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Opuntia leoglossa sp. nov. (Cactaceae): a new identity for the aloctone “Lion’s Tongue” cactus

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Abstract

Recent studies have shown that a worldwide cultivated plant known as “Lion’s Tongue” has been historically and wrongly assigned to another taxon name (*Opuntia schickendantzii*). After a literature study and the examination of herbarium specimens, we propose to describe the “Lion’s Tongue” as *Opuntia leoglossa* sp. nov. Although a hybrid origin or artificial selection is speculated, further studies must be carried out to better understand this taxon which has a hitherto unknown origin.

Keywords: exotic flora, new species, *Opuntia schickendantzii*, Opuntieae, prickly pear

Introduction

Opuntia (L.) Miller (1754: without pagination) is one of the most iconic group of the cactus family (Cactaceae Juss.) and it is recognized as the second most speciose genus within the family after *Mammillaria* Haworth (1812: 177) (see Hernández-Ledesma *et al.* 2015). The prickly pear cacti (*Opuntia* s.l.) are characterized by a high morphological diversity which derives from hybridization, reticulate evolution, and polyploidy (Rebman & Pinkava 2001, Pinkava 2002, Majure *et al.* 2012a, Majure & Puente 2014). Despite their origin and natural occurrence in the Americas (Majure *et al.* 2012a), several species have been worldwide introduced for an array of purposes such as food, ornamental plant, fodder, biofencing as well as for producing natural dye from cochineal insects (Anderson 2001, Nobel 2002, Ranjan *et al.* 2016). This has led to several uncontrolled spreading of some taxa, favored by the easy vegetative reproduction (flattened stems, cladodes, and pericarpels producing adventitious roots) and generally high-stress tolerance, yielding serious ecological invasions in different parts of the world, especially South Africa, Australia, and Europe (Freeman 1992, Vilá *et al.* 2003, Novoa *et al.* 2015, Schackleton *et al.* 2017).

Opuntia schickendantzii F.A.C.Weber (in Bois 1898: 898) is a wild prickly pear cactus that naturally occurs in southwestern South America (Argentina and Bolivia) throughout the median elevation of the Andes cordillera (1000–2000 m a.s.l.). Recent studies have reassessed the identity of this taxon by the use of morphological and molecular phylogenetic methods (Köhler *et al.* 2021), revealing that it as a distinct lineage within the *Salmonopuntia* clade, recognized by the primary terete stem with mostly monopodial growth, epidermis ashen green, glaucous, and the prolific production of immature, unripe and/or sterile globose fruits that generate vegetative propagules. During that work, several records of a disparate prickly pear cactus in Australia and southern Europe, popularly known as “Lion’s Tongue”, were found referring to *O. schickendantzii*. However, our analyses revealed those identifications as problematic. Here, we present an updated research to address the taxonomic identity of the “Lion’s Tongue” prickly pear cactus.

Material and methods

A literature review was carried out comprising the main classical treatments that include *Opuntia* species (Schumann 1899, Britton & Rose 1919, Bravo-Hollis 1937, Backeberg 1958, 1966, Ritter 1979, 1980, Anderson 2001, Hunt *et al.* 2006) to assess morphological affinities between the “Lion’s tongue” plant and the hitherto known species described. Based on that literature, a second revision was taken accessing the magna opera that contains further original descriptions through the use of electronic libraries and virtual databases (i.e., Tropicos 2021, Botanicus 2021, IPNI 2021, JSTOR 2021, BHL 2021), and other specific journals. By checking that no previously known *Opuntia* species match the “Lion’s Tongue” morphotype, we focused to glean additional morphological and ecological data consulting herbaria specimens as well as human observations through GBIF (2021), iDigBio (2021), the Australasian Virtual Herbarium (AVH 2021), and the Atlas of Living Australia (ALA 2021). We then delimited species using the morphological species concept (Stace 1989), and prepared morphological descriptions following the methodology and nomenclature from Radford *et al.* (1976).

Results and discussion

Our survey revealed that the taxon “Lion’s Tongue” has been constantly and incorrectly cited as *Opuntia schickendantzii*. Most of these references came from cultivated or naturalized plants in Australia (since 1993 to present) and southwestern Europe, in Spain (2014–present). While some of the formers compilers of the cacti diversity (Schumann 1899, Britton & Rose 1919) treated *O. schickendantzii* conforming with the wild prickly pear we currently know in the type locality (Catamarca and Tucumán, Argentina, see Köhler *et al.* 2021), Backeberg (1958) seems to be the first to introduce the “Lion’s Tongue” plant as being related with *O. schickendantzii*. Although merely reproducing the original description and the inputs from Schumann (1899) and Britton & Rose (1919), Backeberg (1958: 408) clearly illustrates *O. schickendantzii* with a “Lion’s Tongue” plant (Backeberg 1958: 409, Abb. 416). Later, in his innovated *Das Kakteenlexikon*, Backeberg (1966: 330) recognized that the “Lion’s Tongue” plant may not be related to the wild *O. schickendantzii* (referring it as “*O. schickendantzii similis*”), but as a designation not validly published without any taxonomic proposal, prevailing to this day the name *O. schickendantzii* to the “Lion’s Tongue” cactus.

The origin of the “Lion’s Tongue” taxon is currently unknown. There are no records of the “Lion’s Tongue” plant growing in natural habitats occurring in the American continent, neither records of its naturalization, nor as an invasive plant in the Americas. However, the “Lion’s Tongue” cactus was cultivated among cacti aficionados in Argentina since the middle of the 20th century (F. Font, pers. obs.). Considering that it has only been found as a naturalized plant or escaped from cultivation, an artificial or hybrid origin is possible. Similar cases are known in *Opuntia*, such as the *O. linguiformis* Griffiths (1908: 270), popularly known as “Cow’s Tongue” [\equiv *O. lindheimeri* Engelm (in Gray & Cambridge 1850: 207) var. *linguiformis* (Griffiths) L.D.Benson (1969: 125) \equiv *O. engelmannii* Salm-Dyck (1849: 235) var. *linguiformis* (Griffiths) B.D.Parfitt & Pinkava (1988: 347), or just a garden form of *O. lindheimeri* (Powell & Weedein 2004, Shaw *et al.* 2018)]. *Opuntia linguiformis* is widely cultivated in North American gardens and it is supposed to be a selected clone originated from wild plants whose cladodes features (elongated with the “tongue” form) were attractive to be grown as an ornamental cactus among collectors. However, regarding the “Lion’s Tongue” cactus, a hybrid origin hypothesis is also suggested based on previous studies. Some molecular chloroplast markers revealed the “Lion’s Tongue” plant embedded within the *Brasilopuntia* clade (see Majure *et al.* 2012a, Majure & Puente 2014, Köhler *et al.* 2021), but without sharing obvious morphological characters with that lineage. So, further analyses including nuclear markers, as well as molecular cytogenetics, must be carried out to better address the origin and systematics of the “Lion’s Tongue” plant.

Once the identity of *Opuntia schickendantzii* is showed to be unrelated to the plant called “Lion’s Tongue” (Köhler *et al.* 2021), and our studies do not find any published name which can be applied to “Lion’s Tongue”, it is unnamed. As a consequence, we here provide a formal description of a new species, considering the importance that an applicable name has for the taxon in floristic and ecological studies.

Opuntia leoglossa Font & M.Köhler, *sp. nov.* (Figs. 1–2)

Type:—AUSTRALIA. Victoria, Riverina, Greta West, McLeans Road, 21 January 1994, *Stajsic 1006* (holotype mounted in two separate labeled sheets—MEL2023597! and MEL2089030!—and one spirit collection—MEL2089026!; Isotypes at NSW395077!, and CANB481700!).

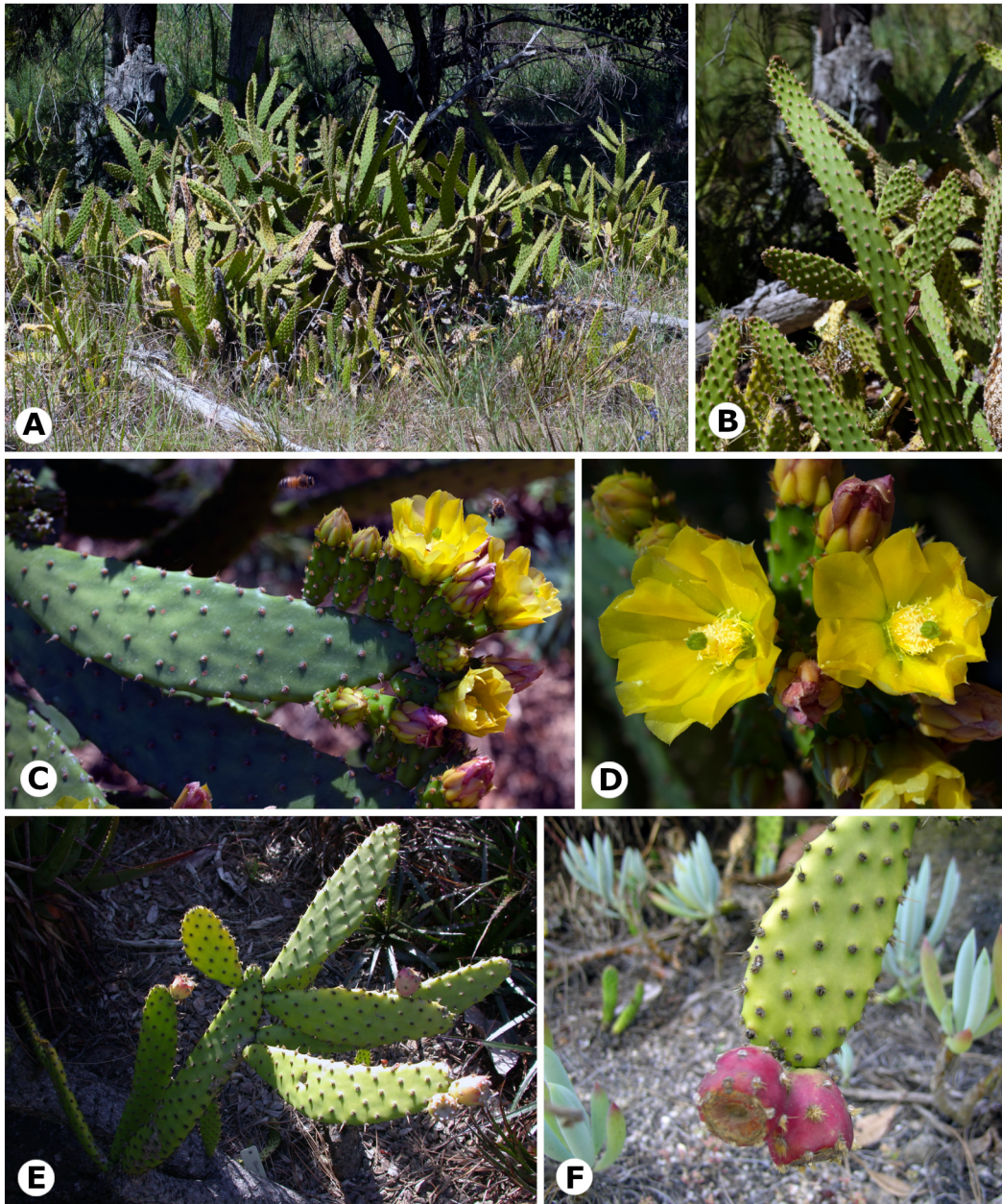


FIGURE 1. Morphological features of *Opuntia leoglossa*. **A.** Plant in habitat **B.** Detailed aspects of the cladodes **C.** Cladodes with flower buds and flowers in anthesis **D.** Detailed aspects of the flowers **E.** Cladodes with unripe fruits **F.** Ripe fruits. (Photo acknowledgments: A,B,C,D—© M. Fagg, 2008–2009; E—© R.G. & F.J. Richardson, 2005; F—© R.C.H. Shepherd, 2005).

Diagnosis:—*Opuntia leoglossa* morphologically resembles *O. puberula* Pfeiffer (1837: 156) from which differs by the elongated cladodes (vs. elliptic to short ovoid in *O. puberula*). *O. leoglossa* is also similar to *O. linguiformis*, but can be distinguished by the light dull green epidermis (vs. blue-glaucous green in *O. linguiformis*).

Description:—*Shrub*, decumbent to erect, 1–2 m tall; trunk frequently present, 15–18 cm in diam. *Stem segments flattened (cladodes)* 25–35 cm long × 3.5–6.0 cm wide × 5–10 mm thick, narrowly elongated, linear-elliptic to long-oblong, not tuberculated; epidermis light to pale green, dull, not glaucous. *Areoles* 40–70 per cladode face, circular to subcircular, 0.3–4.5 cm in diam., sometimes protuberant in young cladodes, 1–2 cm distance between each other in diagonal; with whitish wool turning greyish at aging. *Leaves* conic, green to chartreuse yellow, rarely with vinaceous pigments, succulent, 2–4 mm, caducous, ascending. *Glochids* present, in a dense tuft brushlike, beige to dirty-yellow, 1–2 mm long, in cladodes, pericarpel, and fruit areoles. *Spines* 0–1(–3) per areole, acicular, 0.5–1.0 cm long, usually antrorse, rarely retrorse, whitish to pale yellow turning greyish at aging; only on occasional areoles. *Pericarpel* 1.5–3.0 cm long × 1.0–1.2 cm wide, slightly elongated to short obconic, not tuberculated. *Flower bud apex* acute, chartreuse green to pale pink. *Flowers* numerous, 4–5 cm in diameter at anthesis; external tepals chartreuse green, sometimes

pale pink-tinged, succulent, triangular to lanceolate; inner tepals bright yellow sometimes turning light orange after anthesis, largely obovate with obtuse and mucronate apex. *Stamens* numerous, cream to pale yellow filaments and anthers. *Style* white, 1.6–1.8 cm long, obconic with a narrowed base. *Stigma* 5–7 lobed, green. *Fruit* obovoid to obconic, chartreuse green when immature to purple-red when ripe, 2.5–3.5 cm long × 1.5–2.0 cm in diameter; shallow but wide umbilicate apex. *Seeds* not seen.



FIGURE 2. Holotype (Sheet 1 of 3) of *Opuntia leoglossa* (MEL2023597!), housed at MEL. Reproduced with permission from the Royal Botanic Gardens Victoria (National Herbarium of Victoria, MEL).

Etymology:—The epithet refers to the Latinization of the vernacular name “Lion’s Tongue”: *leo*, apocope of the word *leonem* (meaning lion, from Latin), and *glossa* (meaning tongue, from Greek).

Vernacular name:—“Lion’s Tongue”, “Chicken Dance Cactus”, “lengua de leon”, “língua de leão”.

Chromosome number:— $2n = 22$ (diploid) (L.C.Majure 7086, FLAS, Majure *et al.* 2012b, sub *O. schickendantzii*).

Distribution, habitat, and ecology:—*Opuntia leoglossa* has an unknown origin, but is recorded in Australia (Western Australia, South Australia, New South Wales, Australian Capital Territory, and Victoria-Stajsic & Carr 1996, sub *O. schickendantzii*) and Spain (Valencia and Huelva-Gullón *et al.* 2014, Guillot-Ortíz & Sáez 2014, sub *O. schickendantzii*). It usually grows along roadsides, degraded areas, railway embankments, and open disturbed woodlands. It is an exclusively ornamental plant, with no other economic uses reported. It has important limitations to be considered an invasive weed because the only means of dispersal seems to be through human action. The cladodes are not easily detachable, and the spines do not have the strength or the size to be attached to the fur of animals together with parts of the stem.

Specimen examined:—**AUSTRALIA. WESTERN AUSTRALIA.** 0.5 km N of Yellowdine, 31° 17' 33.5" S, 164° 45' 15" E, 03 October 2014, *Chinnock 10452* (photo AD!, PERTH [n.v.]); **SOUTH AUSTRALIA.** Yaninee, 32° 56' 48" S, 135° 16' 23" E, 07 August 2010, *Chinnock 10264* (photo AD!); Adelaide Hills, near Woodside, 34° 55' 58" S, 138° 54' 10" E, 16 December 2013, *Brodie 5307* (photo AD!); Campbelltown, 34° 52' 23" S, 138° 39' 13" E, 10 December 2013, *Brodie 5262* (photo MEL!) **VICTORIA.** Opposite 59 Porter Street, 37° 51' 3" S, 144° 59' 17" E, 11 February 2008, *Chinnock 10128* (photo AD!); Greta West, opposite the Greta West Post Office, 36° 31' 59.2" S, 146° 13' 36.1" E, 21 January 1994, *Stajsic 1006* (photo CANB!, photo MEL!, photo NSW!); South Morang, George Road, road cutting between Yan Yean Rd and Plenty Rd., 37° 39' 00" S, 145° 07' 00" E, 30 December 1993, *Stajsic 1220* (photo MEL!, spirit [n.v.]). **NEW SOUTH WALES.** 0.4 km E of High Street, E edge of Ganmain, on the Junee Rd., 34° 47' 41.2" S, 147° 03' 17.6" E, 3 December 2009, *Chinnock 10242* (photo AD!); N outskirts of Griffith, N side of Combe Rd opposite intersection with Duchatel Rd, 34° 16' 26" S, 146° 00' 47.9" E, 1 October 2004, *Mallinson 723* (B [n.v], photo MEL!, photo CANB!, NSW [n.v], photo SI!, TARCH [n.v.]); Ca. 3 km E of Yenda, N edge of Cemetery Rd., 34° 28' 09.1" S, 146° 13' 54" E, 27 November 2005, *Mallinson 813* (photo CANB!, photo MEL!, NSW [n.v.]); Yass district, 34° 49' 48" S, 148° 55' 12" E, July 2009, *Minehan s.n.* (NSW 869496). **AUSTRALIAN CAPITAL TERRITORY.** Canberra, Suburb of Bruce; c. 20 m W from first bus stop on W side of Haydon Drive, from junction with Barry Drive, 35° 15' 15" S, 149° 05' 13" E, 622 m, 1 November 2008, *Purdie 6916A* (photo CANB!); *ibid.* 25 December 2008, *Purdie 6916B* (photo CANB!).

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