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EUPHORBIA SUBILSIAE (EUPHORBIACEAE), A NEW SPECIES FROM ARGENTINA

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Abstract. Mayfield, M. H. 2024. *Euphorbia subilsiae* (Euphorbiaceae), a new species from Argentina. *Darwiniana*, nueva serie 12(1): 162-169.

A new species of *Euphorbia* that has been historically treated as *E. dentata* in Argentina is described and illustrated. The new species, *Euphorbia subilsiae*, is morphologically similar to *E. pentadactyla*, the only other native species of the "*Euphorbia dentata* alliance" in Argentina, but it has bifid styles and less brightly colored umbel bracts. *Euphorbia davidii*, long thought to be native in Córdoba Province, should be considered as recently introduced in Argentina. It is now a common weed across Buenos Aires Province but is apparently less common further north in the country. A discussion of the distinctions among these species and their taxonomic history in Argentina is presented.

Keywords. Argentina; *Euphorbia*; Taxonomy.

Resumen. Mayfield, M. H. 2024. *Euphorbia subilsiae* (Euphorbiaceae), una nueva especie de Argentina. *Darwiniana*, nueva serie 12(1): 162-169.

Se describe e ilustra una nueva especie de *Euphorbia* que históricamente ha sido tratada como *E. dentata* en Argentina. La nueva especie, *Euphorbia subilsiae*, es morfológicamente similar a *E. pentadactyla*, la única otra especie nativa del "*Euphorbia dentata* alliance" en Argentina, pero tiene estilos bífidos y brácteas de las umbelas de color menos brillante. *Euphorbia davidii*, que durante mucho tiempo se pensó que era nativa del área de Córdoba, debe considerarse como una especie introducida recientemente en Argentina. Esta especie actualmente es una maleza común en toda la Provincia de Buenos Aires, pero aparentemente es menos común más al norte del país. Se presenta una discusión de las distinciones entre estas especies y su historia taxonómica en Argentina.

Palabras clave. Argentina; *Euphorbia*; Taxonomía.

INTRODUCTION

In her 1977 treatment of the genus *Euphorbia* L. occurring in Argentina, Subils recognized seven species in section *Poinsettia* (Graham) Baill., two of which (*E. insulana* Vell. and *E. vervoostii* Subils) are now treated in different taxonomic subdivisions within the genus. Later, the same author added *E. davidii* (Subils, 1984), resulting in a total of six species for the section in Argentina, namely *E. cyathophora* Murr., *E. davidii* Subils, *E. dentata* Michx. (misapplied), *E. heterophylla* L., *E. kurtzii* Subils, and *E. pentadactyla* Griseb. Mayfield (1997), in an unpublished dissertation including the aforementioned species, treated members of *Euphorbia* subg. *Poinsettia* (Graham) House, following the circumscription of Dressler's (1962) genus *Poinsettia*, and the same group of species to which Yang et al. (2012), in a phylogenetic study, applied the name *Euphorbia* subsection *Stormieae* Croizat. In that study, Mayfield subdivided subg. *Poinsettia* into two species alliances, one of which he named the "*Euphorbia dentata* alliance" a group of seven species with mostly opposite, coarsely dentate leaves with arcuate venation, and carunculate seeds. Among the Argentinian species of this alliance, the author recognized *E. davidii* and *E. pentadactyla* and proposed recognition of an undescribed species named "*E. subilsiae*"

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which was applied to those specimens that Subils (1977), and later Marchessi et al. (2011), treated as "*E. dentata*". Notably for Argentina, the author also considered *E. davidii* to be introduced and did not consider *E. dentata* to occur there. The primary intent of this paper is to describe the new species and to provide a morphological comparison among its closely related congeners, members of the "*Euphorbia dentata* alliance" in Argentina. A key to the Argentinian species of section *Poinsettia*, all belonging to subsection *Stormieae* (Yang et al., 2012), is also provided. A brief discussion of the taxonomic history of *E. dentata* and *E. davidii* as it relates to Argentinian specimens is also presented.

MATERIALS AND METHODS

Standard herbarium study of specimens was conducted, focused on *Euphorbia* subsection *Stormieae*, using the circumscription of *Euphorbia* subgenus *Poinsettia* by Dressler (1962). A total of 73 out of 3859 different collections examined (many of which had several duplicates) were from Argentina. All specimens were annotated in 1997 according to the taxonomy in Mayfield (1997). To understand the contemporary distributions of *E. davidii* and *E. subilsiae* in Argentina, all verifiable observation records from iNaturalist (iNaturalist Community 2024) were filtered to return all records identified to the iNaturalist category "*Euphorbia dentata* complex" in Argentina (the iNaturalist category "*Euphorbia dentata* complex" includes records identified as: "*Euphorbia dentata* complex," *E. davidii*, *E. subilsiae*, and *E. pentadactyla* in Argentina). These georeferenced records were downloaded to a CSV file from iNaturalist (n=78) and identified according to the taxonomy of Mayfield (1997), then the distributions corresponding to the observations of *E. davidii* (n=47) and *E. subilsiae* (n=27) were plotted using ArcGIS online (ArcGIS.com). Records were eliminated where the locality was obscured (n=1). All downloaded records of the target taxa were clearly identifiable based on the images in iNaturalist. All observations have also been annotated by this author (username: "spurgeckr") directly within iNaturalist.

RESULTS

Euphorbia subilsiae Mayfield, **sp. nov.** TYPE: Argentina. Córdoba: Dpto. Río Primero, Estancia San Teodoro, 3 Nov 1955, *A. T. Hunziker 10859* (holotype, CORD!; isotype, TEX!). Fig. 1.

Annual taprooted herbs to 10-55 cm tall. Roots 8-17 cm long. Stems: solitary, mainstems erect, 2.5-3.5 mm in diameter at the base; branches opposite, ascending, with spreading, villous vestiture, the trichomes of various lengths from 0.5-1.8 mm long, nonuniformly distributed, concentrated at the nodes and on the uppermost branchlets; internodes mostly 5-12 cm long; nodes with stipular glands above the petioles. Leaves: opposite or subopposite on the uppermost stem nodes; petioles 5-17 mm long, with a narrow decurrent wing ca. 0.5 mm wide extending from the blade, with long spreading trichomes scattered along the abaxial midrib, short strigose above; blades (2-)3.5-7.5 × 0.8-3 cm, lanceolate, or elliptic to narrowly elliptic; bases angustate, apices narrowly acute to acuminate; margins remotely and obscurely crenate-serrate, less often prominently crenate-dentate, occasionally subentire, teeth concentrated in the upper half, 5 to 10 on each side, terminating with a gland; abaxial surfaces sparsely villous, the trichomes concentrated along the veins; adaxial surfaces sparsely low pilose, antrorsely strigillose along the adaxial margins; venation arcuate, primary lateral veins arcuate, ascending along the leaf margins. Inflorescence: an open terminal dichasial umbel with three spreading primary rays subtended by ray leaves, each ray dichasially branched 2-4 times, with 3-7 involucres per primary ray; primary ray leaves more or less like the stem leaves; primary rays up to 5 cm long; bracts of the umbel narrowly elliptic, mostly green, and becoming pale yellow-green or whitish at base, the uppermost bractlets reduced and thicker, carinate and acicular, 5-12 mm long, with conspicuous, marginal tooth-glands. Involucres green, cylindric, glabrous, 2-2.2 ×1.5-2 mm, on peduncles 1.2-2 mm long; involucral lobes erect, ca. 0.5-0.7 mm long, green or whitish, fimbriately 4-5-lobulate, lobules to ca. 0.3 mm tall, alternating with short linear vestigial glands; glands usually one per involucre, flattened dorsiventrally and somewhat bilabiate, the outer margin greenish-yellow and slightly protruding, the stipe broadly attached to somewhat stalked on the involucre, 0.8-1 × 0.9-1.1 mm; lateral bracteoles finely divided, with glandular apices, plumose from below; staminate flowers ca. 25-35; stamens ca. 0.4 mm long, anthers exserted, pollen yellow; pistillate pedicel elongating during pistil maturation; ovary glabrous; styles green, 0.7-0.9 mm long, free essentially to the base, bifid almost to the base (though often connivent), strongly divergent; fruiting pedicels 4.7-5 mm long, first arching over the side of the involucre, becoming erect at maturity. Capsules: green, often infused with red, elongate-spheroid, broadest about the middle, 4-4.3 × 4.2-4.4 mm. Seeds: dark brown (nearly black) when mature, 2.7-3.1 × 2-2.4 mm,

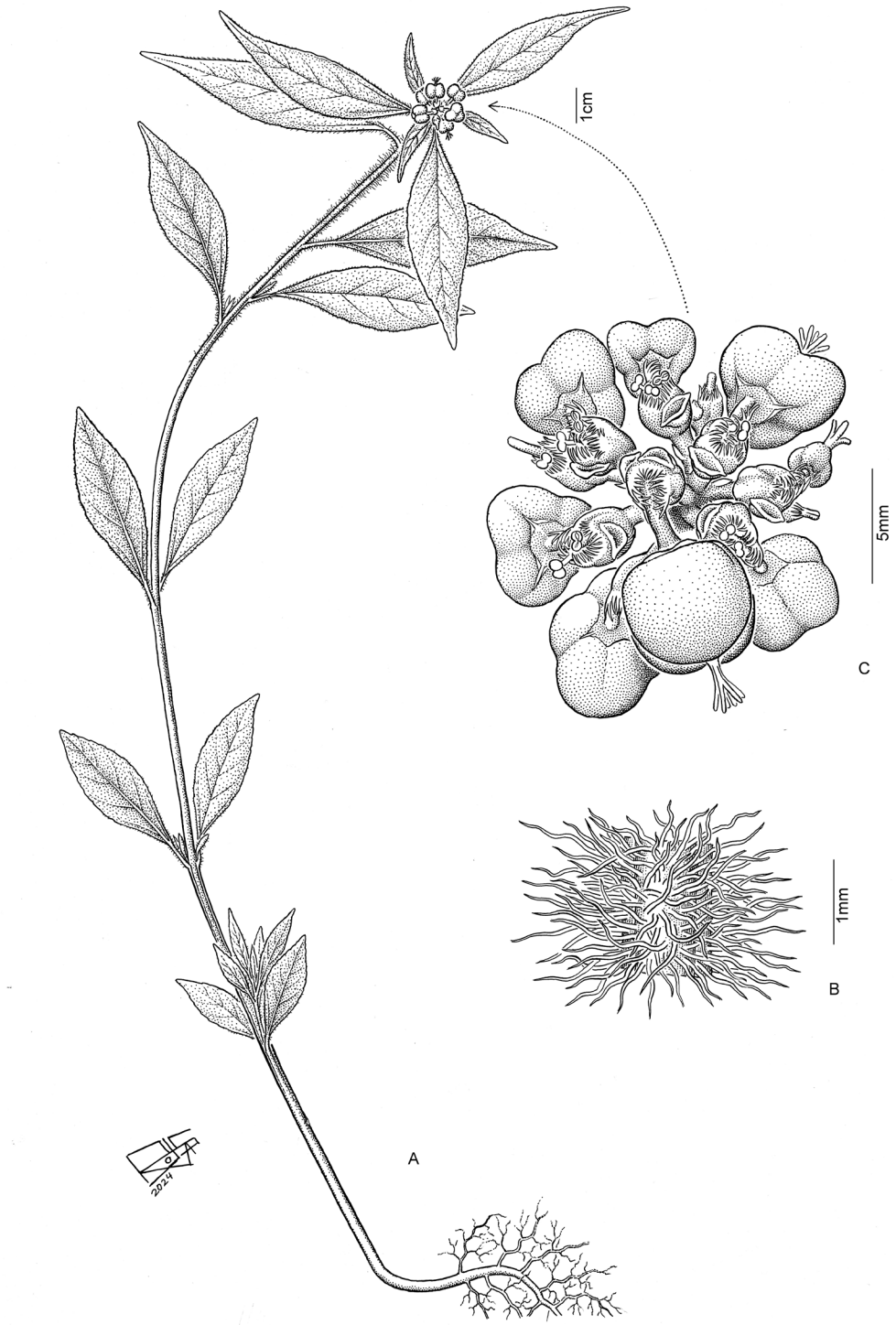

Fig. 1. *Euphorbia subilsiae.* **A.** Habit. **B.** Upper stem detail showing vestiture. **C.** Inflorescence showing umbellate arrangement of dichasia of cyathia. Note the single involucral gland and fimbriate lobes on individual cyathia. **A-C** from *Zuloaga et al. 11617* (SI).

oblong-ovoid, broadest below the middle, apex bluntly conic, base narrowed, depressed truncate, obtusely-quadrangular in cross-section, surfaces with irregularly spaced blunt protuberances, dorsal facet with a distinct transverse ridge below the middle extending around to the ventral facet (Fig. 2), with an obscure secondary ridge above the middle; ventral facets warty and more or less flat or sunken except for the transverse ridge; caruncle U-shaped, umbonate, 0.4-0.5 mm wide.

Iconography. Subils (1984, Fig. 2-D, E, F & G)

Vernacular names. "Lecherón de Rosa".

Etymology. The species is named in honor of Rosa Subils in recognition of her significant taxonomic contributions to the *Euphorbia* of Argentina. The vernacular name is proposed to distinguish it from the common weedy "lecherón" of Argentina: *Euphorbia davidii*

Chromosome number. n=28 (Subils, 1977, identified as *E. dentata*, *Subils 704* [CORD]).

Distribution and habitat. Endemic in Argentina, in foothills of the eastern slopes of the mountain ranges from the provinces of San Luis to southern Jujuy; apparently disjunct in northern Buenos Aires, Entre Ríos, and Santa Fe provinces (verified iNaturalist observations: Ameglio, 2021; Beltrocco, 2020; Siempreverde, 2022). Fig. 3.

Observation. Flowering November-March; fruiting until May.

Examined material. ARGENTINA. **Buenos Aires**. Pdo. Pergamino, El Socorro, 8-XI-1926, *L. R. Parodi 7379* (GH). **Córdoba**. Córdoba, XII-1891 (fr), *O. Kuntze s.n.* (US); Dpto. Capital, Ciudad de Córdoba, Barrio Groppo, 1-III-1950 (fr), *A. T. Hunziker 8145* (F, NY); Dpto. General San Martin, Ruta Nacional 158, entre Luca y Dalmacio Vélez Sarsfield en Estancia Patria, 18-I-1956 (fl, fr), *A. T. Hunziker 11574* (TEX); Sierra Chica, San Roque, 12-I-1897 (fl, fr), *G. H. E. W. Hieronymus s.n.* (NY); Dpto. Unión, Bell Ville, orillas del Canal Litín, intersección con ruta 9, 5-III-1987 (fr), *S. Ferrucci 591* (A, MICH); Dpto. not indicated, Sierra Chica, Estancia la Reducción, 27-XII-1935 (fl, fr), *A. Burkart 7300* (F). **Jujuy**. Dpto. Tumbaya, Volcán, 13-II-1927 (fl, fr), *S. Venturi 4848* (GH, US); Dpto. Dr. Manuel Belgrano, Ruta Provincial 29 a Tiraxi, 13-II-2010, *F. O. Zuloaga et al. 11617* (SI). **Salta**. Dpto. Guachipas, Rte. 9 off of Rte. 68, Salta to Cafayate, ca 22 km SW of La Viña on Rta. 9, Cuesta del Cebilar, 9-II-1994 (fl), *J. Saunders de Palacios et al. 3307* (TEX); Dpto. Rosario de la Frontera, Los Baños, 900 m., 10-VI-1928 (fr), *S. Venturi 6464* (US); Río Blanco, 10-II-1941 (fl, fr), *T. Meyer 3649* (F). **Tucumán**. Dpto. Tafí Viejo, Siambón, Sierra de Tucumán, 18-I-1873, *P. G. Lorentz & G. H. E. W. Hieronymus 1065* (F NY); Cadillal a Tapia, 1921, *R. Schreiter 1573* (GH).

Euphorbia subilsiae is easily distinguished from all other similar Argentinian species of *Euphorbia* by its combination of erect habit, mostly opposite, dentate, acute to acuminate leaves, umbel bracts mostly green with faintly white bases, bifid style branches, narrowly triangular seeds with small umbonate caruncle, and long pilose stems (Fig. 1). It shares most of these features with *E. pentadactyla*, but the latter has more copiously white bract bases, and filiform, unbranched styles. Both *E. pentadactyla* and *E. subilsiae* differ from the five North American species of the *E. dentata* alliance in having leaves with generally longer petioles, leaf blades more nearly elliptic and often with an acuminate apex, a long soft pilose to villous vestiture on the stems, petioles, and the abaxial surfaces of the leaves (longer trichomes averaging about 1.7 mm long), and taller, narrower seeds. In addition, they lack the uniform close pilosity found on the upper stems (in addition to sparser, longer trichomes) of all the North American species of the *Euphorbia dentata* alliance. Mayfield (1997) described this as a "bistrate" vestiture (i.e., having two distinct vestiture layers). Subils (1984) and Marchessi et al. (2011) have also pointed out that both of the native Argentinian species (*E. pentadactyla* and *E. subilsiae*) have gland-tipped bracteole divisions (the bracteoles of section *Poinsettia* species are divided, plumose proliferations from the fused margins of the involucres, and they separate and enclose the five axes of staminate flowers before they emerge). In contrast, the bracteoles are eglandular in *E. davidii* and in the remainder of the North American species of the *E. dentata* alliance.

Seed morphology provides the hardest evidence for distinguishing among all the members of the *E. dentata* alliance. For the Argentinian species, this is especially true for the distinction between *E. davidii* and both *E. pentadactyla* and *E. subilsiae*, each of which has relatively taller, narrower seeds with a punctate or umbonate caruncle, as well as a prominent transverse ridge on the dorsal side (see Fig. 2 for seeds of *E. subilsiae*). In Fig. 2, *Euphorbia pentadactyla* is not included simply because its seeds are overall very similar to *E. subilsiae*. The figures of *E. dentata* and *E. davidii* from North American specimens show that both species have seeds that are more broadly ovoid in outline rather than oblong-ovate (as in *E.*

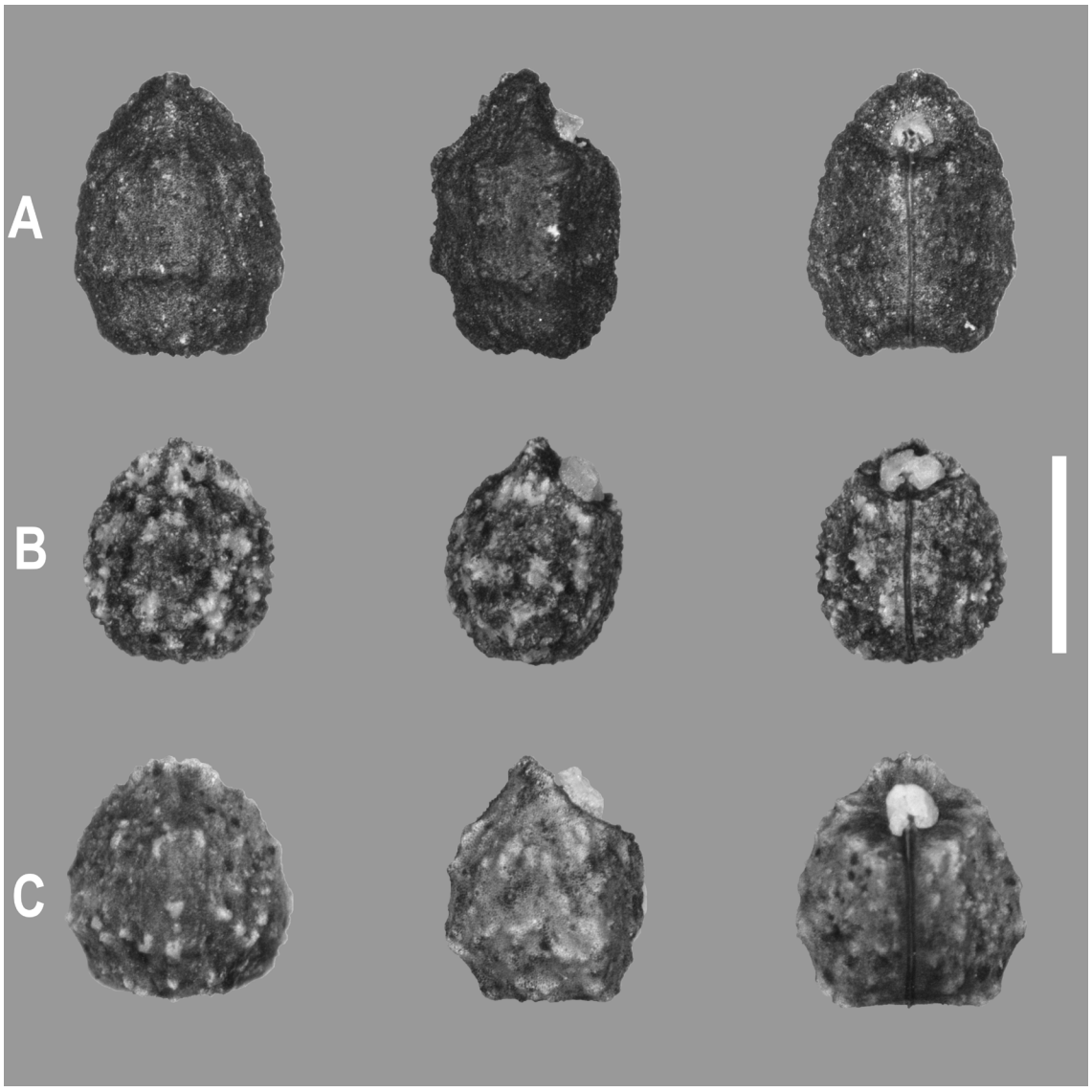

Fig. 2. A, top row, mature seed of *Euphorbia subilsiae*; from *Venturi 6464* (US). **B,** middle row, mature seed of *E. dentata***,** from *Lange 9* (KSC). **C,** bottom row, mature seed of *E. davidii*, from *Davis 430* (KSC). Views: left column, dorsal view; middle column, lateral view; right column, ventral view. Scale bar = 2 mm.

subilsiae). They each also have larger reniform caruncles. *Euphorbia dentata* differs from both *E. subilsiae* and *E. davidii* in having seeds that have a rotund shape, with a rounded transition between the dorsal and ventral facets, and a more uniformly and sharply sculptured surface. It also lacks any suggestion of a dorsal transverse ridge. *Euphorbia davidii* differs from *E. dentata* by its more angular facets with an irregularly warty surface, and from *E. subilsiae* by its broad, ovoid outline.

Taxonomic history of the "*Euphorbia dentata* alliance" in Argentina. The first species of the *Euphorbia dentata* alliance described for Argentina was *E. pentadactyla* (1879), the most easily recognized of the species in Argentina. *Euphorbia davidii* was then described as a species in Argentina by Subils (1984), who described its differences in comparison to the native species of *Euphorbia* (most notably, to *E. subilsiae* which she identified as *E. dentata*). Subsequently the name *E. dentata* has continued

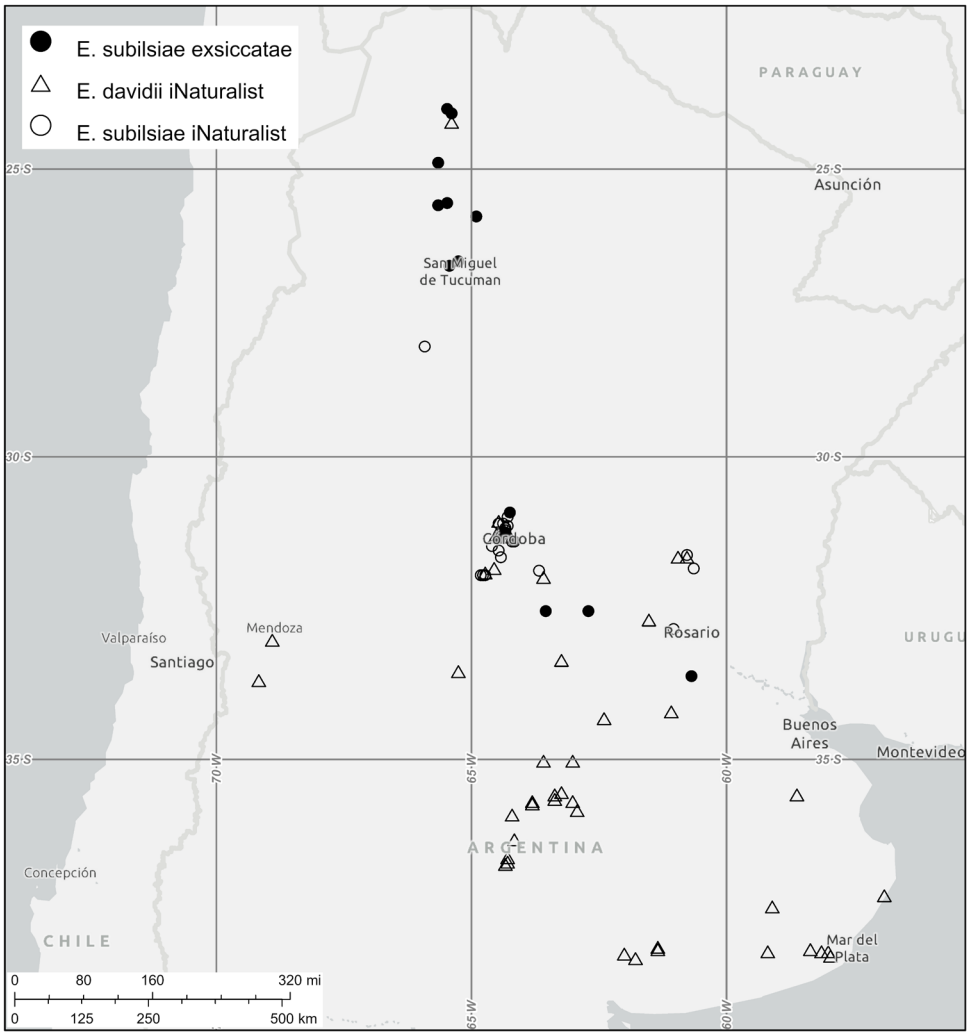

Fig. 3. Map showing the distributions of *E. subilsiae* (solid circles are from herbarium specimens, open circles show iNaturalist records) and *E. davidii* (open triangles show iNaturalist records only).

to be applied to specimens of *E. subilsiae*, and to many populations of *E. davidii*, due to lack of understanding of the differences among these species (see Marchessi et al. [2011] for a detailed account of these differences). This confusion has resulted in misrepresentation of the ranges of both species in worldwide databases (such as POWO [2024]) which show Argentina as part of the native range of the species. Mayfield (1997) described the distribution of *E. davidii* as "central USA to northwestern Mexico; especially abundant in the central Great Plains of the USA; more broadly distributed in North America as a waif along railroad tracks and now apparently becoming established in Argentina in South America and Australia." However, it has since been widely assumed to be native in Argentina, primarily because it was first described at species rank from there. This misconception about the native range of *E. davidii* has been broadly propagated since the native range in North America was misrepresented by Kartesz (2015), who regarded most of the range in the United States of America and Canada as introduced. While it is true that *E. davidii* has expanded within North America beyond its likely native range, specimen data support its nativity from northern Mexico and western Texas to Wyoming (possibly also Utah) and east to Missouri and Minnesota. Moreover, a South American origin (or amphitropic distribution) of *E. davidii* seems unlikely given the fact that the earliest Argentinian collection

known is from 1974, from Buenos Aires Province as a weed from a cultivated field (*Gómez Álzaga 14359*). A search of GBIF records has not revealed earlier collections of *E. davidii* from Buenos Aires Province despite clear evidence of its present abundance there as detailed in Marchessi et al. (2011). Also, numerous recent observation records examined during this study attest to its contemporary abundance in the same province (iNaturalist, 2024). It is therefore likely that the northern populations of *E. davidii* in Argentina made their way from the south, where there is earlier evidence of introduction. To be sure, there are probably many misidentified collections in herbaria that may refine this history, but they need to be annotated carefully (e.g., a 1943 collection of *E. subilsiae* from Salta province (*Bartlett 19721*, MICH-1280695, image!) is misidentified as *E. davidii*. By contrast, specimens of *E. davidii* verified by the present author from North America (GBIF, 2024) show it was widely collected during the latter half of the 19th century from northern Mexico, the southwestern United States of America, across the Great Plains to Missouri.

It is also important to note that *E. aureocincta* Croizat, with a type from Argentina, is widely cited (following Dressler, 1962) as a synonym of *E. dentata*. Examination of the holotype determined this name to be a synonym of *E. heterophylla* (Mayfield, 1997). Thus, there are no synonyms of *E. dentata* from Argentina, and the only known synonyms from the native range of *E. davidii* are the infraspecific epithets *E. dentata* var. *gracillima* Millsp. (type from Arizona) and *E. dentata* var. *lancifolia* Farwell (type from Wisconsin).

Key to the species of *Euphorbia* subsection *Stormieae* in Argentina

1. Plants with alternate leaves; leaves with entire (sometimes lobed) margins, lacking rounded marginal crenae, seeds without a conspicuous caruncle, (< 0.1 mm wide; examine several seeds to be sure the caruncle hasn't fallen off) ……2

1. Plants with opposite leaves, leaves with crenate margins (the teeth sometimes inconspicuous); seeds with a conspicuous caruncle (> 0.3 mm wide)……4

2(1). Umbel leaf blades with a well-defined coral red, pink, or rarely white zone at the base below the green outer portion……*E. cyathophora*

2. Umbel leaf blades uniformly green throughout, or gradually paler (yellowish to whitish) towards the base ……3

3(2). Umbel leaves basally pale or yellowed; glands of the involucre with a rounded rim; seeds angular, with a longitudinal ridge along the dorsal midline……*E. heterophylla*

3. Umbel leaves uniformly green; glands of the involucre with an oblong rim, flattened dorsiventrally; seeds cylindroid, rounded along the dorsal midline……*E. kurtzii*

4(1). Style branches linear-filiform, entire……*E. pentadactyla*

4. Style branches bifid ……5

5(4). Plants with soft hirsute to villous vestiture, trichomes spreading, the longest more than 1.5 mm long; seed narrowly pyramidal, much longer than wide……*E. subilsiae*

5. Plants with coarse vestiture, trichomes descending, the longest less than 1 mm long; seed broadly ovoid, about as long as wide, or slightly longer……*E. davidii*

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