



ARTICLE

Two new records of *Lactuca* L. (Cichorieae, Asteraceae) in South America

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ABSTRACT: (Two new records of *Lactuca* L. (Cichorieae, Asteraceae) in South America). *Lactuca indica* and *Lactuca canadensis* have been recorded for the first time in the Americas and in South America, respectively. *Lactuca indica* is native to Eastern Asia, and *L. canadensis* to North America. In Brazil, *L. indica* is used as a substitute for lettuce in some communities. The leaf shape in the Brazilian plants of the two species is less variable than in Asiatic or North American populations. This could possibly be a result of a single introduction to Brazil of each species. Both species are weeds, occurring in disturbed habitats in south and south-eastern Brazil. The two species are described, illustrated and their affinities are discussed. An identification key is provided to the six species of *Lactuca* (all introduced) in South America.

Keywords: Compositae, edible plant, lettuce, neotropics, Brazil.

RESUMO: (Dois novos registros de *Lactuca* L. (Cichorieae, Asteraceae) para a América do Sul). *Lactuca indica* e *Lactuca canadensis* foram registradas pela primeira vez nas Américas e na América do Sul, respectivamente. *Lactuca indica* é nativa da Ásia Oriental e *L. canadensis*, da América do Norte. No Brasil, *L. indica* é usada como substituta à alface em algumas comunidades. A forma da folha nas plantas brasileiras das duas espécies é menos variável do que nas populações asiáticas ou norte-americanas. Isso possivelmente pode ser resultado de uma única introdução de cada espécie no Brasil. Ambas espécies são ruderais, ocorrendo em ambientes alterados nas regiões Sul e Sudeste do Brasil. As duas espécies são descritas, ilustradas e suas afinidades são discutidas. Uma chave de identificação é fornecida para as seis espécies de *Lactuca* (todas introduzidas) da América do Sul.

Palavras-chave: Compositae, plantas comestíveis, alface, neotrópico, Brasil.

INTRODUCTION

Lactuca sativa L. is one of the most important edible plants and a major vegetative food commodity in the sunflower family (Simpson 2009). In 2012 it had a worldwide production of approximately 24,000,000 tons (FAO 2015). Members of *Lactuca* L. are also medicinally important, with some species used in the treatment of asthma, bronchitis, insomnia and cough (Bano & Qaiser 2011).

Lactuca is the most widely distributed genus in the tribe Cichorieae, natively occurring in Africa, Asia, Europe and North America (Kilian *et al.* 2009). However, in other countries it occurs as introduced, it has been introduced due to its economic importance, or naturally as a weed (Hurrel & Deluchi 2013). In North America almost one-third to a half of *Lactuca* diversity is represented by introduced species (Dille 1974, Strother 2006). So far, only four introduced species of *Lactuca* have been recorded in South America: *Lactuca sativa*, *L. saligna* L., *L. serriola* L. and *L. virosa* L. (Cabrera 1971, 1974, Ariza-Espinar & Urtubey 1998, Robinson *et al.* 1999, Hurrel & Deluchi 2013, Kilian *et al.* 2015).

Lactuca comprises 50–70 species (Lack 2007), depending on the adopted circumscription (Kilian *et al.* 2009).

Numerous contradictory classifications of the genus have been proposed, but none of them have been based on a worldwide treatment. The first phylogenetic analysis of *Lactuca* and related genera was conducted by Koopman *et al.* (1998) using one nuclear marker (ITS-1). The genus was shown to be monophyletic and the authors identified three gene pools in *Lactuca*, named *L. sativa* primary gene pool, *L. saligna*-*L. serriola* secondary gene pool, and *L. tatarica*-*L. viminea* tertiary gene pool. More recently, a densely sampled molecular phylogenetic analysis helped to clarify relationships among Asian species of *Lactuca* (Wang *et al.* 2013).

During fieldwork, two species of lettuce recognized as different entities were found that did not match any previously known species of *Lactuca* from Brazil or other countries in South America. They were later identified as *L. canadensis* and *L. indica*, respectively.

MATERIAL & METHODS

This study was based on material studied in the field and subsequently deposited in the following herbaria: B, PMSP, S, SPSF, and UEC (Thiers 2015). Morphological characters were studied with an Olympus SZX16 stereo microscope.

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RESULTS AND DISCUSSION

1. *Lactuca canadensis* L., *Sp. Pl.* 2: 796. 1753. (Figs. 1, 2 A-C, 3).

Synonymy: Strother (2006)

Herb, annual, 1–1.8 m high, with taproot. Stem unbranched, glabrous, striate, greenish with purplish spots. Latex pale yellow or pale orange. Leaves spirally alter-

nate, sessile, not clasping; basal leaves, blade 8–18(20) × 2–8 cm, pinnately lobed, pinnatifid, 2–4 pairs of lateral lobes, all lobes acute, thin, margin entire, apex acute, cladodromous, venation prominent abaxially, impressed adaxially, both surfaces glabrous; apical leaves, blade 5–8 × 1–3 cm, entire, lanceolate to narrowly lanceolate, thin, apex acuminate, margin smooth, eucamptodromous, venation prominent abaxially, impressed adaxially, both

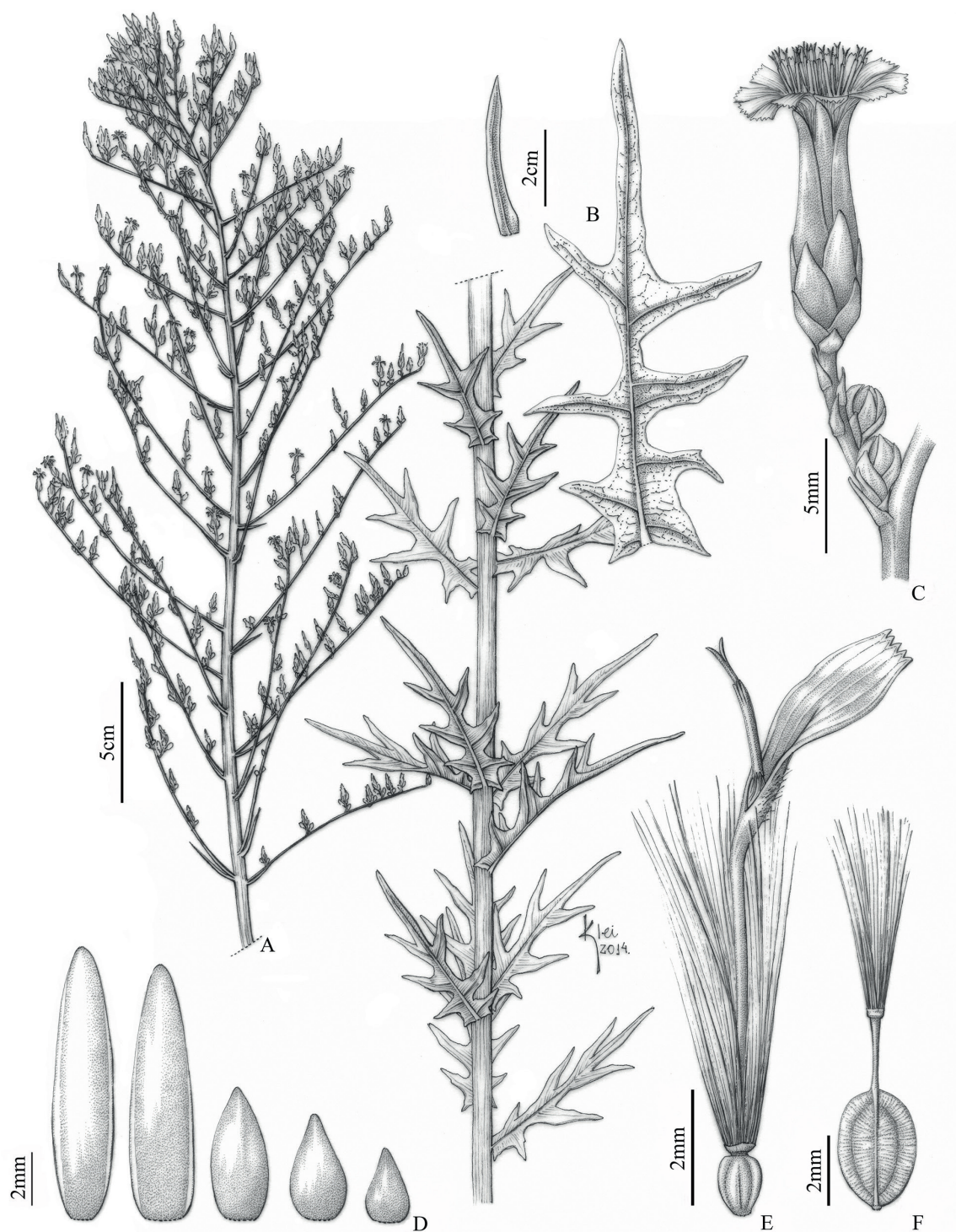


Figure 1. *Lactuca canadensis*. A. Fertile branch. B. Leaves. C. Lateral secondary inflorescence with a capitulum. D. Involucral bracts. E. Flower. F. Cypsela and pappus. (Peña 76, PMSP). Drawn by Klei Sousa.

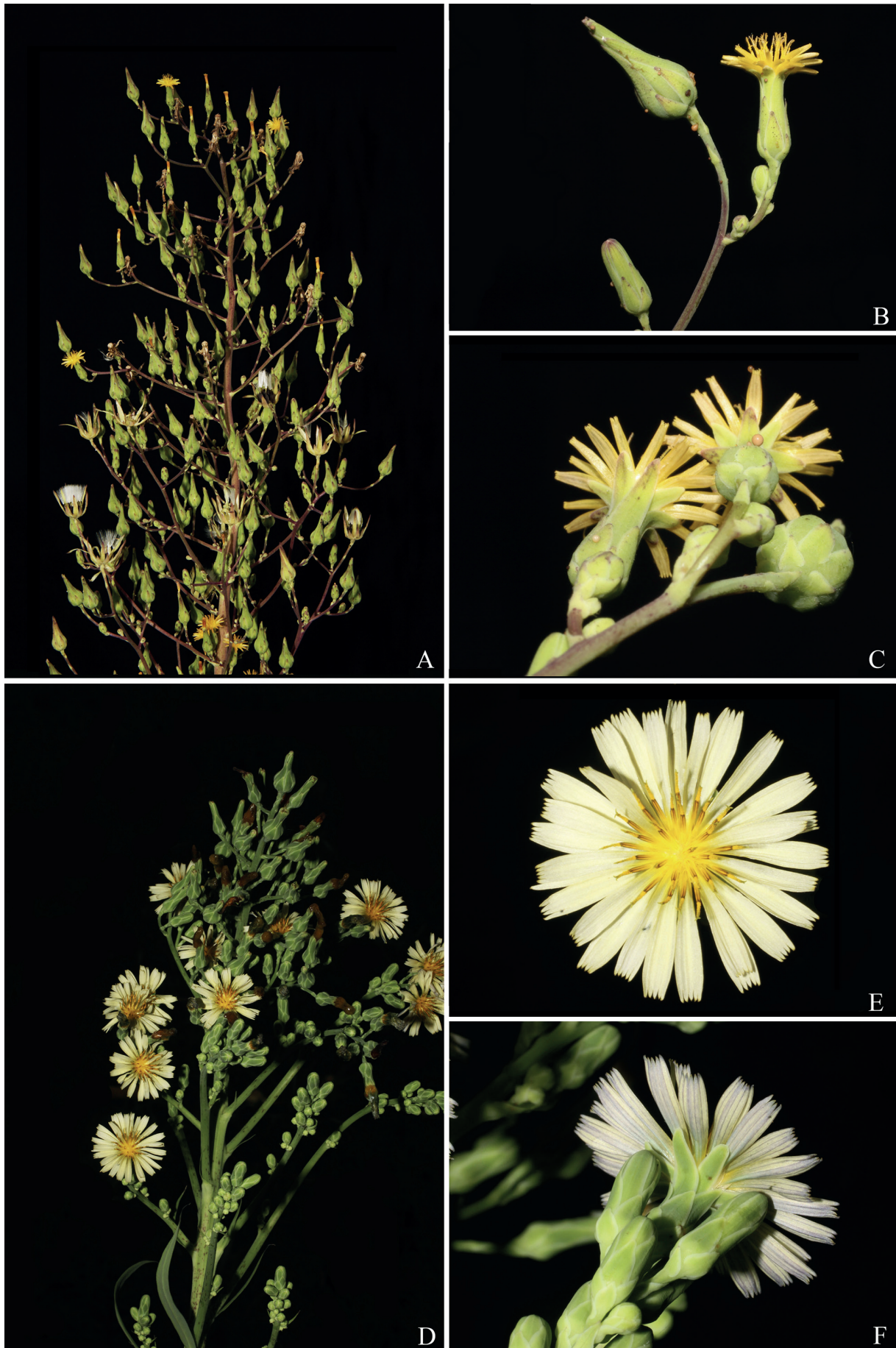


Figure 2. *Lactuca canadensis* and *L. indica*. A–C. *L. canadensis*. A. Fertile branch. B. Lateral view of capitulum. C. Abaxial view of capitulum. D–F. *L. indica*. D. Fertile branch. E. Frontal view of the capitulum. F. Lateral view of the capitulum. (Photos by M. Monge).

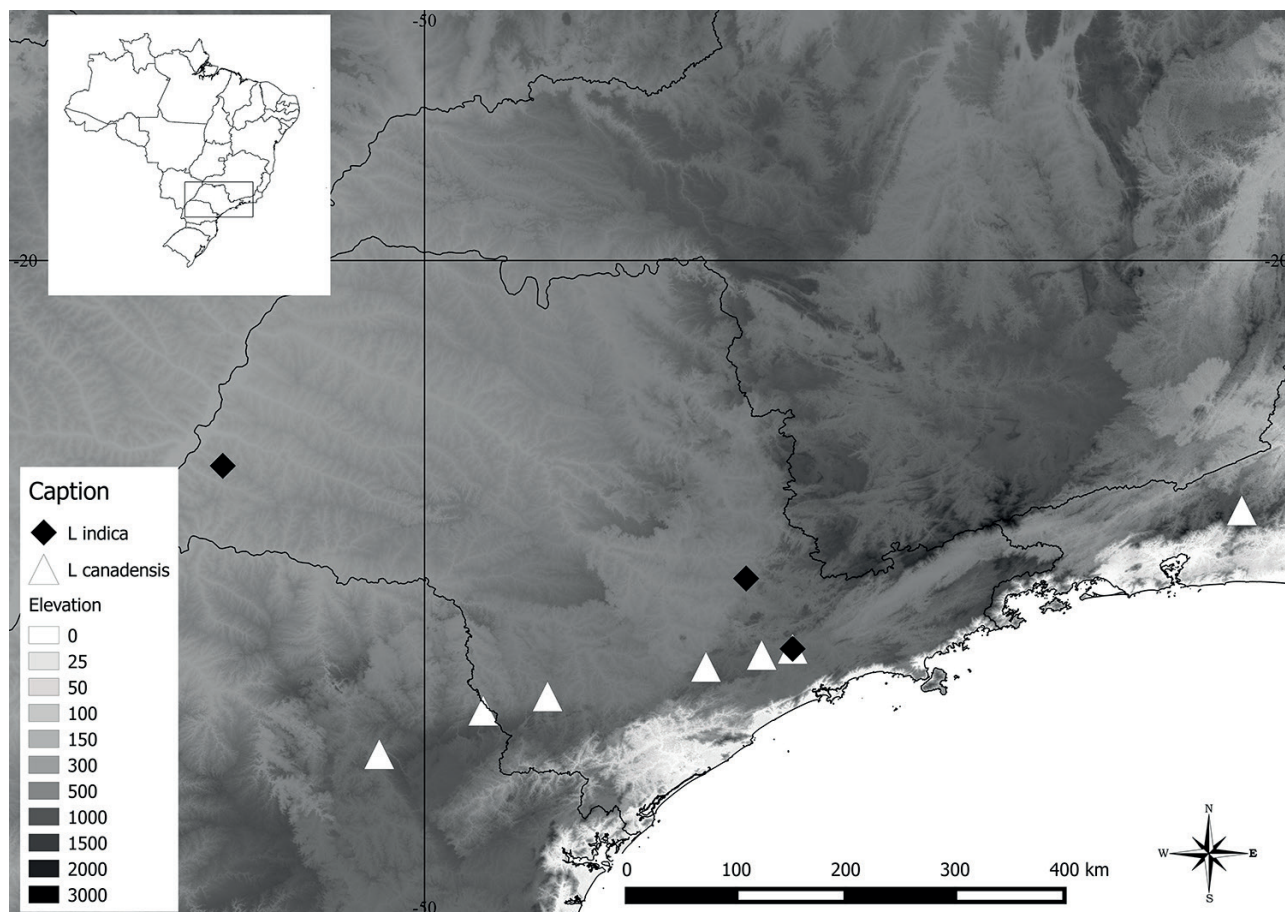


Figure 3. Distribution map of *Lactuca canadensis* and *L. indica* in south and south-east Brazil.

surfaces glabrous. Secondary inflorescences cylindrically to rarely conical paniculiform with numerous capitula, branches with bracts linear-lanceolate; peduncle 2–8(18) mm long; involucre narrowly cylindrical, 9–12 mm long; involucre bracts 5–6 series, ovate, lanceolate, narrowly lanceolate, 3–6 × 1.4–1.6 mm, green, acuminate apex, purplish, margin very narrow whitish hyaline, glabrous. Flowers 18–21, bisexual, corolla ligulate, 8–10 mm long, 5-toothed, yellow in both surfaces, tube distally sparsely pubescent externally; yellow anthers, basally caudate; style branches barbellate on shaft and branches, apex glabrous, yellow. Cypselae rostrate, 6–7 mm, dark brown, beak ca. 2 mm long, body dorsiventrally compressed, lateral ribs winged, wings scabrous, with one facial rib on either side. Pappus simple, white, 5–6 mm long, persistent, bristles smooth.

Distribution: *Lactuca canadensis* is found in the Brazilian states of Rio de Janeiro, São Paulo, and Paraná (Fig. 3). The oldest collection from Brazil known to us dates back from 1999. This is the first report of the species in South America. This species occurs as native in Canada, the United States, Mexico (Strother 2006), Haiti and Dominican Republic (Liogier 1996, Acevedo-Rodríguez & Strong 2012).

Ecology and Phenology: In Brazil, *Lactuca canadensis* is a common weed that grows in disturbed, humid environments, forest edges (border), the understorey

of *Eucalyptus* L'Hér. and *Pinus* L. plantations and near roads. Flowering and fruiting in November and February.

Vernacular in Brazil: Almeirão-serralha.

Uses in Brazil: unknown.

Material examined: BRAZIL. PARANÁ: **Sengés**, Road to Sengés-Ponta Grossa PR-239, 11 Jan. 2014, *M. Monge* 2326 (UEC); **Tibagi**, Guartelá State Park, 14 Jan. 2014, *M. Monge* 2411 (UEC). RIO DE JANEIRO: **Nova Friburgo**, Pedra do Imperador, 16 Sep. 2012, *M. Monge* & *A.V. Scatigna* 1165 (UEC, S). SÃO PAULO: **Cotia**, 15 Feb. 2014, *M. Monge* & *B.B.Z. Vigna* 2500 (UEC); **Itapeva**, road to Bom Sucesso do Itararé, 8 Jan. 2014, *M. Monge* 2291 (UEC, S); **Piedade**, road to Sorocaba SP-079, 7 Feb. 2014, *M. Monge* & *B.B.Z. Vigna* 2498 (UEC); **São Paulo**, Alberto Loefgren State Park, 6 Dec. 1999, *R. Esteves* 133 (UEC, SPSF); Raposo Tavares Road 16.5 km, 20 Nov. 2015, *M. Monge* 3250 (UEC); Rodoanel 8 Km in between the tunnels, 20 Nov. 2015, *M. Monge* 3252 (UEC).

Morphology and Taxonomy: *Lactuca canadensis* is known to be polymorphic, with multiple leaf shapes in its native distribution areas, and even somehow presenting an unclear distinction from its closest relatives, probably due to introgression (Radloff 1961). However, the Brazilian specimens are remarkably uniform, perhaps indicating a single introduction event. Whereas the Brazilian plants have leaves not clasping the stem (Fig. 1A),

basal leaves with pinnatifid (Fig. 1B) and apical leaves entire, lanceolate and, narrowly lanceolate blade (Fig. 1B), North and Central American plants are more variable, with leaves that clasp or not the stem, basal leaves with pinnatifid, ovate or only toothed blades, and apical leaves with entire, linear, lanceolate, ovate, obovate, or pinnatifid blades.

Lactuca canadensis is superficially similar to *L. serriola*, which also occurs in Brazil (Schneider 2015), because of its habit as an unbranched herb, with basal leaves having sinuate margins, but they differ by not having auriculate leaf base (vs. auriculate), leaves and stems unarmed (Fig. 1A–B) (vs. leaf margins, principal veins, and stems prickly), and compressed cypselas with lateral wings (Fig. 1F) (vs. ellipsoid cypselas without lateral wings). *Lactuca canadensis* resembles *L. saligna* by its basal pinnatifid leaves (Fig. 1B), apical linear-lanceolate leaves (Fig. 1B) and yellow corollas (Fig. 2A–C). However, the former differs from the latter by being taller – 1–1.8 m high (vs. 0.2–0.8 m) – with capitula in large cylindrical paniculiform secondary inflorescences (Fig. 1A, 2A) (vs. spiciform to racemiform), yellow anthers without longitudinal purplish lines (vs. yellow anthers with longitudinal purplish lines), larger leaves 8–18(20) × 2–8 cm (vs. 3–8 × 1–2.5 cm), peduncle 2–8(18) mm (Fig. 1C) (vs. sessile to subsessile capitula) and compressed cypselae with lateral wings (Fig. 1F) (vs. ellipsoid cypselas without lateral wings). Additionally, *L. canadensis* is also morphologically similar to *L. indica* due to the dorsiventrally compressed fruits, with scabrous winged margins (Fig. 1F). It differs by the pinnately lobed to pinnatifid basal leaves (Fig. 1B) (vs. elliptic, narrowly elliptic, to oblong-elliptic (Fig. 4A, 4C)); cladrodromous venation (vs. brochidodromous); pale yellow to pale orange latex (Fig. 2C) (vs. whitish); yellow corolla (Fig. 2B–C) (vs. pale yellow adaxially and purplish abaxially (Fig. 2D–F)), yellow anthers (vs. yellow with longitudinal purplish lines), yellow-style branches (vs. purplish); and cypselas with 0.5–1 mm long beak (Fig. 1F) (vs. 2 mm beak (Fig. 4G)).

2. *Lactuca indica* L., *Mant. Pl.* 2: 278. 1771. (Figs. 2D–F, 3, 4)

Synonymy: Shi & Kilian (2011)

Herb, annual, 1–2 m high, with taproot. Stem unbranched, glabrous, striate (costate), greenish with purplish spots. Latex whitish. Leaves spirally alternate, sessile; blade 9–25(33) × 1.1–4.3(5.2) cm, elliptic, narrowly elliptic, oblong-elliptic, thin, sessile base, not clasping, apex acuminate to attenuate, margin entire or dentate, weak brochidodromous, pale yellow principal vein, venation prominent abaxially, impressed adaxially, both surfaces glabrous. Secondary inflorescences conically to widely cylindrically paniculiform to corymbiform, bracts on branches linear-lanceolate to linear; peduncle of 0.2–1(1.7) cm long; involucre narrowly cylindrical, 7–13(17) mm long; involucral bracts in 4–5 series, widely

ovate, ovate, lanceolate, or narrowly lanceolate, 2–9 × 2–4 mm, green, apex acute, green, margin narrow whitish hyaline, glabrous. Flowers 20–30, bisexual, 9–13 mm long, corolla ligulate, 5-toothed, pale yellow adaxially, purplish abaxially, tube distally sparsely pubescent externally; yellow anthers with longitudinal purplish lines, basally caudate; style branches barbellate on shaft and branches, apex glabrous, purplish. Cypselas shortly rostrate, 4–5 mm long, dark brown-black, beak 0.5–1 mm long, body dorsiventrally compressed, lateral ribs winged, wings scabrous, with one facial rib on either side. Pappus simple, white, 5–6 mm long, persistent, bristles smooth.

Distribution: *Lactuca indica* is known from São Paulo and may occur in Mato Grosso do Sul (M. Egea pers. comm.) (Fig. 3). The oldest collection seen from Brazil dates back from 2003. This is the first report of the species for Brazil, and also seems to be the first for the American continents. The species occurs as native in Bhutan, China, India, Indonesia, Japan, Korea, Philippines, Eastern Russia, Thailand, Vietnam (Shi & Kilian 2011), and has been introduced to South-East Africa (Kilian *et al.* 2015).

Ecology and Phenology: In Brazil, *L. indica* is a rather uncommon weed. It grows in disturbed, humid environments, forest edges, and near farmhouses. In its native distribution area in East Asia, it was probably originally a member of mountainous tall forb communities but spread to a variety of open habitats, and also occurs as a weed. In China, it is one of the most common species of *Lactuca*, occupying a large range of different habitats (Shi & Kilian 2011). Flowering and fruiting in January to February.

Vernacular in Brazil: Almeirão, almeirão-do-mato-grosso, almeirão-do-mato, almeirão-selvagem, and alface-selvagem, radicho-do-mato.

Uses in Brazil: This species is used as a folk substitute for lettuce in salads in south-western São Paulo. It grows naturally without sowing.

Material examined: BRAZIL. SÃO PAULO: **Campinas**, Sítio São Francisco, 7 Jan. 2013, M. Monge *et al.* 999 (UEC); **Presidente Venceslau**, Estância da Matinha, 17 Jul. 2013, M. Monge 2022 (UEC, S); Vila Sumaré, Feb. 2014, A.F.Egea & M. Egea 01 (UEC); 14 Jan. 2015, A.F.Egea, & M. Egea 02 (UEC); **São Paulo**, 20 Feb. 2003, R. Peña 76 (PMSP).

Morphology and Taxonomy: *Lactuca indica* has an extremely variable leaf shape, base, and margins, but the plants collected in Brazil are not as variable as the Asian plants. Brazilian plants always have entire leaves (Fig. 4C), the leaf base is sessile (Fig. 4A), attenuate, and does not clasp the stem. In contrast, Asiatic plants have entire, sinuate, or pinnatisect leaves, leaf base is sessile, cordate, or auriculate-sagittate, scarcely clasps the stem (Kirpicznikov 1964, Shi & Kilian 2011).

Considering the South American species of the genus, *L. indica* is superficially similar to *L. sativa*, which also possesses entire leaves, but the former differs from the

latter by having a non-clasping leaf base (vs. clasping auriculate leaf base), linear bracts in branches of the secondary inflorescence (vs. very widely ovate bracts), pale yellow corollas with purplish tinged abaxial surface (vs. entirely yellow), yellow anthers with longitudinal purplish lines (Fig. 2E–F) (vs. yellow anthers without

longitudinal purplish lines), purplish style branches (vs. yellow) and compressed cypselae with two lateral wings (Fig. 4G) (vs. ellipsoid cypselae without lateral wings). *Lactuca indica* is morphologically similar to *L. canadensis*, their morphological differences are mentioned in the morphology and taxonomy section of the latter species.



Figure 4. *Lactuca indica*. A. Fertile branch. B. Basal branch and root. C. Leaves. D. Capitulum. E. Involucral bracts. F. Flower. G. Cypselae and pappus. H. Cross section of a median region of the cypselae. (Monge 1165, UEC). Drawn by Klei Sousa.

Key to South American *Lactuca* L.

1. Lower portion of stem, leaf mid-vein abaxially and margin prickly.
 2. Stem leaves in sunshine usually held in vertical plane; cypselae greyish brown, body 3–4 mm, beak c. 4 mm long (introduced in Argentina, southern Brazil, Paraguay and Uruguay) *L. serriola*
 - 2'. Stem leaves in sunshine always held horizontally; cypselae dark brown to blackish, body 4–5 mm, beak 3–4 mm long (introduced in Chile) *L. virosa*
- 1'. Stem, leaf mid-vein and margin never prickly.
 3. Leaf base cordately auriculate, clasping stem; upper branches with widely ovate ± cordately clasping bracts (introduced in Argentina, Chile, and Ecuador). *L. sativa*
 - 3'. Leaf base acutely auriculate to sagittate, semi-amplexicaul or, if indistinctly to distinctly clasping stem; upper branches with straight lanceolate, lanceolate, sagittate bracts (introduced in Argentina, Brazil, and Uruguay).
 4. Leaf base sagittate, clasping stem; upper branches with ± sagittately clasping bracts; stem whitish; cypselae body more than twice as long as wide, lateral ribs broadened, not wing-like, and beak distinctly longer than body (introduced in Argentina and Uruguay) *L. saligna*
 - 4'. Leaf base acutely auriculate, semi-amplexicaul or ± clasping base; stem greenish to greenish red; cypselae body at most twice as long as wide, lateral ribs broadly winged, and beak shorter than body.
 5. Leaves usually entire; fresh flowers with pale yellow adaxially and tinged purplish abaxially corollas; anthers yellow with longitudinal purplish lines; cypselae 4–5 mm long, beak 0.5–1 mm long (introduced in Brazil) *L. indica*
 - 5'. Leaves usually pinnately lobed; fresh flowers and anthers bright yellow; cypselae 6–7 mm long, beak c. 2 mm long (introduced in Brazil) *L. canadensis*

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REFERENCES

- ACEVEDO-RODRÍGUEZ, P. & STRONG, M. T. 2012. Catalogue of seed plants of the West Indies. *Smithsonian Contrib. Bot.*, 98: 1-1220.
- ARIZA-ESPINAR, L. & URTUBEY, E. 1998. Tribu XVIII: Lactuceae. In: HUNZIKER, A. T. (Ed.). *Flora Fanerogamica Argentina* 61. Saint Louis: Missouri Botanical Garden Press. p. 1-30.
- BANO, R. & QAISER, M. 2011. Revision of the genus *Lactuca* L. (Cichorioideae - Asteraceae) from Pakistan and Kashmir. *Pakistan J. Bot.*, 43: 2259-2268.
- CABRERA, A. L. 1971. *Lactuca*. In: CORREIA, M. N. (Ed.). *Flora Patagonica*, Part 7, Vol. 8. Buenos Aires: INTA. p. 416-418.
- CABRERA, A. L. 1974. *Lactuca*. In: BURKART, A. (Ed.). *Flora Ilustrada de Entre Rios*, Part 6 Vol. 6. Buenos Aires: INTA. p. 528-531.
- DILLE, D. P. 1974. Revision of the genus *Lactuca* (Compositae: Lactuceae) in the Great Plains. 137p. Master thesis – Division of Biology. Kansas State University, Manhattan, 1974.
- FAO. 2015. Statistics Division of the Food and Agriculture Organization of the United Nations. Available from: <<http://faostat.fao.org/site/291/default.aspx>> Accessed in: 10 may 2015.
- HURREL, J.A. & DELUCHI, G. 2013. *Lactuca*. In: HURREL, J.A. (Ed.). *Flora Rio Platense*, Part 2, Vol 7a. Buenos Aires: Sociedad Argentina de Botánica. p. 106-112.
- KIRPICZNIKOV, M. E. 1964. Cichorioideae. In: BOBROV, E. G. & TZVELEV, N. N. (Eds.). *Flora of the USSR*, Vol. 29. Moscou & Leningrad: Nauka, p. 255-355. (English translation. 2000. Enfield: Science Publishers).
- KILIAN, N., GEMEINHOLZER, B. & LACK, H. W. 2009. Cichorioideae. In: FUNK, V. A., SUSANNA, A., STUESSY, T. F. & BAYER, R. J. (Eds.). *Systematics, Evolution and Biogeography of Compositae*. Vienna: IAPT. p. 343-384.
- KILIAN, N., HAND, R. & RAAB-STRAUBE, E. VON (Eds.); 15: Cichorioideae Systematics Portal. Available from: <<http://cichorioideae-taxonomy.net/portal/>> Accessed in: 5 dec 2015.
- KOOPMAN, W. J. M., GUETTA, E., VAN DE WIEL, C. C. M., VOSMAN, B. & VAN DEN BERG, R. G. 1998. Phylogenetic relationships among *Lactuca* (Asteraceae) species and related genera based on ITS-1 DNA Sequences. *Amer. J. Bot.*, 85: 1517-1530.
- LACK, H. W. 2007. *Lactuca*. In: KADEREIT, J. W. & JEFFREY, C. (Eds.). *The Families and Genera of Vascular Plants*, Vol. VIII: *Asterales*. Berlin: Springer-Verlag. p. 180-198.
- LIOGIER, A. H. 1996. *Lactuca*. *La Flora de la Española*, vol. 8 part 29. San Pedro de Macoris: Universidad Central del Este. p. 1-588.
- RADLOFF, H. W. 1961. The taxonomy of *Lactuca* (Compositae) in North America, north of Mexico. 189p. Thesis (Phd) – Department of Plant Biology. University of Illinois, Urbana, 1961.
- ROBINSON, H., NORDESTAN, B., LUNDIN, R. & JØRGENSEN, P.M. 1999. *Asteraceae*. In: JØRGENSEN, M. P. & LEÓN-YÁNEZ, S. (Eds.). Catalogue of the Vascular Plants of Ecuador. *Monogr. Syst. Bot. Missouri Bot. Gard.*, 75: 260-314.
- SCHNEIDER, A. 2015. *Lactuca*. In: *Lista de Espécies da Flora do Brasil*. Available from: <<http://www.floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB80674>> Accessed in: 25 mar. 2015.
- SHI, Z. & KILIAN, N. 2011. *Lactuca*. In: WU, Z. Y., RAVEN, P. H. & HONG, D. Y. (Eds.). *Flora of China*, Vol. 20-21. Beijing & St. Louis: Missouri Botanical Garden Press. p. 235-236.
- SIMPSON, B. B. 2009. Economic importance of Compositae. In: FUNK, V. A., SUSANNA, A., STUESSY, T. F. & BAYER, R. J. (Eds.). *Systematics, Evolution, and Biogeography of Compositae*. Vienna: IAPT. p. 57-60.
- STROTHER, J.L. 2006. *Lactuca*. In: FLORA OF NORTH AMERICA EDITORIAL COMMITTEE (Eds.). *Flora of North America & North of Mexico*, Vol. 19. New York: Oxford University Press. p. 259-263.
- THIERS, B. 2015. Index herbariorum: A global directory of public herbaria and associated staff. Available from: <<http://sweetgum.nybg.org/ih/>> Accessed in: 10 may 2015.
- WANG, Z., PENG, H. & KILIAN, N. 2013. Molecular phylogeny of the *Lactuca* alliance (Cichorioideae, Subtribe Lactucinae, Asteraceae) with focus on their Chinese centre of diversity detects potential events of reticulation and chloroplast capture. *PLoS ONE*, 8 (e82692): 1-20. <<http://dx.doi.org/10.1371/journal.pone.0082692>>