



Lepeostegeres cebuensis (Loranthaceae), a new mistletoe species from Cebu, Philippines

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Lepeostegeres cebuensis is described as a new species from Cebu Island, Philippines. It is unique among currently known species in the genus by having peculiar ridges of orange-brown scales on the young leaves and internodes. This discovery brings the total number of Philippine *Lepeostegeres* species to three. We consider *Lepeostegeres cebuensis* to be Data Deficient (DD) following the Red List Criteria of the International Union for the Conservation of Nature (IUCN).

Key words: Alcoy, Nug-as forest, parasitic plant, south Cebu, taxonomy

Introduction

Lepeostegeres Blume in Schultes & Schultes (1830: 1731; Loranthaceae) is a small mistletoe genus of nine species. It is endemic to Southeast Asia, from Peninsular Malaysia to New Guinea (Barlow 1997). This genus is morphologically similar to *Lepidaria* van Tieghem (1895: 439) and *Thaumasianthes* Danser (1933: 464) in having involucrate capitate inflorescences (Barlow 1997). However, whereas involucre bracts of the latter two genera either subtend individual flowers (*Lepidaria*) or each triad of flowers (*Thaumasianthes*), only the outermost triads of a *Lepeostegeres* inflorescence are subtended by an involucre bract (Danser 1933, Barlow 1993, 1997), giving it the appearance of a flower head of a member of the Asteraceae family.

Two species of *Lepeostegeres* have thus far been reported from the Philippines (Barlow 1997, Pelsner *et al.* 2011 onwards). *Lepeostegeres acutibracteus* Danser (1936: 56) is only known from Busuanga Island in Palawan Province. It is unique in *Lepeostegeres* by having sagitate involucre bracts. *Lepeostegeres congestiflorus* (Merrill 1909: 147) Merrill (1923: 101) is also endemic to the Philippines, but has a more widespread distribution. It is found from northern Luzon to southern Mindanao (Danser 1935). Danser (1935) reports that *L. congestiflorus* is different from other this genus species by having deciduous bracts and receptacles and pedicels that enlarge after flowering.

During fieldwork for the Co's Digital Flora of the Philippine project (Pelsner *et al.* 2011 onwards) in December 2015, a *Lepeostegeres* plant belonging to a third Philippine species was collected in Nug-as forest, Alcoy, Cebu. Morphological studies showed that this species is distinct from all presently known *Lepeostegeres* species in several characters that traditionally have been used for species delimitation in this genus. Assuming that these morphological differences are an indication of reproductive isolation, it is described here as a new species under a biological species concept (Mayr 2000). This new addition brings the total number of Philippine *Lepeostegeres* species to three.

Taxonomy

Lepeostegeres cebuensis Barcelona, Nickrent & Pelsner, *sp. nov.*—Fig. 1A–H

Type:—PHILIPPINES. Cebu Province: Alcoy Municipality, Barangay Nug-as, 17 Dec. 2015, *Barcelona 4175 with P.B. Pelsner & P. Villarta* (holotype: PNH!; isotypes: CAHUP!, CHR!, K!, L!, PUH!, US!).

Diagnosis:—*Lepeostegeres cebuensis* is unique among currently known species in the genus by the presence of ridges of brown scales on the leaf and petiole margins and abaxial side of the midvein of young leaves that are decurrent on the young internodes.

Description:—Aerial stem-parasitic shrub, robust, with epicortical runners bearing secondary haustoria. Young internodes slightly angular with two ridges of orange-brown scales. Mature internodes terete or slightly angular, glabrous.

Older nodes not or only slightly thickened. Leaves decussate, bifacial; petiole 1.5–3 cm long, adaxially channeled and clasping the terminal bud when young, abaxial surface of midvein and margins with orange-brown scales when young; lamina ovate-elliptic, ca. 5–10 × 2.5–6.5 cm, coriaceous, entirely glabrous when mature, adaxially green and dull, abaxially light green and slightly shiny, base rounded, obtuse or slightly cordate, margin entire, with orange-brown scales when young, apex obtuse to rounded, midvein slightly depressed adaxially, abaxially prominently raised and with orange-brown scales when young, secondary venation inconspicuous adaxially, faint abaxially. Inflorescences in the axils of the lowermost leaves or ramiflorous, a sessile involucre head of ca. 25–32 flowers in indistinct sessile triads. Involucre ca. 2.5–4 × 2–2.2 cm, widening towards the apex; involucre bracts 12, decussate, enlarged, chartaceous, not keeled or basal ones slightly keeled when young, imbricate, tightly enclosing the developing flowers, green; upper involucre bracts ovate, ca. 2.5 × 1.5 cm, apex rounded, saccate, glabrous. Bracteoles absent. Pedicel ca. 0.7–0.9 mm long at anthesis, elongating to ca. 2 mm long in fruit. Ovary quadrangular or pentagonal in cross section, ca. 3 × 3 mm, pink, slightly yellow at apex. Calyculus (calyx tube) indistinct, ca. 0.2 mm long, yellowish orange. Corolla in mature bud ca. 4.5–5.2 cm long, 6-merous, regularly gamopetalous, not inflated at base. Corolla in mature, open flower splitting into lobes about half its length with the tube; free petal segments of tube each ca. 1.8 mm long, pale green; terminal corolla lobes strongly reflexed, ca. 10–12 mm long, red. Stamens with free portion of filaments ca. 2 mm long, pinkish red; anthers basifixed, immobile, not spurred at the base, ca. 7 mm long, apex narrowly tapering, purple when mature. Style simple, very slightly swollen at base, non-articulate above the base, ca. 40–50 mm long, projecting slightly beyond the stamens, ca. 1.0 cm beyond the corolla, pale green, becoming red apically; stigma knob-like, red, darker than apex of style. Fruit depressed orbicular, ca. 5 × 6 mm when immature, slightly angular at base, no stylar base (nipple) present on fruit, calyx limb very short, slightly thickened, scarious, fruit purple when mature; pedicels cup-shaped, irregularly pentagonal (from compression), pale green. Seeds not observed.

Distribution, habitat and ecology:—*Lepeostegeres cebuensis* is presently only known from Nug-as forest in Alcoy Municipality in southern Cebu. Nug-as forest is a ca. 1000 ha area of fragmented secondary forest over limestone at ca. 300–900 m.a.s.l. (Paguntalan & Jakosalem 2007, 2008). It includes regenerating areas of former plantations of exotic trees such as mahogany (*Swietenia macrophylla* King in Hooker 1886: pl. 1550; Paguntalan & Jakosalem 2007). This new species grows on various host trees, including *Myrsine* Linnaeus (1753: 196) sp., *Melicope* cf. *latifolia* (Candolle 1824: 724) Hartley (1994: 72), and *Rhus taitensis* Guillemain (1837: 361). Handsome sunbird (*Aethopyga bella* Tweeddale 1877: 537), magnificent sunbird (*Aethopyga magnifica* Sharpe 1876: 297), red-keeled flowerpecker (*Dicaeum australe* Hermann 1783: 223), and pygmy flowerpecker (*Dicaeum pygmaeum* Kittlitz 1833: 2) were observed to feed on floral nectar by one of the authors during previous visits to the area.

Conservation:—*Lepeostegeres cebuensis* has thus far only been reported from Nug-as forest, which occupies a total area of less than 12 km² (Paguntalan & Jakosalem 2008). This forest does not have protected status, although it is managed by people's organizations under the Community-based Forest Management Agreement (CBFMA) with the Department of Environment and Natural Resources (DENR; Paguntalan & Jakosalem 2008). Although locally common in the parts of Nug-as forest that were visited by the authors, it is presently unclear if it is present throughout the area and, if so, equally abundant there. It is therefore currently not possible to reliably estimate the number of sites where *L. cebuensis* occurs or to estimate the total number of individuals in the area. We therefore consider this species to be Data Deficient (DD; IUCN 2014).

Notes:—*Lepeostegeres cebuensis* most closely resembles *L. congestiflorus*, but has longer petioles (1.5–3 cm vs. 0.5–1.5 cm long; Merrill 1909, Danser 1935, Barlow 1997). In addition, the corolla of *L. congestiflorus* is 2.3–3.2 cm long and greenish-white, greenish yellow, or yellow, and is sometimes red at the base (Merrill 1909, Danser 1935, Barlow 1997). In contrast, the corolla of *L. cebuensis* is distinctly larger (4.5–5.2 cm long) and has a pale green tube with red lobes. The involucre bracts of *L. congestiflorus* were described to be already partially deciduous at anthesis (Danser 1935), whereas those of *L. cebuensis* are persistent in early senescent inflorescences. More significantly, however, all currently known *Lepeostegeres* species are described as entirely glabrous (Merrill 1909, Danser 1935, Barlow 1997), except for the involucre of the young inflorescences of *L. acutiflorus* (Barlow 1997). In contrast, *L. cebuensis* has conspicuous orange-brown scales on the leaf and petiole margins and abaxial side of the midvein of the young leaves. Those on the midvein are decurrent on the young internodes, forming two ridges of scales.

Furfuraceous indumentum is seen in a number of species of small-flowered neotropical Loranthaceae (Kuijt 2011). The arrangement of this indumentum into stripes on young stems, petioles, midribs, and leaf margins is especially well developed in various species of *Oryctanthus* Eichler in Martius (1868: 87), a genus of mistletoe found in central and South America: *O. asplundii* Kuijt (1976: 511), *O. florulentus* Urban (1897: 31), *O. guianensis* Kuijt (2011: 465), *O. grammatus* Kuijt (2011: 463) and *O. spicatus* Eichler in Martius (1868: 87). At least in *Oryctanthus*, SEM reveals that the indumentum is composed of corky outgrowths (Kuijt 2011). Whether the feature in *Lepeostegeres cebuensis* is developmentally similar remains to be determined. *Lepeostegeres* (Tribe Elytrantheae, X = 12) and *Oryctanthus* (Tribe Psittacanthaeae, X = 8) are phylogenetically distant (Vidal-Russell & Nickrent 2008), hence the furfuraceous lines have likely evolved convergently.

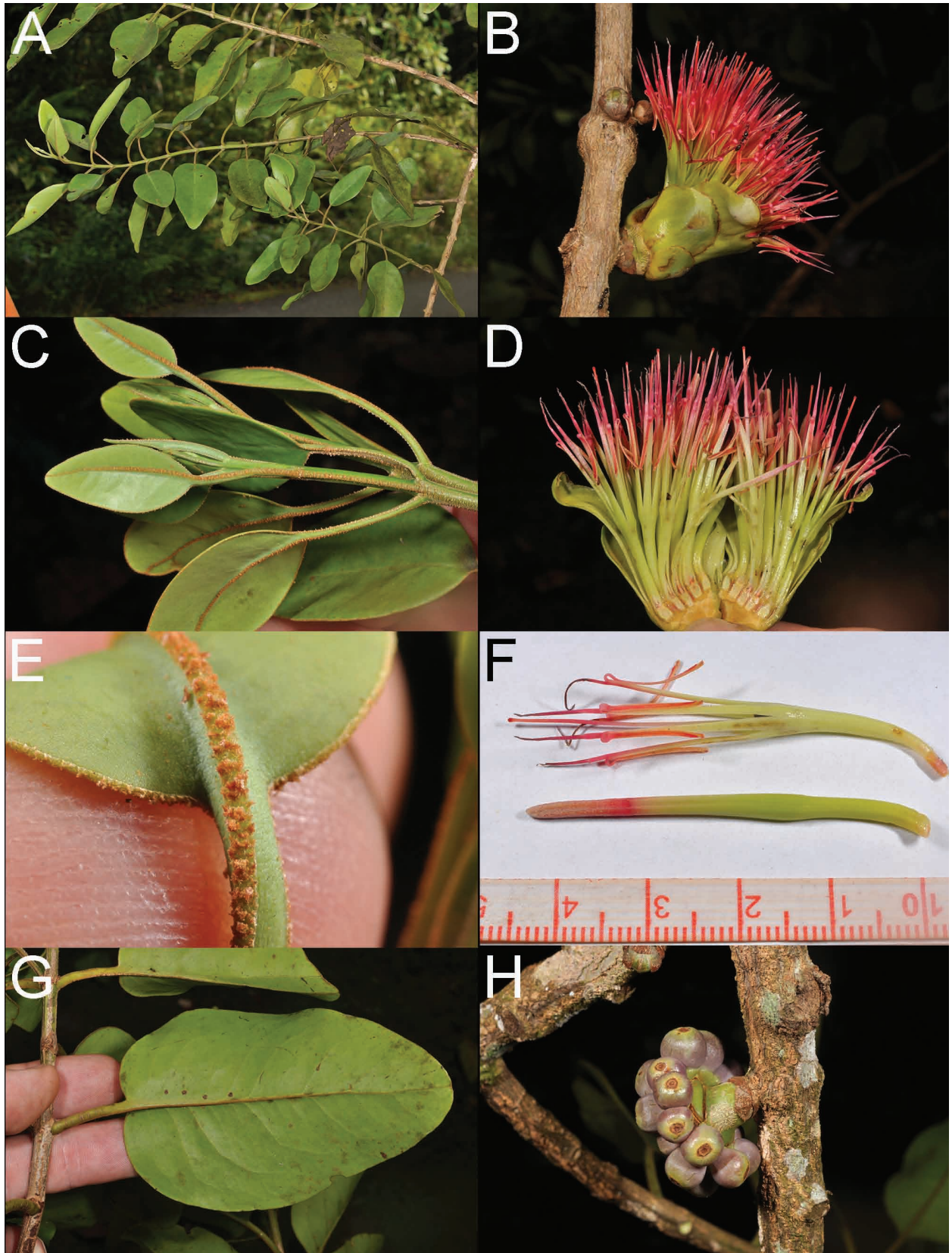


FIGURE 1. A–H. *Lepeostegeres cebuensis* **A.** Twigs with leaves. **B.** Inflorescence. **C.** Young leaves and internodes showing ridges of brown scales. **D.** Longitudinal section of an inflorescence. **E.** Ridge of brown scales on abaxial surface of midvein of young leaf. **F.** Flower and flower bud. **G.** Abaxial view of adult leaf. Note the absence of brown scales. **H.** Infructescence. Additional photos are available from the PhytoImages website (Nickrent *et al.* 2006 onwards).

A mistletoe with immature inflorescences was photographed (but not collected) on Mt. Apo in 2012 (PhytoImages DOL74401, DOL74403, DOL7440, DOL74413, DOL74531, DOL108596; Nickrent *et al.* 2006 onwards). Although this plant keyed to *L. congestiflorus*, it was not entirely glabrous. Its young stems, petioles, and leaf midveins and margins contained sparsely distributed scales, although not nearly to the extent seen in *L. cebuensis*. Furthermore, this plant had much shorter petioles and young internodes that were terete instead of slightly angular and ridged. Herbarium specimens of *L. congestiflorus* examined (Gaerlan, Sagcal, Romero 10919; Gaerlan, Romero, Conran 26525; Reynoso, Garcia, Sagcal 14575; Barbon, *et al.* 8825, all at BRIT and Jacobs 7004 at MO) did not have these scales, thus it is presently not clear whether this species is polymorphic, if the Mt. Apo mistletoe represents an unknown species, or if it is a hybrid between *L. congestiflorus* and *L. cebuensis*. Hybridization and introgression, although generally rare in Loranthaceae, has been proposed for several genera (Barlow 1997).

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