains polymorphic, and further studies are still necessary to finesse its circumscription (see Remarks on *C. mathewsii* (C.B.Clarke) Faden & D.R.Hunt).

Commelina rufipes Seub.
Figs 8, 16; Table 3

Commelina rufipes Seub. (Seubert in Martius 1855: 265). – *Commelina rufipes* Seub. var. *rufipes* (Seubert in Martius 1855: 265). – *Phaeosphaerion persicariifolium* var. *rufipes* (Seub.) C.B.Clarke (Clarke

1881: 137). – *Athyrocarpus rufipes* (Seub.) Standl. (Standley & Calderon 1925: 47). – *Phaeosphaerion rufipes* (Seub.) Standl. & Steyerm. (Standley & Steyermeyer 1952: 22). – *Commelinopsis rufipes* (Seub.) D.R.Hunt (Hunt 1981: 195).

Athyrocarpus persicariifolius f. *tetraspermus* Donn.Sm. (Donnel Smith 1903: 54), nom. nud. **Syn**. **nov**.

Etymology

The epithet derives from the Latin '*rūfus*' (which derives from the Proto-Italic '**rouðos*', meaning 'red') + '*pēs*' (meaning 'foot, stem, stalk'), in reference to this species' stems and leaves covered by red to rusty hairs.

Type material

BRAZIL – **São Paulo** • s.loc.; 1817; st.; *C.F.P. Martius s.n.*; lectotype: M [M0210921]!, designated by Pellegrini & Forzza (2017); isolectotype: M [M0210920]! • Bertioga, estrada Bertioga/São Sebastião, bairro São Rafael; 25 Oct. 2007; fl.; *R.C. Forzza et al. 4823*; epitype: RB [RB00515585]!, designated by Pellegrini & Forzza (2017).

Selected material examined

North America

MEXICO – **Tabasco** • Tapijuluya; 5 Jan. 1890; fl.; *J.N. Rovirosa 685*; K, US.

Central America

BELIZE – **Toledo** • on hill slope near Pate's Camp, Edwards Road beyond Columbia; 14 Feb. 1951; fl.; *P.H. Gentle 7204*; P.

COSTA RICA – **Puntarenas** • Cantón de Golfito, peninsula across bay, west from the town of Golfito (generally west of Playa Cacao); 29 Jan. 1992; fl.; *H.H. Schmidt 600*; CR, MO, US 2ex.

EL SALVADOR – **La Libertad** • Comasagua; Dec. 1922; fl.; *S. Calderón 1411*; US.

GUATEMALA – **Alta Verapaz** • Cubilquitz; Nov. 1901; fl.; *H. von Türckheim 8328*; K, MO, US.

HONDURAS – **Distrito Central** • Francisco Morazán, Montana La Tigra 35 km NE de Teguciagalpa, bosque húmedo montano bajo; 16 Oct. 1982; fr.; *D. Montoya 85*; MO.

NICARAGUA – **Atlántico Norte** • along the new road between Rosita and Puerto Cabezas, ca 15.7 km SW of Río Kukalaya; 30 Apr. 1978; fr.; *W.D. Stevens et al. 8474*; MO, US.

PANAMA – **Darien** • trail from Cana to Colombian border along Río Setigandí; 19 Apr. 1980; fr.; *A.H. Gentry et al. 28572*; MO, US.

South America

BOLIVIA – **Santa Cruz** • Velasco Province, *Mauritiella* palm swamp at Cuatro Vientos; 1 Oct. 1995; fr.; *R. Ritter & P. Foster 2480*; MO, NHA, US, USZ.

BRAZIL – **Rio de Janeiro** • Silva Jardim, Reserva Biológica de Poço das Antas, Juturnaíba, trilha Rodolfo Norte, caminho para a Pelonha; 18 Aug. 1995; fl., fr.; *J.M.A. Braga et al. 2735*; RB.

COLOMBIA – **Vaupés** • Río Kananari (affluent of Río Apaporis), Cerro Isibukuri; 3 Aug. 1951; fl.; *R.E. Schultes & I. Cabrera 13258*; COL, K, U.

FRENCH GUIANA – **Camopi** • Arrondissement de Caiena, Cachoeira Três Saltos; 1 Sep. 1960; fl., fr.; *H.S. Irwin et al. 47944*; IAN, MG, MO, NY, RB, US.

PERU – **Loreto** • Maynas, Dtto. Iquitos. Rio Nanay, Carretera de Picuruayco, below Bellavista; 28 Jun. 1974; fl., fr.; *S. McDaniel & M. Rimachi Y. 18845*; RB.

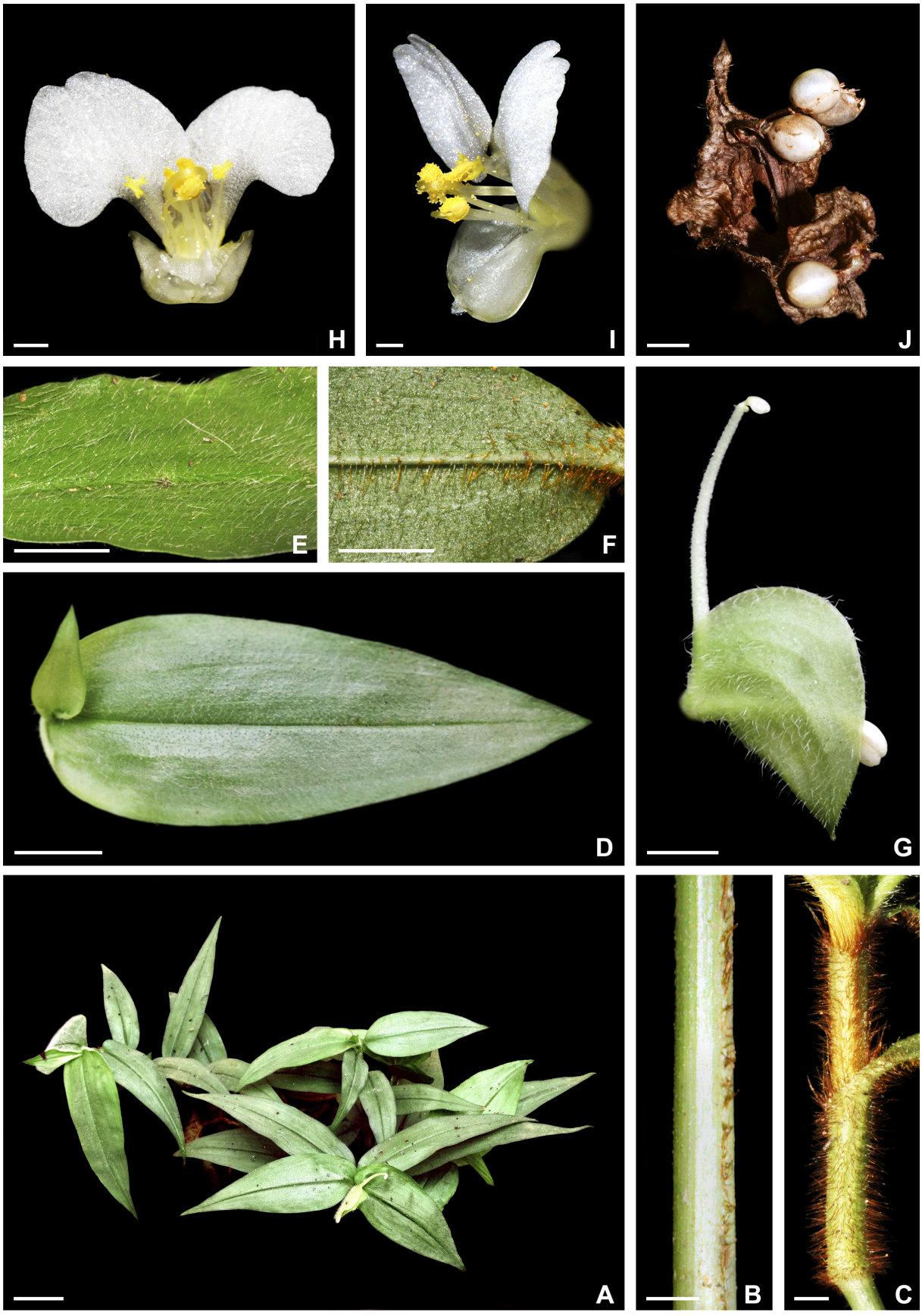
SURINAME – **Sipaliwini** • Vicinity of airstrip along Ulemari River, 71 km up Ulemari River from its confluence with Litani River; 29 Apr. 1998; fl., fr.; *B.E. Hammel et al. 21713*; BBS, LPB, MO, P, U, US.

VENEZUELA – **Barinas** • Distr. Pedraza, trail from Mesa de Canagua to Cerro El Filón, W of the Río Curbatí; 24 Nov. 1990; fl., fr.; *L.J. Dorr et al. 7812*; NY, PORT, US.

Description

Herbs 10–60 cm tall, prostrate to ascending, perennial, delicate to medium-sized, terrestrial. *Roots* fibrous, thin. *Rhizome* short. *Stems* monomorphic, base prostrate, apex prostrate to ascending, unbranched to branched at base; internodes 0.8–7.6 cm long, distally shorter, green, glabrous, with a line of acicular hairs opposite to the leaves, hairs hyaline or rusty to rusty-brown. *Leaves* distichously-alternate, evenly distributed along the stem, pseudopetiolate; sheaths 0.4–1.9 cm long, light green, hirsute, hairs acicular, rusty to rusty-brown, rarely hyaline, margin upright, hirsute, with a denser line of hirsute hairs opposite to the leaves, hairs acicular, rusty to rusty-brown; pseudopetiole inconspicuous up to 2.4 mm long; blades (1.1–)3.5–14.1 × (0.4–)1.2–5.3 cm, lanceolate to elliptic-lanceolate, straight, membranous, adaxially green to bluish-green, abaxially light green, adaxially hispid, abaxially hispid, hairs hyaline, hirsute along the midvein, hairs rusty to rusty-brown, base symmetric, cuneate to obtuse, margin slightly revolute, scabrid with prickle-hairs, apex acute; midvein conspicuous, adaxially impressed to channelled, abaxially prominently obtuse, secondary veins 2–3 pairs, adaxially conspicuous, abaxially conspicuous, becoming more conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence or main florescence plus 1–2 co-florescences, restricted to the apex of the stems. *Inflorescences* terminal or apparently so, peduncle 2.1–6.4 mm long, shorter than ½ length of the spathe, straight, villous with acicular hairs, hairs hyaline; spathe 1.4–4.5 × 1.5–4.8 cm, ovate to widely ovate, patent to the peduncle, light green, internally conspicuously mucilaginous, base only basally connate, splitting open in fruit, truncate to subcordate, externally villous with acicular hairs, hairs hyaline, sometimes with sparse hirsute acicular hairs, hairs rusty to rusty-brown, margin flat, apex acute, straight, veins 4–5 pairs, conspicuous, becoming more conspicuous when dry; upper cincinnus developed, 1–2-flowered, flowers mainly staminate, rarely bisexual, peduncle 1.4–3.6 cm long, exserted, gently decurved at pre-anthesis, anthesis, post-anthesis and fruit, sparsely to densely puberulous with minute hook-hairs, hairs hyaline; lower cincinnus 3–6-flowered, flowers mainly bisexual, sometimes staminate, peduncle 0.8–1.9 cm long, thickened in fruit, glabrous to sparsely puberulous with minute hook-hairs. *Flowers* chasmogamous, strongly zygomorphic, enantiostylous (style gently dislocated to the opposite side to the medial stamen); floral buds 0.9–3.6 × 0.5–2.1 mm, obovoid, light green to white, glabrous; pedicel 1–2.3 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, white to light green, puberulous with

Fig. 16 (next page). *Commelina rufipes* Seub. **A**. Habit. **B**. Stem showing the line of uniseriate rusty hairs opposed to the leaf-blade. **C**. Leaf-sheaths showing the rusty hairs. **D–F**. Leaf. **D**. Leaf-blade. **E**. Detail of the indumentum on the adaxial side of the blade. **F**. Detail of the indumentum on the abaxial side of the blade. **G**. Inflorescence. **H–I**. Flower. **H**. Front view of a bisexual flower showing the androecium and the gynoecium. **I**. Side view of a bisexual flower showing the flat medial petal. **J**. Marcescent spathe surrounding mature and pearl-like fruits. Photos: A, D, G by M.E. Engels (*Engels et al. 8424*, MBM); B–C, E–F, J by M.O.O. Pellegrini (unvouchered); H–I by R. Goldenberg (unvouchered). Scale bars: A, G = 1.5 cm; B–C = 3 mm; D–F = 1 cm; H–I = 1.5 mm; J = 5 mm.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minute hook-hairs, hairs hyaline; sepals hyaline, early deciduous in fruit, dorsal sepal 2.2–3.4 × 1–1.7 mm, elliptic, concave, glabrous, apex acute, lower sepals 3.5–4.8 × 2.4–3.3 mm, shortly-clawed, connate up to mid-length, oblique-obovate, concave, glabrous, apex obtuse; paired petals 0.6–0.9 × 0.5–0.8 cm, clawed, claw 2.4–3.7 mm long, white, limb 3.9–5.4 × 5.5–7.5 mm, rhombic to rotund, white, base asymmetric, round to subtruncate, apex round to slightly emarginate to emarginate, medial petal 3–4.5 × 0.7–1.5 mm, sessile, elliptic to narrowly oblanceolate, entire, flat, concolourous with the paired petals, opaque, glabrous on both sides, apex obtuse; staminodes 2–3, generally medial staminode completely absent or greatly reduced and lacking the antherode, filaments 3.1–4.6 mm long, arcuate-decurved, apex recurved to abruptly recurved, white, base sometimes pale yellow, antherodes 0.4–1 × 0.9–1.2 mm, cordate, pale yellow, minute pollen sacs between the upper and lower lobes absent, apiculate between the upper lobes, upper lobes absent, lower lobes obovoid; lateral filaments 3.1–5.3 mm long, very gently sigmoid to gently sigmoid, apex gently recurved, apex gently recurved, white, base sometimes pale yellow, anthers 1–1.6 × 0.4–0.7 mm, held near the medial stamen, subcordate, yellow, connective yellow, pollen yellow, drying ochre; medial filament 2.5–4.6 mm long, arcuate-recurved, white, base sometimes pale yellow, anther 1.3–2 × 0.5–0.8 mm, held with the lateral anthers, widely oblong to widely elliptic, slightly curved, yellow, connective oblong, yellow, anther sacs not appressed to each other, pollen yellow, drying ochre; ovary 1.3–1.5 × 0.9–1.3 mm, 3-carpellate, 5-ovulate, widely ellipsoid to subglobose, white to pale yellow, smooth, puberulous with glandular microhairs, style 3.4–5.7 mm long, exceeding the stamens, very gently sigmoid to arcuate-decurved, apex strongly decurved, white, base sometimes pale yellow, deciduous in fruit, stigma truncate, white. *Capsules* 2–4 per spathe, 4.3–6.3 × 3.7–6.1 mm, subglobose to globose, short-stipitate, stipe 0.6–1.2 mm long, fruit wall thin, crustaceous, apex round, generally apiculate due to the persistent style base, not constricted between the seeds, pearly-white to silvery when mature, shiny, smooth, 3-locular, indehiscent, dorsal locule 1-seeded, ventral locules 2-seeded. *Seeds* monomorphic, 2.1–3.9 × 1.6–3.1 mm, the dorsal seed slightly larger than the ventral ones, all seeds adnate to the fruit wall and septa forming a dispersal unit, ellipsoid to triangular-ellipsoid, dorsally slightly flattened, ventrally pyramidal, not cleft towards the embryotega, dark grey to black, testa smooth, non-farinose, embryotega semilateral, inconspicuous, with a prominent apicule, hilum linear, longer than ½ the length of the seed.

Distribution

Commelina rufipes is widespread, extending from southern Mexico (States of Tabasco and Chiapas) to Southern Brazil (State of Paraná) (Fig. 8). *Commelina rufipes* presents a peculiar disjunct distribution, altogether skipping seasonally dry forests and savanna-like formations in South America and being absent from the West Indies. This pattern dramatically differs from the morphologically similar but ecologically much more tolerant *C. obliqua*. It is also worth mentioning that the number of records for *C. rufipes* is much smaller when compared with *C. obliqua*. *Commelina rufipes* is primarily absent from Colombia and Venezuela, and entirely absent from Ecuador, even in well-preserved rainforests (Fig. 8). However, the absence of *C. rufipes* from Ecuador and Suriname, as well as from most of Colombia and Venezuela, likely represents a collection gap and/or results from taxonomic confusion with *C. obliqua*. The distribution pattern of *C. rufipes* highlights this species' close association with the major North, Central and South American rainforest biomes (i.e., the Central-American Rainforest, the Chocó-Darién Rainforest from Panama, the Amazon Rainforest, and the Atlantic Rainforest).

Ecology

It grows in the understory of well-preserved rainforests and riparian forests, especially along perennial watercourses.

Phenology

It was found in bloom and fruits throughout the year but peaking during the rainy season. Nonetheless, due to the small size of its white flowers compared to its very showy and conspicuous pearly-white to silvery fruits, it has been poorly collected in bloom.

Vernacular names

Trapoeraba ruiva (Brazil), manobi-pitan (Brazil), andacá-ruivo (Brazil), andacá-pitan (Brazil), Anda ka'a pytã (Brazil – Guarani), zapupa (El Salvador).

Conservation

Commelina rufipes presents wide EOO (14 746 312 km^2) and AOO (ca 3016 km^2) and, thus, does not meet the thresholds for criterium B. No information is currently available on its populational trends or its current threats. Thus, following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations, we suggest *C. rufipes* should be considered as Least Concern (LC).

Remarks

Based on morphological and geographic data, we recognise *C. rufipes* as distinct from *C. obliqua* (previously *C. rufipes* var. *glabrata*) and *C. pseudomonosperma*, in opposition to the very broad circumscription proposed by Hassemer (2020). There is no morphological overlap in any vegetative and reproductive characters of these three closely related species (Table 3). Furthermore, they show noticeable differences in their distribution patterns (Figs 8, 11). *Commelina rufipes* can be very easily recognised, even when lacking flowers and fruits, due to its prostrate stems, characteristically hirsute leaf-sheaths with rusty to rusty-brown hairs, leaf-blades lanceolate to elliptic-lanceolate, opaque and membranous, hispid on both sides with hyaline hairs and sparsely hirsute along the midvein and near the base with rusty to rusty-brown hairs, base symmetric and cuneate to obtuse, and apex acute (Table 3). Furthermore, its spathe is ovate to widely ovate and hispid with hyaline hairs (sometimes with some rusty hairs). Its white flowers present a flat medial petal that ranges from very narrowly elliptic to narrowly elliptic. This combination of characters, plus the fruit and seed characters shared with *C. pseudomonosperma* and *C. obliqua* (previously *C. rufipes* var. *glabrata*), make this species unique in the genus and very readily diagnosed (Table 3).

Commelina scabrata Seub.
Figs 4, 17–18; Table 2

Commelina scabrata Seub. (Seubert in Martius 1855: 266). – *Phaeosphaerion persicariifolium* var. *scabratum* (Seub.) C.B.Clarke (Clarke 1881: 137).

Etymology

From the Latin '*scabrā*' (meaning 'rough, scratchy, itchy') + the suffix '*-āta*' (indicating the possession of a particular feature), in reference to its leaves covered by scabrid hairs.

Type material

BRAZIL – **Espírito Santo** • crescit in interioribus prov. Bahiensis; s.dat.; fl.; *C.F.P. von Martius s.n.*; lectotype: M [M0274913]!, designated by Hassemer *et al.* (2016); isolectotype: M [M0274914]!.

Selected material examined

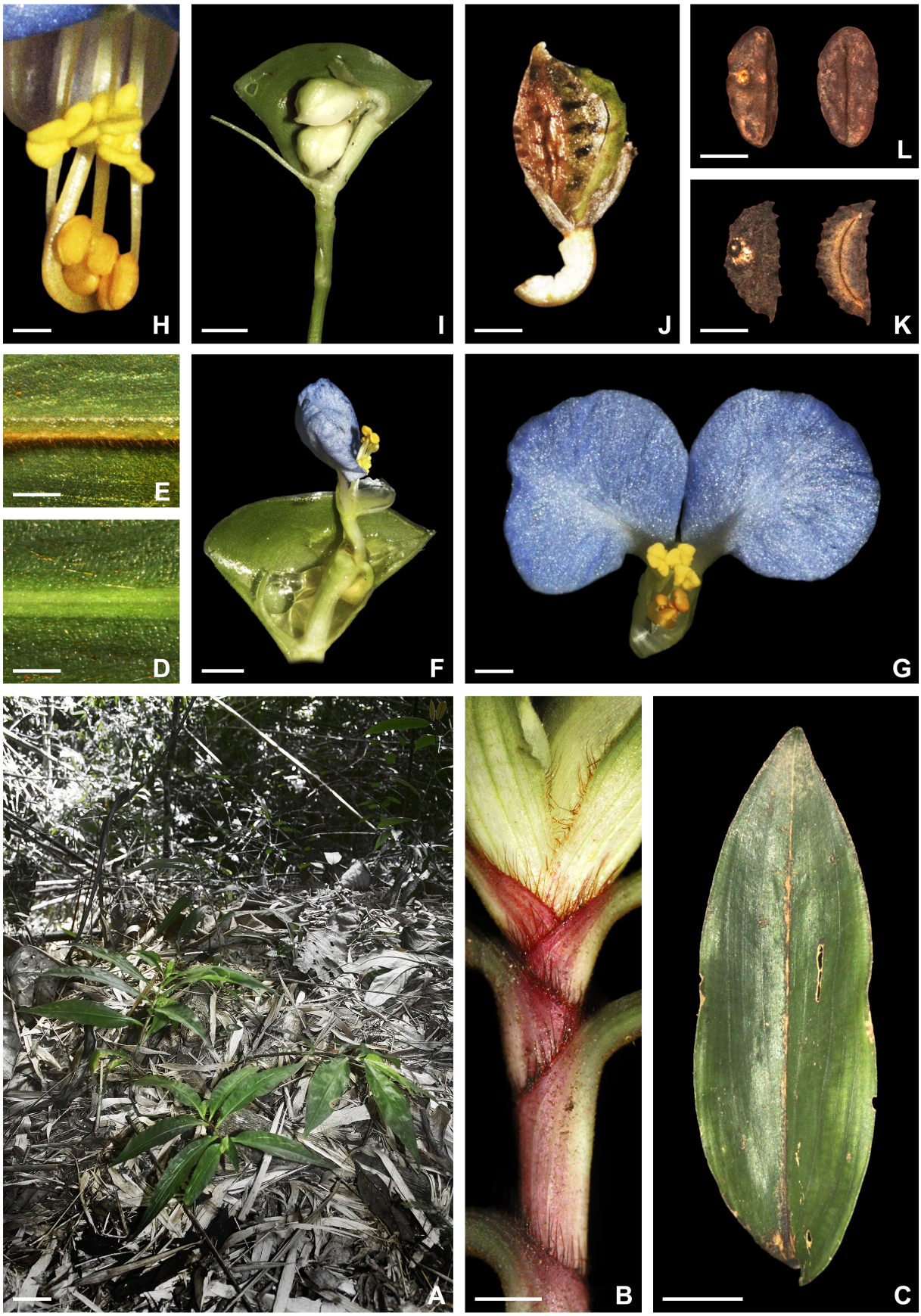
BRAZIL – **Espírito Santo** • Estação Biológica de Santa Lúcia, trilha para o túmulo de Augusto Ruschi, ao lado da ponte José Molina; 26 Jun. 2012; fl., fr.; *M.O.O. Pellegrini et al. 248*; RB, VIES. – **Rio de**

Janeiro • Santa Maria Madalena Parque Estadual do Desengano. Horto Santos Lima, cede do parque, próximo a caixa d'água, no bambusal; 6 Feb. 2016; fl., fr.; *M.O.O. Pellegrini et al. 486*; K, P, RB, SPF, US. – **São Paulo** • Itanhaém, Ilha Queimada Grande; 5 Mar. 2015; fl.; *A.M. Magalhães & L.G.S. Amorim 95*; RB, SPF.

Description

Herbs 20–50 cm tall, ascending, perennial, robust, rupicolous or terrestrial. *Roots* fibrous, thin. *Rhizome* short. *Stems* monomorphic, ascending, unbranched or branched only at base; internodes 0.6–8.4 cm long, distally shorter, green to dark green, scabrid with prickle-hairs to hispid with a mixture of prickle- and acicular hairs, hairs hyaline, longer acicular ones sometimes rusty, with a line of acicular hairs opposite to the leaves, hairs dark brown to red to dark red. *Leaves* distichously-alternate, congested in the upper part of the stem, pseudopetiolate; sheaths 0.9–2.8 cm long, light green, sometimes suffused with magenta to red opposite to the blade, scabrid with prickle-hairs to hispid with a mixture of prickle- and acicular hairs, hairs hyaline, with a line of hispid hairs opposite to the leaves, hairs acicular, dark red to dark red to atro-vinaceous, margin upright, hispid, hairs acicular, dark red to dark red to atro-vinaceous; pseudopetiole 0.4–3.9 cm long; blades (2.2–)4.3–13.7 × 0.9–3.6 cm, narrowly oblong to narrowly elliptic, obliquely asymmetric, thinly chartaceous to chartaceous, adaxially green to dark green, abaxially light green, sometimes with vinaceous to dark purple variegation, adaxially glabrous to hispid, abaxially hispid, hirsute along the midvein, hairs acicular, rusty or hyaline, base asymmetric, cuneate, margin flat, scabrid, apex acuminate to long-acuminate; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins 3–4 pairs, adaxially conspicuous, abaxially inconspicuous, becoming conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence or main florescence plus 1–2 co-florescences, restricted to the apex of the stems. *Inflorescences* terminal or apparently so, peduncle 4.3–9.1 mm long, shorter than ½ length of the spathe, straight, glabrous to sparsely scabrid with prickle-hairs, hairs hyaline; spathe 1.3–3.6 × 1.9–4.3 cm, widely depressed ovate-triangular to depressed ovate-triangular, patent to the peduncle, concolourous with the leaves, internally conspicuously mucilaginous, base connate up to the apex or almost so, truncate, externally hispid to hirsute, hairs hyaline or rusty, margin flat, apex obtuse to acute, straight, veins 3–4 pairs, inconspicuous, becoming conspicuous when dry; upper cincinnus vestigial, flowerless, peduncle 1.9–3.3 cm long, included, gently recurved at pre-anthesis, anthesis, post-anthesis and fruit, sparsely puberulous with minute hook-hairs, hairs hyaline; lower cincinnus 1–3-flowered, flowers mainly bisexual, rarely staminate, peduncle 3.3–5.4 cm long, thickened in fruit, glabrous to sparsely puberulous with minute hook-hairs towards the apex. *Flowers* chasmogamous, strongly zygomorphic, enantiostylous (style gently dislocated to the opposite side to the medial stamen); floral buds 2.2–6.5 × 3.7–6.1 mm, obovoid, light green or light blue, glabrous; pedicel 0.9–1.4 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, glabrous; sepals hyaline, persistent and accrescent in fruit, dorsal sepal 3.2–4.8 × 1.9–2.6 mm, elliptic to narrowly triangular, concave, glabrous, apex acute, lower sepals 4.2–6.3 × 4.7–5.9 mm, shortly-clawed, connate up to the upper third, oblique-obovate to widely oblique-obovate, concave, glabrous, apex round; paired petals 9.8–15.3 × 8.8–13.8 mm, clawed, claw 3.9–6.1 mm long, white to light blue, limb 5.9–9.2 × 8.8–13.8 mm, widely transversally rhombic to widely depressed obovate, sky blue, base asymmetric,

Fig. 17 (next page). *Commelina scabrata* Seub.; *M.O.O. Pellegrini et al. 486* (RB). **A**. Habit. **B**. Leaf-sheaths showing their red colouration and the rusty hairs along the margin. **C–E**. Leaf. **C**. Leaf-blade. **D**. Detail of the indumentum on the adaxial side of the blade. **E**. Detail of the indumentum on the abaxial side of the blade. **F**. Inflorescence with the spathe cut in half showing the cincinni arrangement. **G–H**. Flower. **G**. Front view of a bisexual flower. **H**. Detail of the androecium and the gynoecium. **I**. Inflorescence with the spathe cut in half, showing immature fruits. **J**. Mature capsule. **K**. Dorsal and ventral view of a ventral seed. **L**. Dorsal and ventral view of the dorsal seed. All photos by M.O.O. Pellegrini. Scale bars: A = 2 cm; B = 1 cm; C, F, I–J = 5 mm; D–E = 1 mm; G = 2 mm; H, K–L = 0.5 mm.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cuneate, apex obtuse to round, medial petal 4.3–6.1 × 1.4–3.2 mm, sessile, lanceolate to ovate, entire, apex involute, discolourous with the paired petals, white, hyaline, glabrous on both sides, apex acute to acuminate; staminodes 3, medial staminode equal to the laterals, filaments 3.4–5.1 mm long, straight to arcuate-recurved, white, apex yellowish-orange to cream-orange, antherodes 1.6–1.8 × 1.4–1.6 mm, X-shaped, yellow, minute pollen sacs between the upper and lower lobes present, non-polliniferous or producing very few grains, not apiculate between the upper lobes, upper lobes conspicuous, very widely obtriangular to subquadrangular, larger than the lower, lower lobes widely oblong to subquadrangular; lateral filaments 6.7–10.3 mm long, straight to very gently sigmoid, base gently recurved, white, base light green, apex yellowish-orange to cream-orange, anthers 1.6–1.9 × 1.3–1.5 mm, held with the medial anther, elliptic to ovate, orange-yellow to orange, pollen yellowish-orange to cream-orange, drying orange-yellow to apricot; medial filament 5.2–9.4 mm long, straight to arcuate-decurved, apex suddenly recurved, white, apex yellowish-orange to cream-orange, anther 1.9–2.2 × 1.4–1.7 mm, held with the lateral anthers, widely oblong to widely elliptic, slightly curved, orange-yellow to orange, connective oblong, orange, anther sacs not appressed to each other, pollen yellowish-orange to cream-orange, drying orange-yellow to apricot; ovary 1.2–1.7 × 0.9–1.5 mm, 3-carpellate, 5-ovulate, very widely fusiform to subglobose, green, sparsely verrucose, puberulous with glandular microhairs, style 1–1.3 cm long, equalling or exceeding the stamens, very gently sigmoid, apex recurved, base tapering into the ovary, apex strongly involute, white, base light green, apex yellowish-orange to cream-orange, deciduous in fruit, stigma trilobate, tan-coloured. *Capsules* 1–2 per spathe, 1.3–1.6 × 1–1.3 cm, prismatic, sessile, fruit wall thin, apex rostrate, slightly constricted between the seeds, tan-coloured to greenish-brown, speckled with dark brown, shiny when immature, becoming off-white with tan-coloured speckles when parasitised by weevil larvae or when mature, opaque, verrucose, 3-locular, unequally 2-valved, dorsal locule 1-seeded, indehiscent, ventral locules 1-seeded, dehiscent, valves splitting only up to mid-length. *Seeds* dimorphic, brown to dark brown; dorsal locule seed 0.9–1.4 × 0.4–0.7 cm, adnate to the fruit wall, ellipsoid, dorsiventrally compressed, ventrally flattened, slightly cleft towards the embryotega, testa shallowly foveolate, non-farinose, embryotega semidorsal, conspicuous, without a prominent apicule, hilum linear, ca the same length as the seed; ventral locule seeds 1–1.4 × 0.4–0.6 cm, free from the fruit wall, ellipsoid to slightly falcate, ventrally flattened, not cleft towards the embryotega, testa sparsely echinate, sparsely farinose, farinae white, embryotega semilateral, conspicuous, with a prominent apicule, hilum C-shaped, ca the same length as the seed.

Distribution

Commelina scabrata is endemic to Brazil, States of Espírito Santo, Rio de Janeiro and São Paulo (Fig. 4).

Ecology

It grows in the understory of conserved and disturbed Atlantic Forest fragments, between 600–1000 m a.s.l. It is found growing along or near watercourses or in permanently moist forest patches.

Phenology

It was found in bloom and fruits from January to June. The floral morphology, more specifically, the prematurely involute style causing the stigma to be held with the anthers combined with the lack of observed floral visitors in the wild and cultivation, indicate this self-compatible species mainly relies on selfing (Pellegrini, pers. obs.).

Commelina scabrata has a unique association with a weevil (Curculionoidea, Coleoptera) (Fig. 18). Each capsule is predated by a single egg laid inside the fruit during its initial developmental stages. The larva bores its way out of the fruit, eating the developing seeds and septae, leaving intact the outer part of the fruit (Fig. 18C). The remaining capsule wall is used by the larva as a shelter (Fig. 18A–C), where they grow to the size of the capsule (Fig. 18G–H). The fruit might also serve as a shell for the weevil's

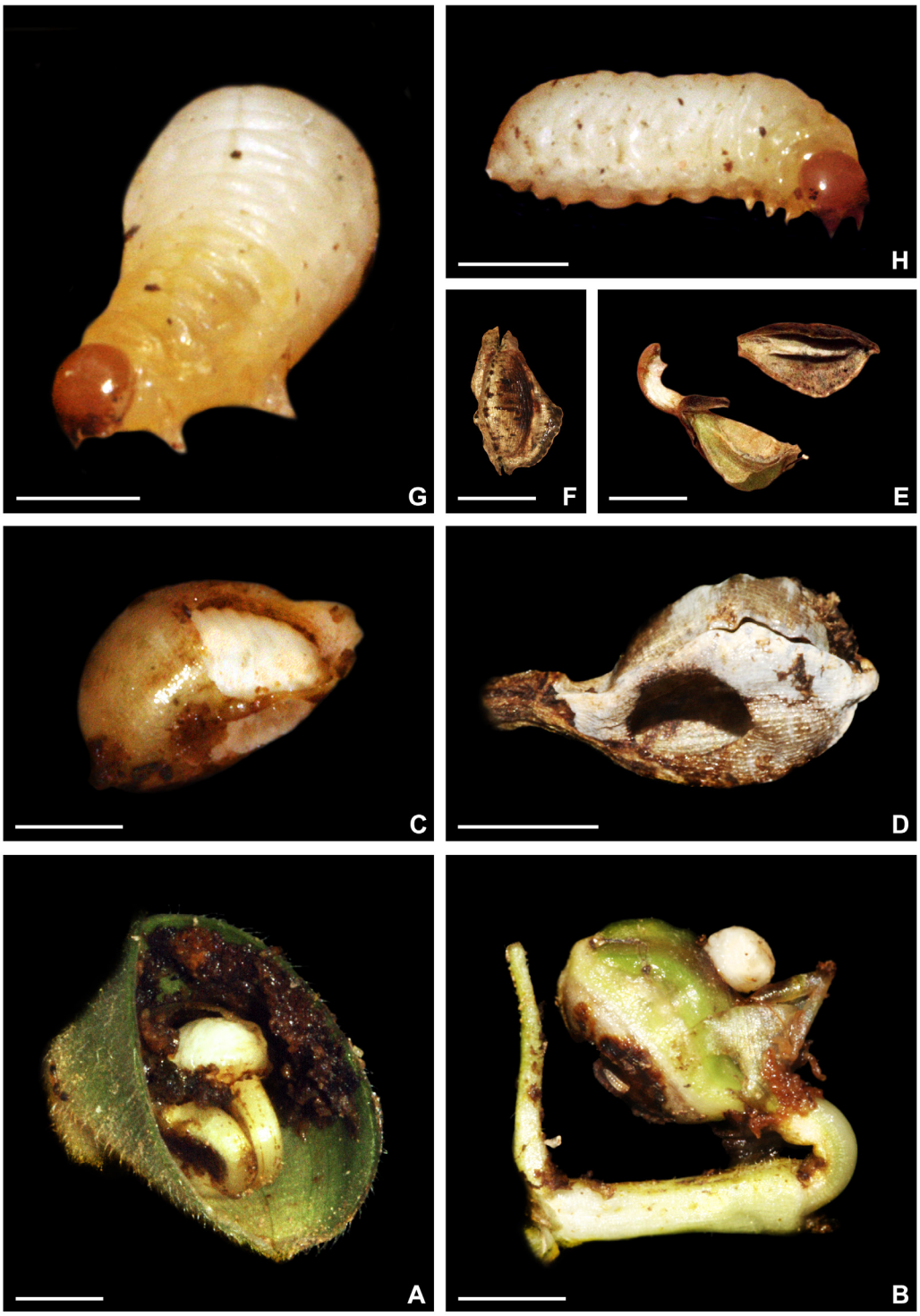


Fig. 18. *Commelina scabrata* Seub.; *M.O.O. Pellegrini et al. 486* (RB). **A**. Inflorescence with spathe opened showing weevil larva feeding on an immature fruit, surrounded by its droppings. **B**. Inflorescence with spathe completely removed, showing a fruit being parasitised by a weevil larva. **C–D**. Parasitised fruit. **C**. Fruit still with the larva inside. **D**. Fruit abandoned by the weevil pupa showing its off-white colouration. **E–F**. Healthy fruit. **E**. Dehisced capsule with seeds removed to show the locules. **F**. Detail of the dorsal valve still containing the seed. **G–H**. Weevil larva. **G**. Front view of the larva. **H**. Side view of the larva. All photos by M.O.O. Pellegrini. Scale bars = 0.5 mm.

pupa stage, but further observations are still required (Pellegrini, pers. obs.). After the weevil has left the predated fruit, the capsule acquires an off-white and opaque colouration, which is retained in herbarium specimens (Fig. 18D), in opposition to its immature colouration (tan-coloured to greenish-brown, speckled with dark brown, and shiny; Figs 17J, 18E–F). Out of the analysed herbarium specimens and plants studied in the field and kept in cultivation, between 80–90% of the capsules were predated, significantly affecting the species' seed set. Unfortunately, we have been unable to observe and/or collect pupa and adult stages of this weevil, preventing a more precise identification.

Vernacular name

Trapoeraba lixa (Brazil).

Conservation

Despite its wide EOO (222 614 km^2), *C. scabrata* has a considerably reduced AOO (ca 412 km^2) due to the small number of known records and extant populations. All observed populations were small, with fewer than 20 mature individuals, all of them growing in disturbed environments (Pellegrini, pers. obs.). Despite flowering and fruiting being common and fairly constant, over 90% of observed fruits were predated by weevil larvae (Fig. 18). The predated fruits have all their seeds entirely eaten by the larvae, effectively preventing successful sexual reproduction. The frequency of predation is so high that all analysed herbarium specimens presented predated fruits and no seeds. Mature seeds were only accidentally but successfully observed in cultivation (Fig. 17K–L). Nonetheless, the observed populations seem to remain stable, primarily due to clonal reproduction (Pellegrini, pers. obs.). Thus, following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations, we suggest *C. scabrata* be considered Endangered [EN, B2b(ii, iii)c(iv)+C2a(i)].

Remarks

Similar to *Commelina bambusifolia*, due to their hirsute leaf-sheaths, blades narrowly oblong to narrowly elliptic, obliquely asymmetric, abaxially hirsute along the midvein, margin smooth, apex acuminate to long-acuminate, upper cincinnus vestigial and included, lower cincinnus glabrous, paired petals limb with base cuneate, medial anther lacking a vinaceous to dark purple spot on the connective, fruits opaque off-white when mature, all locules 1-seeded (Table 2). However, it can be differentiated by its leaf-blades hispid on both sides, hairs rusty or hyaline, base cuneate, paired petals limb sky blue, fruits prismatic, sparsely verrucose, apex aristate, consistently parasitised by weevil larvae, unequally 2-valved, valves splitting only up to mid-length, seeds dimorphic, dorsal locule seed adnate to the fruit wall, and ventral locule seeds free from the fruit wall (Table 2). It is superficially similar to *C. obliqua* and *C. rufipes* due to its rusty leaves and white fruits. However, it can be readily differentiated by its aborted and included upper cincinnus (vs developed and exserted in *C. obliqua* and *C. rufipes*), paired petals blue with a cuneate limb (vs white, cordate), involute medial petal (vs straight), antherodes with upper lobes larger than the lower ones (vs smaller), anthers orange-yellow to orange (vs yellow), fruits dehiscent, prismatic, opaque and verrucose (vs indehiscent, globose to subglobose, shiny and smooth), and seeds dimorphic and ornate (vs monomorphic and smooth to inconspicuously foveolate).

The capsules of *C. scabrata* are very peculiar and present a unique combination of characters in the genus (i.e., prismatic shape, fruit wall thin, apex rostrate, slightly constricted between the seeds, verrucose ornamentation, dark brown maculated colouration when immature, changing to off-white when parasitised by weevil larvae or when mature, indehiscent dorsal valve and ventral valves splitting only up to mid-length). The ventral seeds of *C. scabrata* are also unique amongst the Neotropical species of *Commelina* due to their D-shaped outline and sparsely echinate testa. The dorsal seeds also stand out due to having a different outline, colouration, testa ornamentation and deposition, embryotega position and development, and hilum shape. Finally, the aforementioned paired petals limb with cuneate limb base are, so far, known

only for *C. bambusifolia* and *C. scabrata* amongst Neotropical *Commelina*. With such a combination of peculiar and unique morphological characters, it seems surprising that *C. scabrata* has remained an obscure and misunderstood species for so long.

Commelina sugariae M.Pell. sp. nov.
urn:lsid:ipni.org:names:77347327-1
Figs 15, 19; Table 2

Diagnosis

Similar to *C. robusta* and *C. vestita* due to their gross morphology, paired petals light blue to blue to sky blue or pale lilac to lilac, medial petal involute, entire, ovary and capsules smooth, seeds white-farinose, and testa rugose-foveolate. However, *C. sugariae* sp. nov. can be readily differentiated from both species due to its medial anther connective with an orange-brown spot at centre, its peculiar 2-carpellate, oblong and dorsiventrally compressed ovary, and capsules equally 2-valved, oblong to rectangular, dorsiventrally compressed, 4-seeded, and seeds homomorphic.

Etymology

The epithet honours Rebecca Rea Sugar, USA animator, director, screenwriter, producer, storyboard artist, voice actor, singer-songwriter, and creator of the Cartoon Network animated series 'Steven Universe'. Sugar is the first non-binary person to create a series for Cartoon Network independently. Sugar identifies as bisexual, non-binary, and genderqueer, using she/they pronouns. Sugar's queerness has served as their inspiration for stressing the importance of LGBTQIA+ representation in art, especially in children's entertainment, clearly visible in both 'Steven Universe' and 'Adventure Time'. The latter series had Sugar up to 2013 as a writer, storyboard artist, singer-songwriter, and voice actor.

Type material

BRAZIL – **Mato Grosso** • 9 km E of the base camp of the expedition, base camp, ca 270 km N of Xavantina; 18 Apr. 1968; fr.; *J.A. Ratter 1073*; holotype: K [K001245927]!; isotypes: NY [NY00872565]!, P [P01742698]!, UB [no. 3785] n.v.

Other material examined (Paratypes)

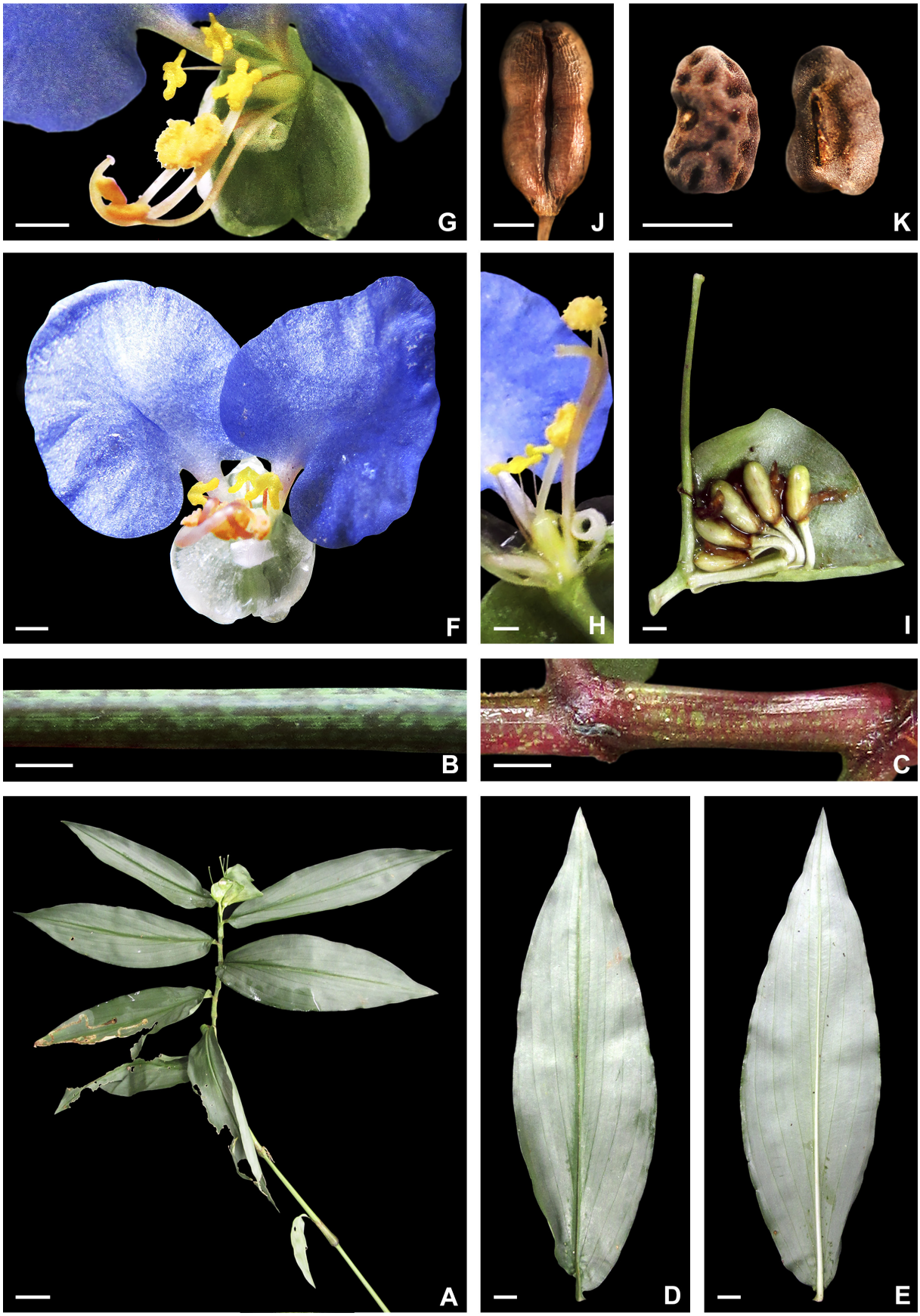
BRAZIL – **Goiás** • Gouvelândia, Unidade de Conservação Ricardo Machado Borges, floresta estacional semidecídua; 453 m a.s.l.; 25 Feb. 2023; fl.; *I.L. Morais 7965*; JAR, K, RB • Gouvelândia; 455 m a.s.l.; 26 Feb. 2023; fl.; *I.L. Morais 7989*; JAR, RB • Gouvelândia; 455 m a.s.l.; 18 Mar. 2023; fl.; *I.L. Morais 8063*; JAR, K, NY, P, RB, SP, SPF, UB • Gouvelândia; 449 m a.s.l.; 19 Mar. 2023; fl.; *I.L. Morais 8090* JAR, K, RB, SP, SPF, UB • Gouvelândia; 453 m a.s.l.; 2 Apr. 2023; fl.; *I.L. Morais 8125*; JAR • Gouvelândia; 453 m a.s.l.; 29 Apr. 2023; fl.; I.L. Morais 8179; JAR, K, UB • Serra dos Pirineus, Pico dos Pirineus, ca 20 km NW of Corumbá de Goiás, near road to Niquelândia; ca 1400 m a.s.l.; 28 Jan. 1968; fl., fr.; *H.S. Irwin et al. 19370*; K, NY, UB. – **Mato Grosso** • ca 14 km W of Km 90 of the Xavantina-Aragarças road, Vales dos Sonhos; 1 Apr. 1968; fl., fr.; *D. Philcox & B. Freeman 4669*; K, NY, P, UB. – **Minas Gerais** • Monte Belo, Fazenda Lagoa; 21 Mar. 1981; fl., fr.; *M.C. Weyland Vieira 441*; K, RB • Monte Belo, Fazenda Monte Alegre, Mata Mundo Novo; 21 Feb. 1982; fl.; *M.C. Weyland Vieira 295*; K.

Description

Herbs 30–100 cm tall, ascending, perennial, robust, terrestrial or paludal. *Roots* fibrous, thin. *Rhizome* short. *Stems* monomorphic, herbaceous to slightly succulent, base prostrate, apex ascending to suberect, rooting at base, occasionally rooting at the nodes touching the substrate, sparsely branched throughout; internodes 1.2–7.5 cm long, distally shorter, green to dark green, sometimes sparsely to densely speckled

with vinaceous spots, glaucous, puberulous with glandular microhairs, generally with a sparse hirsute line opposite to the leaves, hairs acicular, rusty to rusty-brown to red to dark red to atro-vinaceous. *Leaves* distichously-alternate, congested at the apex of the stem, pseudopetiolate; sheaths 1–2.5 cm long, glaucous, green to dark green, sometimes with red to vinaceous striations or reticulations up to almost entirely red to vinaceous, puberulous with glandular microhairs, hairs hyaline, with a hirsute line opposite to the blade, hairs acicular, rusty to rusty-brown to red to dark red to atro-vinaceous, rarely with a sparse line of hirsute hairs continuous to the blade's midvein, hairs acicular, rusty to rusty-brown, margin upright, hirsute, hairs acicular, rusty to rusty-brown to red to dark red to atro-vinaceous; pseudopetiole 0.3–1.1 cm long; blades (2.3–2.8–)5.8–15.9 × (0.9–1.4–)2.5–5.5 cm, elliptic to widely elliptic to obovate, slightly falcate, membranous to thinly chartaceous, adaxially evenly dark green or with 2 broad and irregular silvery-green longitudinal stripes, sometimes the stripes so broad as to make the entire blade silvery-green with an irregular dark green stripe along the midvein, drying greyish-green to olive-green with an irregular lighter stripe along the midvein, sometimes dark brown, abaxially light green to greyish-green, drying olive-green to light brown, adaxially scabrid with prickle-hairs, sometimes sparsely hispidulous with a mixture of prickle- and acicular hairs, hairs hyaline, abaxially hispidulous to densely hispidulous with acicular hairs or a mixture of prickle- and acicular hairs, hispid along the midvein with acicular hairs, hairs hyaline, sometimes rusty to rusty-brown at blade base, base asymmetric, cuneate to obtuse, margin flat, scabrid with prickle-hairs, apex acute to acuminate; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins 3–4 pairs, adaxially conspicuous, abaxially inconspicuous, becoming conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence or a main florescence and 1–8 co-florescences, restricted to the apex of the stems, sometimes also axillary along the distal part of the stems. *Inflorescences* terminal and apparently terminal, peduncle 0.3–1.3 cm long, straight, sparsely pilose to pilose with minute hook-hairs, hairs hyaline; spathe 1.3–3.4 × 2.1–4.3 cm, widely ovate to very widely ovate, patent to the peduncle, concolourous with the leaves, internally conspicuously mucilaginous, base connate for 3.7–7.8 mm, truncate to round, rarely cordate, externally sparsely pilose to pilose with minute hook-hairs or with a mixture of hook- and glandular microhairs, hairs hyaline, sometimes with sparse to occasional hispid setose hairs, hairs hyaline, pilose with minute hook-hairs along the fused base, sometimes with a mixture of minute hook- and hispid acicular hairs, hairs hyaline, margin flat, glabrous to sparsely hispid near the base, hairs acicular, hyaline, sometimes rusty, internally with occasional acicular hairs, hairs hyaline, apex obtuse to acute, straight, veins 5–6 pairs, inconspicuous, becoming conspicuous when dry; upper cincinnus developed, 2–4-flowered, flowers mainly staminate, sometimes bisexual, peduncle 0.7–2.4 cm long, exserted, J-shaped to decurved at pre-anthesis, gently decurved at anthesis, post-anthesis and fruit, pilose with hook-hairs, hairs hyaline; lower cincinnus 2–6-flowered, flowers mainly bisexual, rarely staminate, peduncle 0.5–1.3 cm long, thickened in fruit, sparsely puberulous with a mixture of hook- and glandular microhairs, hairs hyaline; bracteoles early deciduous, ovate, hyaline, inconspicuous, margin entire, glabrous. *Flowers* chasmogamous, strongly zygomorphic, enantiostylous (style gently dislocated to the opposite side to the medial stamen); floral buds 2.2–4.9 × 1.4–2.9 mm, obovoid, slightly falcate, light blue to blue, glabrous; pedicel 1.5–4.3 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, apex puberulous with glandular microhairs, hairs early deciduous, hyaline; sepals white, hyaline, persistent and accrescent in

Fig. 19 (next page). *Commelina sugariae* M.Pell. sp. nov. **A**. Habit. **B**. Stem. **C**. Leaf-sheaths. **D–E**. Leaf-blade. **D**. Adaxial side of the blade. **E**. Abaxial side of the blade. **F–H**. Flower. **F**. Front view of a bisexual flower. **G**. Close-up of a bisexual flower showing the androecium. **H**. Close-up of a bisexual flower with one of the paired petals removed showing the completely involute medial petal and the 2-carpellate ovary. **I**. Inflorescence with the spathe cut in half, showing immature fruits. **J**. Dorsal view of a mature fruit showing the absence of the dorsal carpel/locule. **K**. Dorsal and ventral view of a seed. Photos: A–I by I.L. de Morais (*I.L. Morais 7965*, JAR); J–K by M.O.O. Pellegrini (holotype, *J.A. Ratter 1073*, K). Scale bars: A = 2.5 cm; B–C = 5 mm; D–E = 1 cm; F–H = 0.5 mm; I–K = 1.5 mm.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fruit, dorsal sepal 3.5–4.7 × 1.3–2.7 mm, elliptic to ovate, concave, glabrous, apex acute, lower sepals 4.3–6.2 × 2.9–4.6 mm, shortly-clawed, connate for a third of their length, claw 0.5–1.2 mm long, limb 3.8–5 × 2.9–4.6 mm, widely oblique-ovate to depressed oblique-ovate, concave, glabrous, apex round; paired petals 3.4–7.1 × 4.8–5.6 mm, clawed, claw 2.1–3.5 mm long, mauve, becoming pale pink to pale lilac towards the limb, rarely white, limb 2.8–4.7 × 4.8–5.6 mm, ovate-reniform to widely ovate-reniform, light blue to blue to sky blue, base asymmetric, cordate to sagittate, apex round to slightly emarginate, medial petal 5.5–6.1 × 0.5–0.9 mm, sessile, oblanceolate, entire, completely involute, discolourous with the paired petals, white, hyaline, glabrous on both sides, apex obtuse; staminodes 3, medial staminode shorter than the laterals, filaments 2–3.4 mm long, straight to arcuate-decurved, vinaceous to mauve, base tan-coloured, antherodes 0.7–0.8 × 0.3–0.6 mm, X-shaped, yellow, minute pollen sacs between the upper and lower lobes present, non-polliniferous or producing very few grains, not apiculate between the upper lobes, upper lobes conspicuous, spathulate to obovate, gently curved outwards, much smaller than the lower, lower lobes spathulate to obovate; lateral filaments 4.8–6.8 mm long, strongly sigmoid, geniculate distal to the middle, apex recurved, vinaceous to mauve, base and apex tan-coloured, anthers 1.1–1.3 × 0.7–1 mm, held near the medial anther, oblong to elliptic, orange-yellow to apricot, drying pale yellow, connective orange-yellow to pale apricot, pollen orange-yellow to pale apricot, drying pale yellow; medial filament 2.2–4.6 mm long, straight to arcuate-decurved, apex gently recurved, white, apex tan-coloured, anther 1.5–1.9 × 0.9–1.6 mm, held near the lateral anthers, widely oblong to widely elliptic, slightly curved, pale orange-yellow to pale apricot, drying pale yellow, connective shield-shaped, orange-yellow to apricot, with a orange-brown spot at centre, anther sacs not appressed to each other, pollen orange-yellow to pale apricot, drying pale yellow; ovary 1–1.9 × 0.4–0.9 mm, 2-carpellate, 4-ovulate, oblong, dorsiventrally compressed, light green, smooth, puberulous with glandular microhairs, style 3.6–7.4 mm long, ca the same length as the stamens, gently sigmoid to sigmoid, apex strongly recurved, base not tapering into the ovary, white, apex sometimes tan-coloured, deciduous in fruit, stigma trilobate, white to tan-coloured. *Capsules* 3–5 per spathe, 5.2–7 × 2.2–3.5 mm, oblong to rectangular, dorsiventrally compressed, sessile, fruit wall thin, apex truncate to slightly emarginate, constricted between the seeds when immature and mature, light green when immature, tan-coloured when mature, shiny, glabrous, smooth, 2-locular, equally 2-valved, valves splitting to base, locules 2-seeded. *Seeds* 2 per locule, 2–2.4 × 1.3–1.7 mm, monomorphic, all free from the capsule wall, ellipsoid, dorsiventrally compressed, ventrally flattened, slightly cleft towards the embryotega, testa rugose-foveolate, brown to dark brown, covered by a thin, white farinae, embryotega semilateral, inconspicuous, with a prominent apicule, hilum curved, longer than ½ the length of the seed, on a strong ridge.

Distribution

Commelina sugariae sp. nov. is endemic to Brazil and is currently known by a handful of collections from the States of Goiás, Mato Grosso and Minas Gerais (Fig. 15).

Ecology

It grows in the understory of gallery forests of central Brazil in the Cerrado biome, between 850–1400 m a.s.l. It is found growing on permanently moist soil along riverbanks.

Phenology

It was found in bloom and fruits from January to April, which coincides with the rainy season in central Brazil.

Vernacular name

Trapoeraba gigante (Brazil).

Conservation

Despite its wide EOO (192 551 km^2), *C. sugariae* sp. nov. has a considerably reduced AOO (ca 32 km^2) due to the limited number of known records and extant populations. The species is most likely more frequent throughout its EOO, but due to its superficial similarity to the frequent and widely distributed *C. robusta*, most specimens are currently misidentified. Until herbaria from central Brazil have their collections reviewed and more recent collections become known, we follow the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations and suggest *C. sugariae* should be considered Data Deficient (DD).

Remarks

Commelina sugariae sp. nov. is peculiar among the Neotropical species of *Commelina* due to its 2-carpellate ovary, which develops into a dorsiventrally compressed, rectangular, equally 2-valved capsule. In the Neotropics, these characters are only shared with the distantly related and morphologically very distinct *C. platyphylla* Klotzsch ex Seub. It is morphologically most closely related to *C. robusta* and *C. vestita* due to their paired petals being light blue to blue to sky blue or pale lilac to lilac, medial petal involute, entire, ovary and capsules smooth, seeds white-farinose, and testa rugose-foveolate. However, *C. sugariae* can be easily differentiated from these species due to its peculiar 2-carpellate, oblong and dorsiventrally compressed ovary, equally 2-valved oblong to rectangular, dorsiventrally compressed, capsules 3–4 per spathe, 4-seeded, and seeds monomorphic.

Commelina sugariae sp. nov. can be further differentiated from *C. vestita* due to their obvious differences in stature (robust in *C. sugariae* vs delicate in *C. vestita*), stem posture, branching, appearance and pubescence (base prostrate, apex ascending to scrambling, branched throughout or branched in the upper third, glaucous, and puberulous with glandular microhairs vs ascending to erect throughout, unbranched or branched only at base, not glaucous, and velutine to hispid with acicular hairs), sheath pubescence (puberulous with glandular microhairs, rarely with a sparse line of rusty to rusty-brown hairs continuous to the blade's midvein, margin with rusty to rusty-brown to red to dark red to atro-vinaceous hairs vs velutine to hispid, margin with light brown to brown hairs), leaf-blades' colouration and pubescence (abaxially light green to greyish-green, adaxially scabrid, sometimes sparsely hispidulous, abaxially hispidulous to densely hispidulous, hispid along the midvein vs abaxially light green speckled with vinaceous to dark purple to completely vinaceous to dark purple, adaxially densely velutine to velutine, abaxially velutine to hispid), spathe shape (widely ovate to very widely ovate vs cordate to widely cordate, rarely depressed ovate), lower sepals limb shape (widely oblique-ovate to depressed oblique-ovate vs obovate to widely obovate), paired petals claw colouration (mauve to lilac, rarely white vs blue to sky blue), medial petal colouration and posture (light blue to pale lilac, completely involute vs white, apex slightly involute), filament colouration (vinaceous to mauve vs white to tan-coloured), anther colouration and placement (orange-yellow to apricot, lateral anthers held near the medial anther vs pale orange-yellow to pale apricot, lateral anthers held near the stigma, medial anther held near the antherodes), and the number of capsules per spathe (3–4 vs 6–9) (Table 2).

Despite being morphologically very similar to the widespread and still morphologically variable *C. robusta*, *C. sugariae* sp. nov. can be unambiguously differentiated based on the following characters: stem pubescence (puberulous with glandular microhairs in *C. sugariae* vs glabrous to scabrid with prickle-hairs in *C. robusta*), leaf-blade variegation (adaxially evenly dark green or with 2 broad and irregular silvery-green longitudinal stripes vs never variegated), leaf-blade abaxial pubescence (hispidulous to densely hispidulous, hispid along the midvein, sometimes rusty at blade base vs scabrid to pilose, hairs hyaline), spathe shape, pubescence and apex (widely ovate to very widely ovate, externally sparsely pilose to pilose with minute hook-hairs or with a mixture of hook- and glandular microhairs, sometimes with sparse to occasional hispid setose hairs vs depressed ovate to widely depressed ovate, rarely very widely ovate, externally scabrid with prickle-hairs, apex obtuse to round), bracteole shape (ovate vs very widely

ovate to depressed ovate), dorsal sepal shape (elliptic to ovate vs triangular to widely triangular), paired petals limb shape (ovate-reniform to widely ovate-reniform vs very widely ovate-reniform to depressed ovate-reniform), medial petal shape and pubescence (oblanceolate, glabrous on both sides vs spathulate to obovate, abaxially puberulous at base with glandular microhairs), antherode morphology (upper lobes conspicuously shorter than lower ones vs upper lobes equal to subequal to lower ones) (Table 2).

It is also superficially similar to *C. scabrata* due to their gross morphology, leaf-blades abaxially hispid to hirsute with rusty hairs along the midvein, spathe eventually hispid to hirsute with rusty hairs, and 2-valved fruits. However, they can be readily differentiated by their leaf-sheath pubescence (scabrid in *C. sugariae* sp. nov. vs hirsute in *C. scabrata*), blades shape, curvature, pubescence and apex (lanceolate to ovate, straight, scabrid or velutine on both sides, apex obtuse to acute vs narrowly oblong to narrowly elliptic, obliquely asymmetric, abaxially hirsute along the midvein, apex acuminate to long-acuminate), spathe connation and aspect in fruit (connate up to mid-length, remaining green vs connate to the apex or almost so, marcescent), upper cincinnus development and pubescence (developed, flowered, peduncle exserted from the spathe, lower cincinnus pilose with hook-hairs vs vestigial, flowerless, peduncle included in the spathe, lower cincinnus glabrous to sparsely puberulous with minute hook-hairs towards the apex), lower sepals connation (connate up to the upper third vs connate up to mid-length), paired petals limb base shape (cordate vs cuneate), medial anther colouration (with a vinaceous to dark purple spot on the connective vs lacking a vinaceous to dark purple spot on the connective), capsules colouration when mature (tan-coloured and shiny vs off-white and opaque), and the number of seeds per locule (locules 2-seeded vs locules 1-seeded) (Table 2).

It is worth mentioning that the specimen *Weyland Vieira 441* housed at the UEC herbarium (barcode 131898) actually represents *Tripogandra diuretica* (Mart.) Handlos, and thus, is excluded as a paratype.

Commelina texcocana Matuda

Figs 2, 20; Table 1

Commelina texcocana Matuda (Matuda 1955: 60).

Etymology

The epithet derives from the combination of the type locality 'Texcoco' + the Latin suffix '*-ānā*' (indicating a place of origin).

Type material

MEXICO – **México** • Texcoco, Molino de la Flor; 2300 m a.s.l.; 6 Aug. 1950; fl., fr.; *E. Matuda 19249*; lectotype: MEXU [MEXU00090886]!, designated by Espejo-Serna & López-Ferrari (1995); isolectotypes: F [V0045324F, V0045323F]!, MEXU [MEXU00090880]!.

Selected material examined

MEXICO – **Distrito Federal** • Pedregal; 16 Jun. 1938; fl.; *E.K. Balls 4822*; US. – **Guanajuato** • Apaseo el Grande, cerca de Ixtla; 16 Aug. 1986; fl.; *J. Rzedowski 40348*; MEXU. – **Hidalgo** • La Veguita, 5 km al NE de Metzquititlán; 3 Nov. 1975; fl., fr.; *F. González Medrano et al. 8445*; MEXU. – **Jalisco** • Valle de México, Mt. Zacoalco, près Gualalupe; 10 Aug. 1907; fl.; *G. Arsène 648*; CLF, P 4ex. – **México** • Cambaya, San Juanico [San Juan Ixhuatepec], Tlalnepantla de Baz; 11 Aug. 1913; fl.; *G. Arsène 8787*; P. – **Michoacán** • Morelia Punguato; 5 Sep. 1917; fl., fr.; *G. Arsène 8661*; B, CAS, K, MA, MEXU, MO, P 2ex, US. – **Puebla** • vicinity of Puebla; 11 Aug. 1906; fl.; *G. Arsène 492*; US. – **Querétaro** • parte baja del cerro en Tequiquiapan; 11 Oct. 2004; fl.; *L. Hernádez 5478*; MEXU, QMEX.

Description

Herbs 70–150 cm tall, scrambling, perennial, robust, terrestrial or paludal. *Roots* tuberous, cylindric, with apical fusiform tubers. *Rhizome* short. *Stems* dimorphic, branched in the upper third; internodes 0.4–9.8 cm long, distally shorter, green suffused with red to atro-vinaceous, glabrous, with a sparse line of acicular hairs opposite to the leaves, hairs hyaline, primary branches ascending, rooting only at the base, secondary branches longer than the primary branches, scrambling, apex ascending. *Leaves* distichously-alternate, evenly distributed along the upper part of the stem, pseudopetiolate; sheaths 1.4–3.6 cm long, light green suffused with red to atro-vinaceous, glabrous, with a sparse line of setose hairs opposite to the blade, hairs acicular, hyaline, margin upright, ciliate, hairs acicular, hyaline; pseudopetiole inconspicuous to up to 5.6 mm long; blades 2–10.5 × (0.4–0.5–)1.2–3.1 cm, elliptic to lanceolate, straight, membranous to thinly chartaceous, adaxially dark green, abaxially light green, glabrous on both sides, base slightly asymmetric to symmetric, cuneate, margin flat, scabrid, apex acute to acuminate; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins 2–3 pairs, adaxially conspicuous, abaxially inconspicuous, becoming conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence, restricted to the apex of the stems and forming a dense second-degree synflorescence. *Inflorescences* leaf-opposed, peduncle 1.2–4.1 cm long, the same length or longer than ½ length of the spathe, straight, velutine, hairs acicular, with a line of minute hook-hairs opposed to the spathe, hairs hyaline to white; spathe 1.9–4.6 × 1.3–3.9 cm, cordate, oblique to the peduncle and pointing downwards or continuous to the peduncle and pointing upwards, concolourous with the leaves, internally inconspicuously mucilaginous, base free, subcordate to round, externally glabrous to velutine, hairs hyaline to white, margin flat, apex acuminate, slightly falcate, veins 3–4 pairs, inconspicuous, becoming conspicuous when dry; upper cincinnus vestigial, flowerless, peduncle inconspicuous to up to 3.8 mm long, included, gently recurved at pre-anthesis and anthesis, recurved and exserted at post-anthesis and fruit, glabrous with some odd hook-hairs towards the apex, hairs hyaline; lower cincinnus 2–5-flowered, flowers mainly bisexual, rarely staminate, peduncle 6.2–11.2 mm long, thickened in fruit, sparsely puberulous with minute hook-hairs towards the apex. *Flowers* chasmogamous, zygomorphic, enantiostylous (style dislocated to the opposite side to the medial stamen); floral buds 2.6–5.7 × 3.7–6.1 mm, obovoid, light green or white to light blue, dorsally setose, hairs hyaline; pedicel 1.9–5.5 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, pilose with acicular hairs, hairs hyaline; sepals light green, opaque, persistent and accrescent in fruit, dorsal sepal 3.8–5 × 1.3–2.9 mm, elliptic to narrowly triangular, concave, setose along the midvein, hairs acicular, long, hyaline, apex acute, lower sepals 4.4–5.9 × 2.8–4.6 mm, sessile, free, triangular to widely trullate, concave, glabrous, apex obtuse; paired petals 8.3–11.5 × 5.8–7.4 mm, clawed, claw 2.7–4.3 mm long, white to light blue or mauve-purple to purple, limb 5.6–7.3 × 5.8–7.4 mm, widely reniform to widely rhombic-reniform, white or light blue to blueish-purple, base asymmetric, truncate, apex obtuse, medial petal 4.3–6.1 × 3.5–4.5 mm, shortly-clawed, claw 0.7–1.2 mm long, white to light blue or mauve-purple to purple, limb 3.8–4.9 × 3.5–4.5 mm, widely sagittate, entire, concave, concolourous with the paired petals, opaque, glabrous on both sides, apex obtuse; staminodes 2, medial staminode completely absent, filaments 4–5 mm long, straight to arcuate-decurved, white or light blue, base white or mauve-purple, upper half light blue or purple, antherodes 0.4–0.9 × 0.6–0.8 mm, scarcely X-shaped, white, minute pollen sacs between the upper and lower lobes present, non-polliniferous or producing very few grains, not apiculate between the upper lobes, upper lobes reduced, depressed obovate, much smaller than the lower, lower lobes filiform; lateral filaments 6–8 mm long, gently sigmoid, geniculate distal to the middle, apex gently recurved, white or light blue, base white or mauve-purple, apex light blue or purple, anthers 0.9–1.1 × 0.4–0.6 mm, held near the medial anther, sagittate, pale yellow to yellow, connective white to cream-coloured, pollen yellow, drying ochre; medial filament 5–8 mm long, arcuate-decurved, apex recurved to strongly recurved, white or light blue, base white or mauve-purple, apex light blue or purple, anther 1.5–1.9 × 0.7–0.8 mm, held near the lateral anthers, oblong-sagittate to saddle-shaped, curved, pale yellow to yellow, connective hastate, white to cream-coloured, anther sacs appressed to each other,

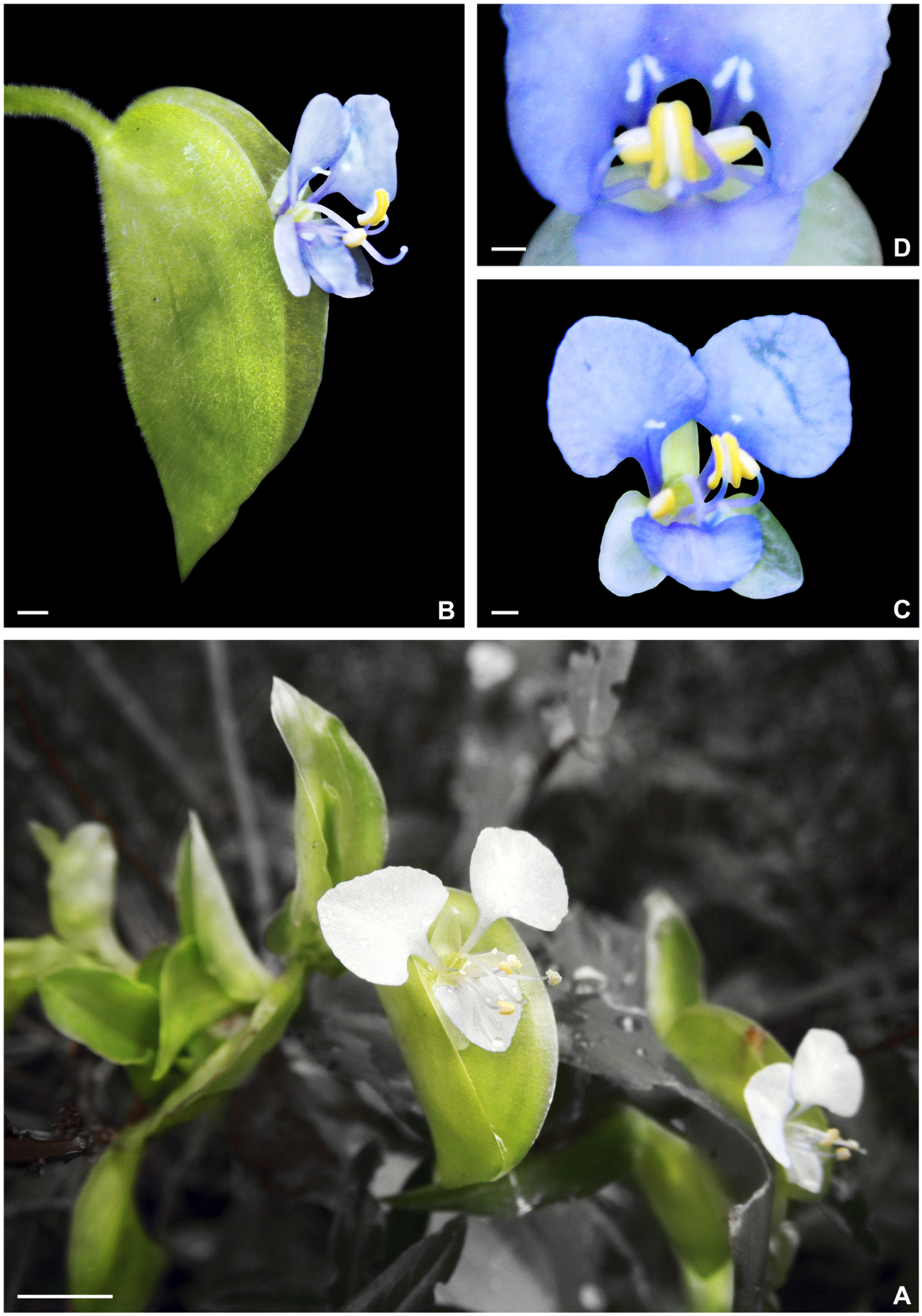


Fig. 20. *Commelina texcocana* Matuda; A = *F. Cabrera 709* (HUAA), B–D = *F. Cabrera 824* (HUAA). **A**. Habit of a white-flowered individual. **B**. Inflorescence. **C–D**. Flower. **C**. Front view of a bisexual flower. **D**. Close-up of a bisexual flower showing the androecium. All photos by F. Cabrera Manuel. Scale bars: A = 5 mm; B–C = 1 mm; D = 0.5 mm.

pollen yellow, drying ochre; ovary 1.3–1.9 × 0.7–1.1 mm, 3-carpellate, 5-ovulate, ellipsoid to widely ellipsoid, green, smooth, glabrous, style 6–8 mm long, equalling or exceeding the stamens, sigmoid, base tapering into the ovary, apex strongly recurved, white or light blue, base white or mauve-purple, apex light blue or purple, deciduous in fruit, stigma capitate, white. *Capsules* 1–2 per spathe, 6.2–8.1 × 2.8–4 mm, fusiform to ellipsoid, short-stipitate, stipe 0.8–1.4 mm long, fruit wall thick, apex rostrate, not constricted between the seeds when mature, becoming constricted between the seeds when mature, tan-coloured when mature, opaque, smooth, 3-locular, 3-valved, valves splitting to base, dorsal locule 1-seeded, dehiscent, ventral locules 2-seeded, dehiscent. *Seeds* dimorphic, dark brown to black; dorsal locule seed 3.1–3.9 × 2.3–2.8 mm, free from the fruit wall, ellipsoid, dorsiventrally compressed, ventrally flattened, slightly cleft towards the embryotega, testa shallowly rugose, with some small furrows on the side opposed to the embryotega, densely farinose, farinae cream-coloured, embryotega semilateral, inconspicuous, with a prominent apicule, hilum linear, longer than ½ the length of the seed; ventral locule seeds 1.9–2.5 × 1.8–2.6 mm, free from the fruit wall, triangular, truncate at one end, ventrally flattened, not cleft towards the embryotega, testa shallowly rugose to irregularly rugose, densely farinose, farinae cream-coloured, embryotega semilateral to lateral, inconspicuous, with a prominent apicule, hilum linear, ca ½ the length of the seed.

Distribution

Commelina texcocana is currently endemic to central Mexico (the Distrito Federal and the States of México and Michoacán) (Fig. 2).

Ecology

It grows in lower altitude water-lodge seasonal formations, generally between bushes and close to water bodies.

Phenology

It was found in bloom and fruits from August to September.

Vernacular names

Tetzocana (Mexico), hierba del pollo (Mexico).

Conservation

Commelina texcocana is known from several locations, presents a very wide EOO (251 840 km^2) and a wide AOO (ca 736 km^2), and does not meet the thresholds for criterium B. No information is currently available on this species' populational trends or threats. Therefore, following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations, we recommend *C. texcocana* should be considered Least Concern (LC, criterium B).

Remarks

Commelina texcocana is similar to *C. almandina* sp. nov. and *C. pallida* due to its peduncle and spathe straight, spathe base subcordate to round, pedicels pilose with acicular hairs, style slightly longer than the stamens, stigma white, fruits dehiscent, 3-valved, fruit wall thick, opaque and constricted between the seeds when mature, with apex rostrate, style deciduous in fruit, dorsal locule 1-seeded, ventral locules 2-seeded, and seeds dimorphic, ellipsoid and ventrally flattened (Table 1). As aforementioned, *C. texcocana* and *C. pallida* have been traditionally confused due to their morphological similarity. Nonetheless, both of them can be differentiated based on the colouration of their stem, leaf-sheath and leaf-blade indumentum, leaf-blade base shape, shape and posture of the spathe apex, sepals pubescence, shape of the dorsal sepal, the position of the lower sepals, petal colouration, and antherode morphology (Table 1).

Commelina vestita Seub.
Figs 15, 21; Table 2

Commelina vestita Seub. (Seubert in Martius 1855: 264). – *Commelina monticola* var. *vestita* (Seub.) C.B.Clarke (Clarke 1881: 162). – *Commelina robusta* f. *vestita* (Seub.) Standl. & Steyerm. (Standley & Steyermeyer 1944: 33).

Etymology

The epithet derives from the Latin '*vestīo*' (meaning 'cloth, dress, cover') + the suffix '*-īta*' (indicating the possession of a particular feature), in reference to the dense velutine to hispid indumentum covering most of this species' organs.

Type material

BRAZIL – **São Paulo** • Brasilia meridionali; s.dat.; fl., fr.; *F. Sellow 5313*; B [†] • Brasilia meridionali; s.dat.; fl., fr.; *F. Sellow 5313*; lectotype: BR [BR0000035068044]!, **designated here**.

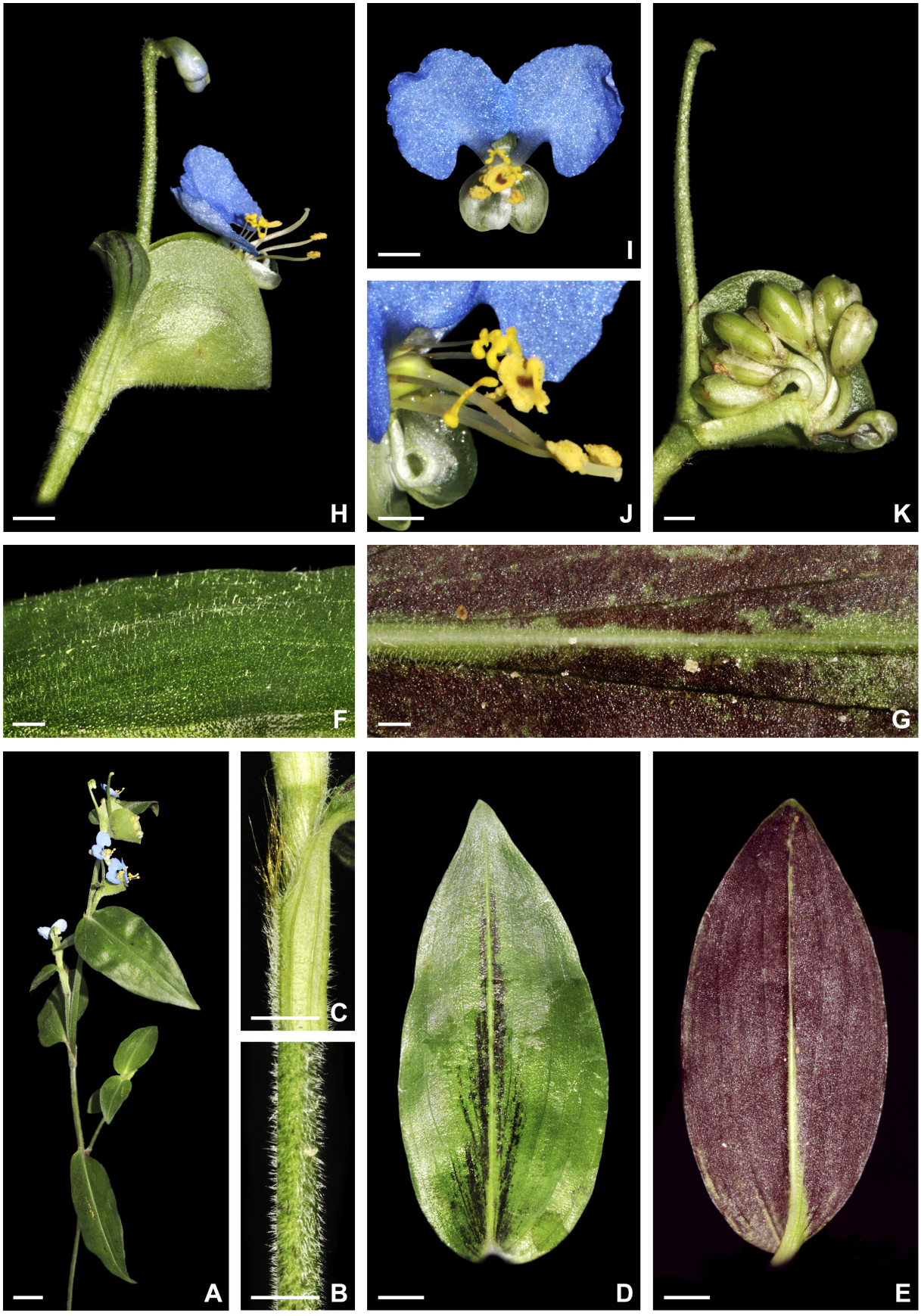
Selected material examined

BRAZIL – **Rio de Janeiro** • Itatiaia, Parque Nacional do Itatiaia, parte baixa, atrás da casa do pesquisador; 24 Jan. 2012; fl.; *M.O.O. Pellegrini & L.S. Sylvestre 188*; RB. – **São Paulo** • São Paulo, Parque do Estado, grounds of the Instituto de Botânica, 9.8 km south and 0.8 km east of center of São Paulo, Praça de Sé; 25 Mar. 1961; fl., fr.; *G.S. Eiten & L.T. Eiten 2748*; MO, NY, SPF.

Description

Herbs 20–50 cm tall, erect, perennial, delicate, rupicolous or terrestrial. *Roots* fibrous, thin. *Rhizome* short. *Stems* monomorphic, suberect to erect throughout, unbranched or branched only at base; internodes 1.2–12.4 cm long, distally shorter, green to dark green, sometimes speckled or longitudinally striated with vinaceous to dark purple, velutine to hispid, hairs acicular, light brown to brown. *Leaves* distichously-alternate, evenly distributed along the stem to slightly congested at the apex of the stem, pseudopetiolate; sheaths 0.3–1.8 cm long, light green, longitudinally striated with dark green, sometimes speckled or with vinaceous to dark purple, velutine to hispid, hairs acicular, light brown to brown, margin upright, hispid, hairs acicular, light brown to brown; pseudopetiole inconspicuous to up to 4.6 mm long; blades 1.1–7.8 × 0.8–2.7 cm, lanceolate to ovate, straight, membranous to thinly chartaceous, adaxially dark green, sometimes speckled or longitudinally striated with longitudinal vinaceous to dark purple, abaxially light green speckled with vinaceous to dark purple to completely vinaceous to dark purple, adaxially velutine to densely velutine, abaxially velutine to hispid, base asymmetric, cuneate, margin flat, scabrid, apex obtuse to acute; midvein conspicuous, adaxially impressed, abaxially prominently obtuse, secondary veins 3–4 pairs, adaxially conspicuous, abaxially inconspicuous, becoming conspicuous on both sides when dry. *Synflorescence* composed of a solitary main florescence or main florescence plus 1–3 co-florescences, restricted to the apex of the stems. *Inflorescences* terminal or apparently so, peduncle 0.3–0.9 cm long, shorter than ½ length of the spathe, straight, velutine to hispid with a mixture of acicular and hook-hairs,

Fig. 21 (next page). *Commelina vestita* Seub.; *M.O.O. Pellegrini & L.S. Sylvestre 188*, RB). **A**. Habit. **B**. Stem. **C**. Leaf-sheath. **D–G**. Leaf. **D**. Adaxial side of the blade. **E**. Abaxial side of the blade. **F**. Detail of the indumentum on the adaxial side of the blade. **G**. Detail of the indumentum on the abaxial side of the blade. **H**. Inflorescence. **I–J**. Flower. **I**. Front view of a staminate flower. **J**. Close-up of a bisexual flower showing the androecium and the gynoecium. **K**. Inflorescence with the spathe cut in half showing immature fruits. All photos by M.O.O. Pellegrini. Scale bars: A = 1 cm; B–E = 5 mm; F–G = 1 mm; H–I = 3 mm, J = 1.5 mm; K = 4 mm.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hairs hyaline; spathe 0.9–2.1 × 1.5–3.2 cm, cordate to widely cordate, rarely depressed ovate, patent to the peduncle, concolourous with the leaves, internally conspicuously mucilaginous, base connate up to mid-length, truncate to subcordate, externally velutine to hispid, hairs acicular to setose, hyaline, internally sparsely velutine, hairs acicular, hyaline, margin flat, apex obtuse to acute, straight, veins 4–5 pairs, inconspicuous, becoming conspicuous when dry; upper cincinnus developed, 2–8-flowered, flowers mainly staminate, sometimes bisexual, peduncle 1.5–2.9 cm long, exserted, J-shaped to decurved at pre-anthesis, gently decurved at anthesis, post-anthesis and fruit, densely puberulous with minute hook-hairs, hairs hyaline; lower cincinnus 7–10-flowered, flowers mainly bisexual, sometimes staminate, peduncle 0.6–1.3 cm long, thickened in fruit, puberulous with minute hook-hairs. *Flowers* chasmogamous, strongly zygomorphic, enantiostylous (style dislocated to the opposite side to the medial stamen); floral buds 2.4–6.5 × 2.1–6.3 mm, obovoid, light green or light blue, glabrous; pedicel 2.6–6.2 mm long, deflexed in bud and at anthesis, reflexed and elongating in fruit, light green, glabrous; sepals hyaline, persistent and accrescent in fruit, dorsal sepal 3.1–5.2 × 2.3–3.6 mm, elliptic to ovate, concave, glabrous, apex acute, lower sepals 3.9–5.8 × 3–4.2 mm, shortly-clawed, connate up to mid-length, oblique-obovate to widely oblique-obovate, concave, glabrous, apex obtuse; paired petals 0.6–1.2 × 0.6–0.9 cm, clawed, claw 2.9–4.9 mm long, sky blue, limb 5.4–8.7 × 5.7–9.2 mm, ovate-reniform to widely ovate-reniform, sky blue, base asymmetric, cordate to sagittate, apex round to slightly emarginate, medial petal 6.3–8.7 × 0.8–1.3 mm, sessile, oblong to spathulate, entire, apex slightly involute, discolourous with the paired petals, white, hyaline, glabrous on both sides, apex obtuse; staminodes 3, medial staminode equal to the laterals, filaments 3.1–5.7 mm long, straight to arcuate-recurved, white, base tan-coloured, antherodes 0.5–1.2 × 1–1.6 mm, X-shaped, yellow, minute pollen sacs between the upper and lower lobes present, non-polliniferous or producing very few grains, apiculate between the upper lobes, upper lobes conspicuous, spathulate, shorter than the lower, lower lobes spathulate; lateral filaments 6.2–9.6 mm long, almost straight to very gently sigmoid, apex gently recurved, tan-coloured, base white, apex pale brownish-mauve, anthers 1.2–1.5 × 0.6–0.9 mm, held near the stigma, elliptic to ovate, pale orange-yellow to pale apricot connective pale orange-yellow to pale apricot, pollen yellowish-orange to cream-orange, drying orange-yellow to pale apricot; medial filament 3.1–5.7 mm long, straight to arcuate-recurved, apex gently recurved, tan-coloured, base white, apex pale brownish-mauve, anther 1.3–2 × 0.9–1.5 mm, held near the antherodes, widely oblong to widely elliptic, slightly curved, pale orange-yellow to pale apricot, connective shield-shaped, pale orange-yellow to pale apricot, with a vinaceous to atro-vinaceous spot at centre, anther sacs not appressed to each other, pollen yellowish-orange to cream-orange, drying orange-yellow to pale apricot; ovary 1.1–1.7 × 0.7–1.2 mm, 3-carpellate, 5-ovulate, ellipsoid to widely ellipsoid, green, smooth, glabrous, style 5.6–8.5 mm long, equalling or slightly exceeding the stamens, almost straight to very gently sigmoid, apex gently recurved, base cylindric, tan-coloured, base white, apex pale brownish-mauve, deciduous in fruit, stigma trilobate, white to tan-coloured. *Capsules* 6–9 per spathe, 4.5–6.7 × 2.7–4.5 mm, obovoid, sessile, fruit wall thin, apex truncate, constricted between the seeds, tan-coloured when mature, shiny, smooth, 3-locular, unequally 2-valved, dorsal locule 1-seeded, indehiscent, ventral locules 2-seeded, dehiscent, valves splitting to the base. *Seeds* dimorphic, brown to dark brown; dorsal locule seed 3.1–4.9 × 1.4–2.4 mm, adnate to the fruit wall, ellipsoid, dorsiventrally compressed, ventrally flattened, slightly cleft towards the embryotega, testa foveolate, non-farinose, embryotega semilateral, inconspicuous, with a prominent apicule, hilum linear, ca ½ the length of the seed, on a weak ridge; ventral locule seeds 2.1–3.3 × 1.3–2.2 mm, free from the fruit wall, ellipsoid to reniform, truncate at one end, ventrally flattened, not cleft towards the embryotega, testa rugose-foveolate, sparsely farinose, farinae white, embryotega semilateral, conspicuous, with a prominent apicule, hilum curved, ca ½ the length of the seed, on a weak ridge.

Distribution

Commelina vestita is endemic to Southeastern Brazil, currently known for the States of Rio de Janeiro and São Paulo (Fig. 15). Seubert (1855) cites the type specimen as having been collected in southern Brazil (i.e., Brasilia meridionali). This led Hassemer (2017a) to incorrectly assume this represented

Brazil's current Southern political region (i.e., States of Parana, Rio Grande do Sul and Santa Catarina). However, when Sellow did fieldwork in Brazil (1814–1831), the State of Parana did not exist and used to be included in the State of São Paulo, while the States of Rio Grande do Sul and Santa Catarina had different and narrower boundaries when compared to their current delimitation. Thus, it is most likely that the type specimen was collected by Sellow in the area currently representing the State of São Paulo.

Ecology

It grows in the understory of secondary rainforests (Atlantic Forest biome), between 800–1000 m a.s.l.

Phenology

It was found in bloom and fruit from October to December. The flowers open during the morning (around 10:00 AM) and remain open for just a few hours, depending on the temperature and humidity. Floral visitors were not observed in the field and cultivation, but fruits were consistently produced. This suggests *C. vestita* is self-compatible, which is also supported by its lateral anthers held near or touching the stigma, enabling self-pollination (Pellegrini, pers. obs.). Furthermore, despite no floral visitors having been observed visiting the flowers of *C. vestita* (both in the wild and in cultivation), fruit production is between 90% and 100% in cultivation (Pellegrini, pers. obs.).

Sexual reproduction seems to be the species' primary reproductive strategy. This seems to be supported by their erect growth form and short rhizome, which makes them less likely to reproduce clonally. Broken or bent stems are able to root and form new individuals, but this is very uncommon in the wild (Pellegrini pers. obs.). However, fruits and seed sets are very high and seem to ensure populational stability (Pellegrini, pers. obs.).

Vernacular names

Trapoeraba cabeluda (Brazil), andacá peludo (Brazil), manobi-ába (Brazil), andacá-ába (Brazil), Anda ka'a aba (Brazil – Guarani).

Uses

Used in traditional medicine in Brazil for its diuretic and emollient properties (Pellegrini, pers. obs.).

Conservation

Commelina vestita presents a wide EOO (53 133 km^2) but a narrow AOO (ca 284 km^2). Its known populations are significantly small, consisting of less than 20 mature individuals. These populations do seem to be surprisingly stable if undisturbed (Pellegrini, pers. obs.). However, *C. vestita* has been recorded growing exclusively in secondary forests and other environments under intense anthropic pressure. Some of the observed populations were greatly affected or extinct as a result of a steep decline in environmental quality. Thus, following the IUCN (2012) criteria and the IUCN Standards and Petitions Committee (2024) recommendations, we suggest *C. vestita* should be considered Endangered [EN, B2b(ii, iii, iv, v) c(iv)+C2a(i),b].

Nomenclatural remarks

The specimen at B cited by Seubert (1855) has been apparently destroyed during WWII (Robert Vogt, pers. comm.). Nonetheless, we have been able to locate a duplicate at BR, which most likely represents the specimen analysed by Clarke (1881) for his monograph on Commelinaceae. The specimen at BR is in perfect condition, and since it matches the protologue, it is designated here as the lectotype.

Remarks

Hassemer (2017a) stated *C. vestita* to be a name of dubious application. Nonetheless, the protologue is far from being "not informative enough", as stated by the author. It describes the vegetative organs and the inflorescence as presenting a very characteristic velutine to hispid pubescence, not found in any other species of *Commelina* from Brazil. Furthermore, Seubert (1855) compares his new species with *C. robusta*, stating that both species have very similar flowers and identical fruits and seeds. The only issue in Seubert's description is where he states that *C. vestita* has an aborted [sic] upper cincinnus.

After analysing the type at BR, it became clear that this was incorrect. One of the upper cincinni in the type specimen even presents open flowers and floral buds. Furthermore, based on the analysed herbarium specimens and plants kept in cultivation, the upper cincinnus of *C. vestita* is always many-flowered, much like in *C. robusta*. Therefore, *C. vestita* is morphologically most similar to *C. robusta* due to their gross morphology, involute and entire medial petal, ovary and capsules smooth, dorsal seed with testa rugose-foveolate, and ventral seeds white-farinose. They can be differentiated based on their stature (delicate and up to 50 cm tall in *C. vestita* vs robust and up to 2 m tall in *C. robusta*), stem posture and branching (erect, unbranched to branched at base vs prostrate, ascending or scrambling, sometimes erect, branched throughout or branched in the upper third), indumentum of the vegetative organs and inflorescences (stems velutine to hispid; leaf-sheath margin with light brown to brown hairs spathe externally velutine to hispid, internally sparsely velutine, margin glabrous vs stems scabrid to glabrous, leaf-sheath margin with red to dark red to atro-vinaceous hairs, spathe glabrous on both sides, margin setose near the base), the abaxial colouration of the leaf-blades (completely to only speckled with vinaceous to dark purple vs light green), the shape of the dorsal sepal (elliptic to ovate vs triangular to widely triangular), the shape of the limb of the paired petals (ovate-reniform to widely ovate-reniform vs very widely ovate-reniform to depressed ovate-reniform), the shape, colouration and posture of the medial petal (oblong to oblanceolate, white, apex involute vs spathulate to obovate, light blue to pale lilac, completely involute), antherode morphology (apiculate between the upper lobes, upper lobes shorter than the lower ones vs not apiculate between the upper lobes, upper lobes equal to the lower ones), anther colouration and position (pale orange-yellow to pale apricot, lateral anthers held near the stigma, medial anther held near the antherodes vs orange-yellow to orange, lateral anthers held near the medial anther), and the posture of the style (almost straight to very gently sigmoid vs sigmoid, apex strongly recurved) (Table 2).

Misapplied or dubious Neotropical names

Commelina congestispatha López-Ferr., Espejo & Ceja

Commelina congestispatha López-Ferr., Espejo & Ceja (López-Ferrari *et al.* 2009: 72–75, fig. 1).

Etymology

The epithet derives from the combination of the Latin '*congestī*' (meaning 'clustered, together') + the Ancient Greek '*σπάθη*' (*spáthē*, meaning 'any broad blade'), in reference to this species' very dense synflorescences composed of several spathes (i.e., inflorescences).

Type material

MEXICO – **Guanajuato** • Cuerámaro, 1.2 km después de Canãda de Corralejo, rumbo a la barranca de El Chilar; 4 Sep. 2006; fl., fr.; *A. Espejo et al. 6903*; lectotype: UAMIZ [UAMIZ0068668]!, **designated here**; isolectotypes: CIIDIR n.v., IBUG n.v., IEB [IEB0233919]!, QMEX n.v., UAMIZ [UAMIZ0068663]!, [UAMIZ0068671]!, UJAT n.v.

Remarks

Commelina congestispatha has been recently reduced to a synonym of *C. robusta* (as *C. obliqua*; Hassemer 2019). Despite the plant's gross morphology resembling *C. robusta*, *C. congestispatha* is indisputably more closely related to *C. erecta* due to its auriculate leaf-sheaths, leaf-blades with red to vinaceous margin, vestigial and flowerless upper cincinnus, lower sepals completely connate and cup-shaped, hyaline and involute medial petal, capsules with verrucose dorsal valve, and appendaged seeds with smooth testa (Lopez-Ferrari *et al.* 2009; Pellegrini, pers. obs.). Nonetheless, the number of inflorescences congested at the stems' apex [i.e., 3–10 florescences per synflorescence *C. congestispatha* vs 1(–3) in *C. erecta*], the posture of the paired petals (in an obtuse angle to almost in the same plane to each other vs in an acute angle to each other, commonly partially overlapping), the length of the paired petals' claw (1–1.5 mm vs 3–8.5 mm long), the length of the paired petals' limb (6.7–7.2 mm long vs 11–23 mm long), and the shape of the antherodes (lobes subrotund vs spathulate) undoubtedly supports both species as distinct. Thus, we reestablish *C. congestispatha* as a Mexican endemic, closely related to *C. erecta*.

Commelina diffusa* var. *cordispatha Rohweder

Commelina diffusa var. *cordispatha* Rohweder (Rohweder 1956: 159). **Syn**. **nov**.

Etymology

The epithet derives from the combination of the Latin genitive '*cordis*' (meaning 'heart') + the Ancient Greek '*σπάθη*' (*spáthē*, meaning 'any broad blade'), in reference to this species' cordate spathes.

Type material

EL SALVADOR – **Chalatenango** • Weg Hda. Sta. Cruz, "La Laguna", near Chalatenango; 700 m a.s.l.; 25 Nov. 1950; fl., fr.; *O. Rohweder 882*; lectotype: HBG [HBG-514345]!, designated by Hassemer (2020); isolectotypes HBG [HBG-514346, HBG-514347]!.

Accepted species

Commelina tuberosa L.

Remarks

Commelina diffusa var. *cordispatha* Rohweder was erroneously considered by Hassemer (2020) as a synonym of *C. texcocana*. However, no rationale was provided, and based on the analysis of the type specimens and protologue, this cannot be sustained. *Commelina diffusa* var. *cordispatha* clearly presents an ascending to erect habit, which prevents it from being associated with *C. texcocana* or *C. pallida*. Furthermore, fruit and seed morphology does not match these species, further distancing it from these species. Nonetheless, this name does fit perfectly into Hassemer's (2020) own very broad and all-encompassing circumscription of *C. tuberosa* s. lat. Due to the massive number of names officially and unofficially associated with the *C. tuberosa* species complex, we choose to take a conservative approach and tentatively place it under the synonymy of *C. tuberosa* s. lat. until further studies are carried out.

Commelina guyanensis Klotzsch ex Seub.

Commelina guyanensis Klotzsch ex Seub. (Seubert in Martius 1855: 262). – *Commelina guianensis* Klotzsch (Klotzsch in Schomburgk 1849: 1064), nom. not effectively published. **Syn**. **nov**.

Type material

GUYANA • s.loc., In swampy areas of the savannah and on the banks of rivers; s.dat.; fl.; *M.R. Schomburgk 387*; neotype: P [P01795521]!, **designated here**.

Accepted species

Commelina diffusa Burm.f.

Nomenclatural remarks

No specimens were cited by either Klotzsch (Schomburgk 1849) or Martius (1855). However, while visiting the P herbarium, we came across a specimen (P01795521) that perfectly matches the diagnoses provided by both authors. Furthermore, the label is from the same expedition as P00752552, which is annotated as being the type of *C. platyphylla* Klotzsch ex Seub., which shares the same publication record as *C. guyanensis*. Therefore, we designate this specimen as the neotype for *C. guyanensis*, also fixing its application as conspecific with *C. diffusa*.

Remarks

Commelina guyanensis Klotzsch ex Seub. has been traditionally regarded as a synonym of *C. rufipes*. Klotzsch's original description (Schomburgk 1849) was done solely in German, lacking a Latin diagnosis or description, making the name not effectively published. However, the German diagnosis described the species as a perennial herb growing on swampy savannah and riverbanks, which prevents it from being conspecific with *C. rufipes* (a species from the non-flooded understory of rainforests). Later, Martius (1855) finally provided a Latin diagnosis, which characterised the species as having glabrous stems, leaf-sheaths margin setose with light brown hairs, leaf-blades lanceolate with acuminate apex and vinaceous veins, inflorescences subterminal and "short-pedunculate" [sic], spathe conduplicate (i.e., base free), "pedicels 2" (i.e., with 2 developed cincinni) with the upper one hirtellous and "sterile" [sic], capsules glabrous, and seeds free. These characters make it impossible for this name to represent a synonym of *C. obliqua*, let alone *C. rufipes*. However, both diagnoses confidently place the species in the *C. diffusa* group. As aforementioned, the selected neotype is conspecific with the current circumscription of *C. diffusa*. Thus, this name is excluded from the synonymy of *C. rufipes* and placed under the synonymy of *C. diffusa*.

Commelina mathewsii (C.B.Clarke) Faden & D.R.Hunt

Commelina mathewsii (C.B.Clarke) Faden & D.R.Hunt (Faden & Hunt 1987: 122). – *Phaeosphaerion mathewsii* C.B.Clarke (Clarke 1881: 138), as "Matthewsii". – *Athyrocarpus mathewsii* (C.B.Clarke) Kuntze (Kuntze 1898: 319).

Etymology

Named after the collector of the type specimen, British gardener Andrew Mathews.

Type material

PERU – **Huánuco** • Cassapi; 1840; fl.; *A. Mathews 148*; lectotype: K [K000363242]!, designated by Faden & Hunt (1987).

Distribution

If distinct from *C. robusta*, then extending from northeastern Bolivia up to southeastern Peru, along the Andes.

Remarks

Commelina mathewsii has been a taxonomically dubious name since its description (Clarke 1881: 138). It was initially placed in the genus *Phaeosphaerion* despite the fact that the only known collection having only flowers and no fruits. Clarke based his decision on the flowers presenting "hastate-triangular" antherodes. The type specimen does seem morphologically similar to *C. robusta* due to gross morphology and *C. rufipes* due to its peculiar villose leaf-blade pubescence. Nonetheless, the label does not specify flower colour, nor does the specimen allow for that to be confirmed due to its poor preservation. Based on a handful of similar-looking specimens from Bolivia and Peru, it seems that leaf-blade pubescence is constant in these specimens, that flowers are blue and not white as in *C. rufipes*, and that fruits are dehiscent tan-coloured capsules. These characters, combined with leaf-blade pubescence and the antherode shape, would support *C. mathewsii* as a distinct species. Thus, *C. mathewsii* is most likely distinct but closely related to *C. robusta*. However, since we haven't been able to study fresh specimens or herbarium ones with well-preserved flowers, we choose to retain this species as a dubious name instead of treating it as distinct or a synonym of *C. robusta*.

Commelina pallida* var. *parviflora Pav. ex C.B.Clarke.

Commelina pallida var. *parviflora* Pav. ex C.B.Clarke (Clarke 1881: 151). **Syn**. **nov**.

Etymology

From the Latin '*parvus*' (meaning 'small') + '*flora*' (meaning 'flower'), in reference to its small flowers.

Type material

MEXICO • s.loc.; s.dat.; fl., fr.; *J.A. Pavón s.n.*; lectotype: BM [BM000938212]!, designated by Hassemer (2020); isolectotypes: BM [BM000938207, BM000938208, BM000938210, BM000938211]!.

Accepted species

Commelina tuberosa L.

Remarks

Commelina pallida var. *parviflora* was quickly reduced to a synonym after its publication, adding to the taxonomic confusion of this broadly circumscribed species. However, this taxon presents well-developed and flower-bearing upper cincinnus, which prevents it from being conspecific to either *C. pallida* or *C. texcocana*. Morphologically, it seems to be a member of the *C. tuberosa* species complex. However, we consider it premature to reestablish this name as accepted in the present study before all names and species from this very complex group are appropriately studied. Thus, we tentatively place it under the synonymy of *C. tuberosa* s. lat.

Commelina persicariifolia Redouté

Commelina persicariifolia Redouté (Redouté 1815: pl. 472). – *Phaeosphaerion persicariifolium* (Redouté) C.B.Clarke (Clarke 1881: 137). – *Phaeosphaerion persicariifolium* (Redouté) C.B.Clarke var. *persicariifolium* (Clarke 1881: 137). – *Athyrocarpus persicariifolius* (Redouté) Hemsl. (Hemsley 1885: 386). – *Commelinopsis persicariifolia* (Redouté) Pichon (Pichon 1946: 227).

Commelina quitensis Benth. (Bentham 1846: 258). – **Type:** ECUADOR – **Pichincha** • Puente de Guapulo prope Quito; alt. 8000 ft.; s.dat.; fl., fr.; *K.T. Hartweg 1439*; lectotype: K [K000531988]!, designated by Hassemer (2018b); isolectotypes: K [K000531987]!, LD [LD1221669]!. **Syn**. **nov**.

Etymology

From the Latin '*persicarius*' (meaning 'peach tree') + '*folia*' (meaning 'leaf'), in reference to its leaves being similar to those of the genus *Persicaria* Mill. (Polygonaceae), which was named after its leaves, which look similar to those of peach trees [*Prunus persica* (L.) Batsch, Rosaceae].

Type material

Original illustration of Les Liliacées at the W. Graham Arader Gallery and later published in Redouté 1815: pl. 472; lectotype, **designated here**.

Remarks

Commelina persicariifolia was cultivated in the gardens of the Muséum d'Histoire naturelle Paris (Redouté 1815). However, the author states not knowing where the plant was originally collected. After analysing the protologue and original illustration of *C. persicariifolia* Redouté, it became clear that this species does not represent a synonym of *C. rufipes* nor of *C. obliqua* as it has been widely accepted for the past 200 years or so.

Redouté (1815) describes his new species as presenting cordate spathe and flowers with subequal, light blue to lilac petals, which would place this species near the *C. diffusa* or *C. tuberosa* groups. Redouté (1815) describes the inflorescences as presenting very short peduncles, which is also shown in the original illustration (Redouté 1815: pl. 472). Furthermore, the illustration shows the inflorescences being produced in an apparently terminal position. These inflorescence characters could suggest *C. persicariifolia* to be a member of any of the *C. benghalensis*, *C. erecta*, *C. robusta*, or *C. tuberosa* groups. The association with the *C. robusta* group was previously made by Hunt (1981) and Faden & Hunt (1987), but no rationale was provided. Nonetheless, all species in this group have unequal petals, which also applies to the *C. benghalensis* and *C. erecta* groups.

Another peculiarity in the original illustration of *C. persicariifolia* is that the leaves are spirally-alternate, a very rare feature in the genus that has been greatly overlooked. This peculiar character gave us the needed information to ascertain this name's identity and application. After analysing the type of *C. quitensis*, we noticed that the leaves are also spirally-alternate, which is shared with some other members of the *C. tuberosa* group. The very short peduncle could merely be an optical artefact of the angle illustrated by Redouté (1815: pl. 472). Furthermore, Redouté (1815) provides no measurement for the length of the peduncle, making "short" and "long" very relative terms. Regardless, the type specimens of *C. quitensis* present comparatively short peduncles in regard to the many species of the *C. tuberosa* group. Furthermore, the inflorescences are mostly leaf-opposed, but an apparently terminal inflorescence is also observed in the illustration. This feature is shared with several species of the *C. tuberosa* group but absent in the *C. diffusa* group.

Of the 17 species currently recognised in the *C. tuberosa* group, *C. quitensis* is by far the best match. Both species share erect, branched and glabrous stems, spirally-alternate pseudopetiolate leaves, leaf-sheaths with setose margins, a combination of leaf-opposed and apparently terminal inflorescences with short peduncles, cordate spathe with free base, developed and exserted but generally flowerless upper cincinnus, green and opaque free sepals, light blue to lilac flowers, and the shortly-clawed medial petal. Based on the aforementioned characters, we consider *C. persicariifolia* and *C. quitensis* to be conspecific. Since *C. persicariifolia* has priority over *C. quitensis*, it is treated as the correct name for this taxon, with *C. quitensis* reduced to a synonym.

Commelina rubens Redouté

Commelina rubens Redouté (Redouté 1813: pl. 367).

Etymology

From the Latin '*rubēns*' (meaning 'red'), in reference to its red to vinaceous stems and leaf-sheaths.

Type material

Original illustration of Les Liliacées at the W. Graham Arader Gallery and later published in Redouté 1813: pl. 367; lectotype, **designated here**.

Remarks

Commelina rubens has previously been compared with *C. pallida*. It has also been erroneously considered to have been validly published by Kunth (1843: 659) (e.g., Tropicos.org 2025) or as not validly published at all (i.e., Hassemer 2020). As stated by Hassemer (2020), Kunth merely cites *C. rubens* as similar to *C. stricta* Desf., and thus the author deemed "*C. rubens* Hort. Berol. ex Kunth" as not validly published (Turland *et al.* 2018: Art. 36.1). Nonetheless, after much research, we were able to find this name to have been validly published by Redouté (1813). The protologue and original illustration (Redouté 1813: pl. 367) describe a species superficially similar to *C. diffusa* due to its procumbent stems, leaf-opposite inflorescences, spathe base free, subequal blue petals, and yellow antherodes and anthers. However, the inflorescence is described as having a single cincinnus, as shown in the illustration (Redouté 1813: pl. 367), making it impossible to represent *C. diffusa* or any Neotropical members of this species group. Other distinguishing features are the spirally-alternate leaves, very short inflorescence peduncle and the shape of the spathe (i.e., lanceolate, falcate, base subcordate to obtuse), the concave subequal petals, added to the hispid stems, leaf-sheaths and abaxially hispid leaf-blades. These combined characters strongly suggest this species belongs to the *C. tuberosa* group and is closely related to the also poorly understood *C. persicariifolia*. Both species are clearly distinct from *C. tuberosa* s. str. and are here reestablished as accepted.

Commelina rubens was also cultivated in the gardens of the Muséum d'Histoire naturelle Paris (Redouté 1813). However, the author states not knowing where the plant was originally collected. Similar to *C. persicariifolia*, we believe this plant most likely originated from Ecuador, based on our studies of the *C. tuberosa* group specimens from the region. The original illustration is here designated as the lectotype for this name, and we refrain from designating any epitypes at this moment before we have been able to analyse the members of the *C. tuberosa* group more carefully.

Misapplied Palaeotropical names

Commelina communis Roxb.

Commelina communis Roxb. (Roxbugh in Carey & Wallich 1820: 175), nom. not effectively published, non *C. communis* L. **Syn**. **nov**.

Accepted species

Commelina paludosa Blume.

Remarks

This name was never actually published since Roxburgh cites it as "C. *communis. Linn. Sp. Pl. ed. Willd.* 1. 249.", making it clear he was applying Linnaeus's name, regardless of whether it was correctly applied

or not. *Commelina communis* L. does not occur in India and seems to represent a misapplication to the species known as *C. paludosa* Blume, which Clarke (1881) treated as a synonym of his interpretation of *C. obliqua* (which equates to our current use of *C. robusta*). *Commelina paludosa* is morphologically very similar to the Neotropical *C. scabrata* but can be differentiated by its scrambling habit, sessile and free lower sepals, lilac or white paired petals with limb base cordate, antherode lobes oblanceolate to spathulate, capsules widely obovoid, smooth and 3-valved, each locule 1-seeded, and seeds with smooth testa.

Commelina obliqua Buch.-Ham. ex D.Don

Commelina obliqua Buch.-Ham. ex D.Don (Don 1825: 45), nom. illeg., non *C. obliqua* Vahl. – *Heterocarpus obliquus* Hassk. (Hasskarl 1870: 7). **Syn**. **nov**.

Accepted species

Commelina paludosa Blume.

Remarks

Commelina obliqua Buch.-Ham. ex D.Don represents a posterior homonym to *C. obliqua* Vahl and is thus illegitimate. This name also seems to represent the source of the historical association of *C. obliqua* Vahl with the taxon correctly named *C. robusta*. The Palaeotropical *C. obliqua* Buch.-Ham. ex D.Don (= *C. paludosa*) is indeed a member of the *C. robusta* group and very similar to *C. scabrata*. Alternatively, *C. obliqua* Vahl actually represents the correct name for the Neotropical taxon that has so far been treated as *C. rufipes* var. *glabrata* (see Remarks for *C. obliqua* Vahl). Regarding the correct author of *Heterocarpus obliquus*, since *C. obliqua* Buch.-Ham. ex D.Don is illegitimate, and illegitimate names cannot be combined (Turland *et al.* 2018: Art. 6.10). Thus, *H. obliquus* represents a replacement name (i.e., a new name) for this taxon under *Heterocarpus*, with the correct author citation being "Hassk.".

Commelina obliqua* f. *albiflora Hochr.

Commelina obliqua f. *albiflora* Hochr. (Hochreutiner 1925: 320). **Syn**. **nov**.

Type material

INDONESIA – **Java** • Mt. Guedeh, Tjipanas, à côté de la source chaude; 22 Apr. 1904; fl.; *B.P.G. Hochreutiner 1050*; holotype: G n.v.

Accepted species

Commelina paludosa Blume.

Remarks

Commelina obliqua f. *albiflora* was described under the illegitimate *Commelina obliqua* Buch.-Ham. ex D.Don for the white-flowered individuals of what we currently understand as *C. paludosa*. Given that colour variation is shown here to be very common in *Commelina*, we propose this name should be treated only as a synonym.

Commelina polyspatha Wight

Commelina polyspatha Wight (Wight 1853: pl. 2066). – *Trithyrocarpus polyspatha* (Wight) Hassk. (Hasskarl 1866: 211), **Syn**. **nov**.

Type material

INDIA – **Bolamputty Mountains** • near Coimbatore; Nov. 1852; fl., fr.; *R. Wight s.n.*; lectotype: K [K000794525]!, **designated here**; isolectotype: K [K000794526]! pro parte, material on the upper half of the sheet.

Accepted species

Commelina paludosa Blume.

Remarks

Commelina polyspatha represents a synonym of the Asian *C. paludosa* and is thus excluded from the Neotropical gem-fruited species. As aforementioned, this species presents a vestigial and flowerless upper cincinnus, capsules 3-valved, with 1-seeded locules, seeds with smooth testa, embryotega lateral, and hilum curved. These characters make it very similar to *C. scabrata*, which, aside from the obvious intercontinental disjunction, can be differentiated by its paired petals limb with a cuneate base and white claw, antherodes with upper lobes very widely obovate and larger than the lower, lower lobes widely oblong to subquadrangular, unequally 2-valved prismatic capsules with verrucose walls, and seeds with ornate testa. Nonetheless, we have yet to be able to confirm if the capsules of *C. paludosa* (as well as the closely related *C. maculata* Edgew.) also present ventral valves that only split up to mid-length. Further studies are necessary to elucidate the relationship and morphological differences between the Palaeotropical *C. maculata* and *C. paludosa* and the Neotropical *C. bambusifolia* and *C. scabrata*.

Commelina semiovata Buch.-Ham. ex Wall.

Commelina semiovata Buch.-Ham. ex Wall. (Wallich 1848: 8985), nom. not effectively published. **Syn**. **nov**.

Accepted species

Commelina paludosa Blume.

Remarks

Commelina semiovata also represents a synonym of the Asian *C. paludosa* and is thus excluded from the Neotropical gem-fruited species. The confusion also seems to be rooted in the use of the posterior synonym *C. obliqua* Buch.-Ham. ex D.Don.

Discussion

The gem-fruited species have historically been associated with each other due to their conspicuous fruits, even though they represent a non-monophyletic group (Faden & Hunt 1987; Pellegrini *et al.* in prep.). Nonetheless, some species in this artificial assembly form morphologically cohesive groupings, which are recovered as part of phylogenetically supported clades (Pellegrini *et al.* in prep.). Six morphological groups, supported by molecular and morphological data, can be recognised in the Neotropics: 1) the *C. benghalensis* group; 2) the *C. diffusa* group; 3) the *C. erecta* group; 4) the *C. platyphylla* group; 5) the *C. robusta* group; and 6) the *C. tuberosa* group. Out of these, only the *C. platyphylla* and *C. tuberosa* groups are exclusively Neotropical. The other four groups, which include Neotropical species, are composed of a mixture of both Neotropical and Palaeotropical species.

Commelina obliqua, *C. pseudomonosperma*, and *C. rufipes* are closely related to each other. However, ongoing molecular studies support their being more closely related to *C. benghalensis* L. than to the *C. robusta* group (with which they have traditionally been associated; Pellegrini *et al.* in prep.). Thus, in

the Neotropics, the *C. benghalensis* group includes *C. benghalensis*, *C. obliqua*, *C. pseudomonosperma* and *C. rufipes*, being characterised by its perennial habit, fibrous roots, stems prostrate to ascending, inflorescences short-pedunculate and apparently terminal, with the spathe at least basally connate, developed and flowered upper cincinnus, small flowers, medial petal unequal and much smaller than but concolourous with the laterals, capsules with 2-seeded ventral locules, and seeds variously ornate.

The *C. diffusa* group includes *C. caroliniana* Walter, *C. communis*, *C. diffusa*, *C. gigas* Small, and *C. longicaulis* Jacq., and is characterised by its annual or short-lived habit, fibrous roots, stems prostrate to ascending, long-pedunculate and leaf-opposed inflorescences, spathe base free, upper cincinnus developed and flowered, lower sepals sessile, free and hyaline, petals generally subequal, medial petal shortly-clawed, medial staminode generally present, hastate medial anther, capsules with 2-seeded ventral locules, and seeds variously reticulate. The *C. erecta* group represents a morphologically and phylogenetically cohesive assemblage based on their leaf-sheaths with patent auriculate margin, terminal or apparently terminal inflorescences, peduncle short, spathe base connate, upper cincinnus vestigial and flowerless, lower sepals sessile, completely connate and cup-shaped, capsules with 1-seeded ventral locules, testa smooth, and the presence of a lateral appendage on the seeds. It is currently represented in the Neotropics by *C. catharinensis* Hassemer, J.P.R.Ferreira, Funez & J.D.Medeiros, *C. congestispatha*, *C. dielsii* Herter, *C. erecta*, and *C. rebmanii* León-de-la-Luz. However, some names need to be urgently reassessed, and this number might increase in the near future.

The *C. platyphylla* group is represented solely by the morphologically unique South American *C. platyphylla*.

The *C. robusta* group is morphologically cohesive, as stated by Pellegrini & Forzza (2017), and ongoing molecular studies seem to support it as a monophyletic assemblage (Pellegrini *et al.* in prep.). It is represented in the Neotropics by *C. bambusifolia*, *C. huntii*, *C. robusta*, *C. scabrata*, *C. sugariae* sp. nov., *C. vestita*, and *C. virginica* L. This group can be characterised by its leaf-sheaths margin with light brown to brown or rusty to rusty-brown or red to dark red to atro-vinaceous hairs, synflorescences with many congested coflorescences, inflorescences terminal to apparently terminal and short-pedunculate, spathe base connate, lower sepals shortly-clawed and connate up to mid-length, anthers pale orange-yellow to pale apricot orange-yellow to orange to apricot, stigmas trilobate, capsules with 1–2-seeded ventral locules, and seeds variously ornate.

The *C. tuberosa* group is the largest group in the Neotropics, currently represented by *C. almandina* sp. nov., *C. bravoa* Matuda, *C. efoveolata*, *C. leiocarpa*, *C. nivea* López-Ferr., Espejo & Ceja, *C. occulta* D.Juárez, *C. pallida*, *C. persicariifolia*, *C. queretarensis* López-Ferr., Espejo & Ceja, *C. ramosissima* López-Ferr., Espejo & Ceja, *C. rubens*, *C. rzedowskii* López-Ferr., Espejo & Ceja, *C. scabra* Benth., *C. socorrogonzaleziae* Espejo & López-Ferr., *C. standleyi* Steyerm., *C. texcocana*, and the *C. tuberosa* species complex (which currently includes a list of around 30 heterotypic synonyms; POWO 2025). This group is characterised by its tuberous roots, which can be cylindric or fusiform, stems prostrate, ascending, erect, or vining, leaves generally spirally-alternate, long-pedunculate and leaf-opposed inflorescences, spathe base free (rarely connate), upper cincinnus generally vestigial and flowerless, sessile, free and opaque lower sepals, subequal petals, medial petal shortly-clawed, medial staminode generally aborted, capsules with 1–2-seeded ventral locules, and seeds variously ornate. By far, the *C. tuberosa* group is the most taxonomically complex and morphologically diverse. Its flowers show a wide range in colouration, with petals most commonly in different shades of blue, sometimes purple, lilac or white, rarely ranging from buff orange to apricot to orange-pink. Recent oversimplifications of the taxonomy of Neotropical *Commelina* (e.g., Hassemer 2017a, 2017b, 2018a, 2018b, 2019, 2020) have significantly affected this species group, with widely distributed species (e.g., *C. tuberosa*) currently circumscribed to include most of the group's morphological, ecological and geographical variation. Species in this group require

careful examination, associating herbarium specimens with field observations to propose reliable and stable taxonomic changes.

Conclusion

The present study reinforces the importance of several morphological characters previously used in the taxonomy of *Commelina*. Pedicel, sepal and petal pubescence have been significantly ignored in the taxonomy of *Commelina* due to being generally early-deciduous (especially the glandular microhairs) and the common misconception that the flowers of *Commelina* are entirely glabrous. Furthermore, we use and properly describe antherode morphology for the first time, showing that their development (i.e., presence or not of the medial antherode), colouration and shape are of taxonomic relevance. Recent studies on the Neotropical species of *Commelina* have heavily relied on the colouration of the paired petals for taxonomy. However, colour naming and identification greatly vary depending on individual perception, making them extremely hard to standardise. A great example is the different interpretations of colours ranging from purple to blue (which are the most common hues in *Commelina*) and pink (which is actually uncommon in the genus). These colours in Commelinaceae are produced by anthocyanins, which have their colouration greatly affected by changes in pH. Differences in colour perception by the observer, added to the colours being affected by the herborisation process, make petal colour unreliable when used as the sole character to differentiate species. Furthermore, colour plasticity in the petals is also shown in the present study to be fairly common in the genus.

Therefore, we urge botanists working with *Commelina* to also make use of, adequately describe, and illustrate other characters, such as: 1) root morphology; 2) rhizome morphology; 3) stem posture and growth pattern; 4) leaf-sheath morphology; 5) phyllotaxy; 6) presence of a pseudopetiole in the leaf-blades; 7) synflorescence architecture; 8) inflorescence position; 9) spathe morphology; 10) upper cincinnus development and flower production; 11) pedicel pubescence; 12) sepal morphology, connation and pubescence; 13) petal morphology, especially the shape of the paired petals and the development and pubescence of the medial petal; 14) filaments' posture at anthesis; 15) anthers and antherodes morphology and colouration; 16) gynoecium and fruit morphology, ornamentation and pubescence; 17) fruit dehiscence; and 18) seed morphology. These characters have either been previously shown to be useful (Faden 1993, 2008, 2012; Joseph & Nampy 2012, 2015; Pellegrini & Forzza 2017) or are here suggested for the first time as key to further the taxonomy of *Commelina*.

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