

## TAXONOMIC NOTES AND NEW COMBINATIONS IN NORTH AMERICAN *SENEGA* (POLYGALACEAE)

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### Abstract

**Background:** The recently segregated genus *Senega* (DC.) Spach (Polygalaceae), formerly known as the “Polygala New World clade,” currently comprises 238 species. In the course of revising North American species, three overlooked names previously assigned to *Polygala* were identified as requiring transfer to *Senega*.

**Studied species:** *Senega arenicola*, *S. pterocarya*, and *S. turgida*.

**Study site:** Mexico.

**Methods:** Examination of MEXU herbarium specimens and critical analysis of diagnostic morphological characters.

**Results:** These new combinations are presented here with updated descriptions, taxonomic notes, photographic plates, and distribution maps. Notably, *S. pterocarya* displays a rare case of single-fruit diplochory: one locule is indehiscent and anemochorous, while the other is dehiscent and myrmecochorous, representing a unique dispersal strategy in Polygalaceae. *Senega turgida*, is recognized here as distinct from *S. aparinoides* based on differences in seed and floral morphology, as well as its fleshy leaves.

**Conclusions:** This study contributes to the taxonomic clarification of *Senega* by transferring three overlooked species from *Polygala* and providing updated morphological, ecological, and distributional data. It also reveals remarkable evolutionary traits, such as the case of diplochory in *S. pterocarya* and the distinct morphological features separating *S. turgida* from its close relatives.

**Key Words.** diplochory, Mexico, Polygala New World clade, sect. *Verticillatae*, *Senega dolichocarpa*, subgenus *Monninopsis*.

### Resumen

**Antecedentes:** El recientemente segregado género *Senega* (DC.) Spach (Polygalaceae), antes conocido como el clado “Polygala New World clade”, comprende actualmente 238 especies. Durante la revisión de las especies norteamericanas, se identificaron tres nombres previamente asignados a *Polygala* que requieren ser transferidos a *Senega*.

**Especies estudiadas:** *Senega arenicola*, *S. pterocarya* y *S. turgida*.

**Sitio de estudio:** México.

**Métodos:** Revisión de los especímenes del herbario MEXU y análisis crítico de caracteres morfológicos diagnósticos.

**Resultados:** Se presentan aquí nuevas combinaciones junto con descripciones actualizadas, notas taxonómicas, láminas fotográficas y mapas de distribución. Además, *S. pterocarya* presenta un caso particular de diplocoria: un lóculo del fruto es indehiscente y anemocórico, mientras que el otro es dehiscente y mirmecocórico, representando una estrategia de dispersión única en Polygalaceae. *Senega turgida* es reconocida aquí como distinta de *S. aparinoides* sobre la base de diferencias en la morfología de sus semillas y flores, así como por sus hojas carnosas.

**Conclusiones:** Este estudio contribuye a la clarificación taxonómica de *Senega* al transferir tres especies desde *Polygala* y proporcionar datos morfológicos, ecológicos y de distribución actualizados. También revela notables rasgos evolutivos, como la diplocoria en *S. pterocarya* y los rasgos morfológicos distintivos que separan a *S. turgida* de sus parientes cercanos.

**Palabras clave.** Diplocoria, México, Polygala New World clade, secc. *Verticillatae*, *Senega dolichocarpa*, subgénero *Monninopsis*

**S***enega* (DC.) Spach (Polygalaceae), comprising currently 238 species (including the three species here treated), was recently segregated from *Polygala* L. (Pastore *et al.* 2023, Martinez 2023, Pastore & Mota 2024). The genus *Senega* includes all members of the former ‘Polygala New World clade,’ as described by Pastore *et al.* (2019), occurring in the New World, from Canada to southern Argentina, with a few species from continental Africa and Madagascar. The genus *Senega* in North America has mainly been studied from United States species, with a recent treatment in the Flora of North America for Polygalaceae (Abbott 2021). A few species and taxonomic notes for *Senega* (then part of *Polygala*) in Mexico have also been published in recent decades (Wendt 2005). During recent studies on the genus *Senega* in North America, especially during a visit to the MEXU herbarium by the first author and collaboration with co-authors of this paper, some necessary taxonomic and nomenclatural updates became apparent. The reinstated taxa are illustrated and distribution maps are provided, along with taxonomic notes. Here we present three new combinations in *Senega* for *Polygala arenicola* Small (*Senega smallii* (R.R.Sm. & D.B.Ward) J.F.B.Pastore & J.R.Abbott), *P. pterocarya* Chodat, and *P. turgida* Rose.

### Material and methods

Most of the specimens studied are deposited in MEXU, and also the following herbaria were visited for this study: BM, BR, G, HAL, NY, and P (acronyms follow Thiers 2025, continuously updated). A database of specimens’ geographic coordinates was built using locality data from herbarium labels. Species distribution maps were produced using QGIS v. 3.18.1 (QGIS Development Team 2021) and Corel® PHOTO-PAINT™ X7. Descriptions and measurements were made using a binocular stereoscope (Tecnival) with an attached camera in Curitiba (SC, Brazil); floral parts were photographed using ToupView®, with images taken on a black background and edited in Corel® as above, which was also used to compose the photographic plates.

### Results

*Senega arenicola* (Small) J.F.B.Pastore & J.R.Abbott, comb. nov. (Sect. *Decurrentes* (Chodat) J.F.B.Pastore & J.R.Abbott).

*Type.* U.S.A., Florida, Dade Co., 31/10-04/11/1903, *J. K. Small & J. J. Carter 1276* (lectotype, designated by Smith & Ward (1976: 308): NY [bc] NY00021275!; isolectotypes: PH-01049939 [bc] PH00047164!, US-955384 [bc] US00289405!).

≡ *Pilostaxis arenicola* Small, Man. S.E. Fl. [Small] 773. 1933.

≡ *Polygala arenicola* Small, Add. Fl. Subtrop. Florida 426. 1905. nom. illeg.

≡ *Polygala smallii* R.R.Sm. & D.B.Ward, Sida 6(4): 307. 1976.

≡ *Senega smallii* (R.R.Sm. & D.B.Ward) J.F.B.Pastore & J.R.Abbott, Ann. Missouri Bot. Gard. 108: 165. 2023. nom. illeg.

*Nomenclatural notes.* *Polygala arenicola* Small (1905) is a later homonym of *P. arenicola* Gürke (1903). Subsequently, Small (1933) transferred this species to the genus *Pilostaxis* Raf., publishing the replacement name *Pilostaxis arenicola* Small. Since *Polygala arenicola* Small is an illegitimate name due to homonymy, *Pilostaxis arenicola* is treated as a replacement name (*nomen novum*) under Article 58.1 of the *International Code of Nomenclature for algae, fungi, and plants* (ICN, Turland *et al.* 2025). Later, Smith & Ward (1976) proposed *Polygala smallii* as a replacement name for the same taxon as the generic name *Pilostaxis* Raf. (Rafinesque 1838) is superfluous and illegitimate, being a later synonym of *Pylostachya* Raf. (Rafinesque 1834). However, this does not affect the legitimacy of the epithet *arenicola*, which remains available for use in other combinations. Nevertheless, when Pastore *et al.* (2023) transferred *Polygala smallii* to the genus *Senega*, they overlooked the nomenclatural situation whereby *Pilostaxis arenicola*, having priority over *Polygala smallii*, was available for combination in *Senega*. By including *Pilostaxis arenicola* as a synonym of *Senega smallii*, they inadvertently rendered the latter name illegitimate (ICN, Turland *et al.* 2025). Thus, a new combination, *Senega arenicola*, is needed and here provided.

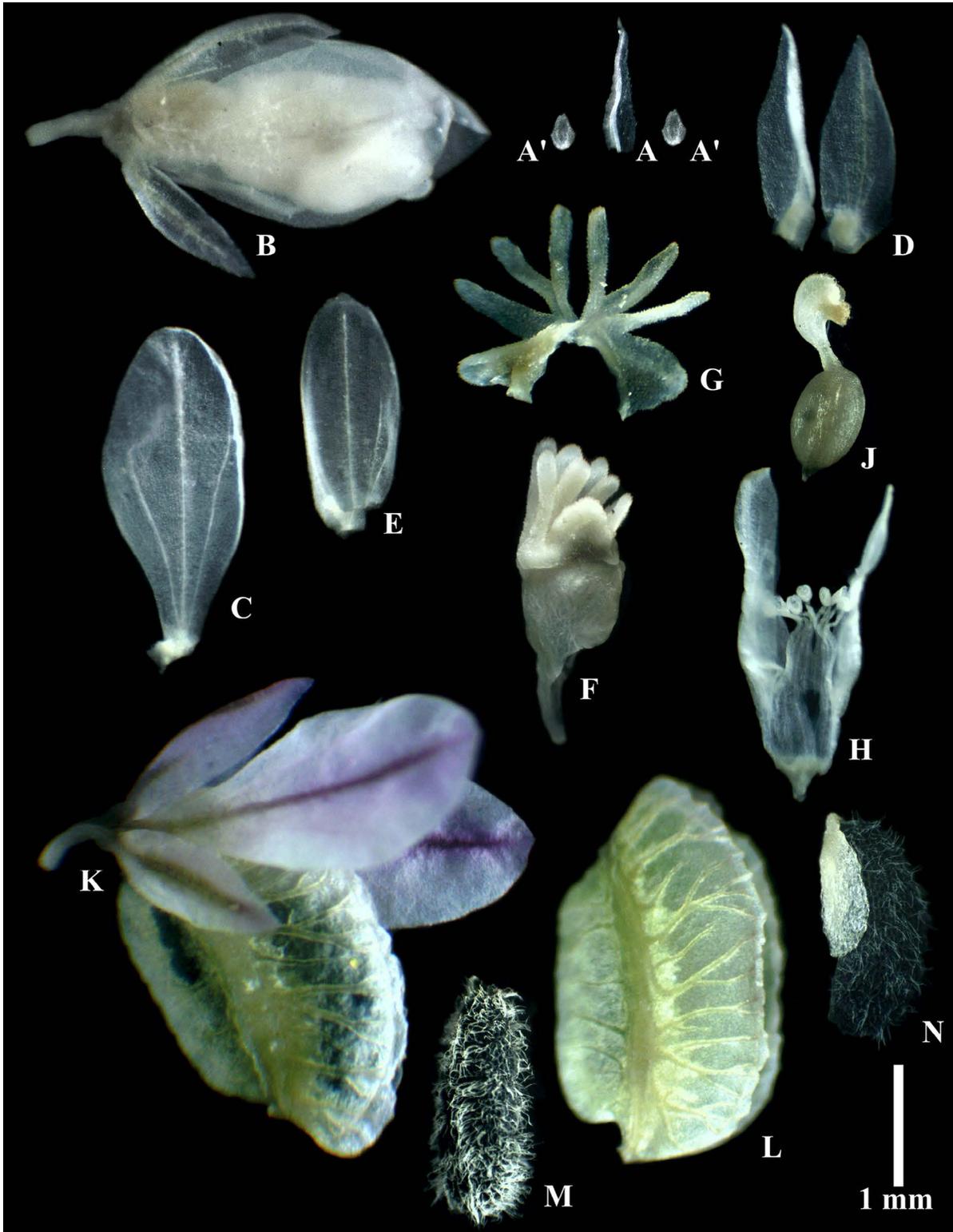
*Senega pterocarya* (Chodat) J.F.B.Pastore & R.M.Fonseca. comb. nov. ([Figure 1](#))

*Type.* Mexico, Oaxaca, San Cristóbal Amoltepec, 08/12/1898, *E. Seler & C. Seler 1462* (holotype, B<sup>†</sup>). Neotype. Mexico, Oaxaca, Tlaxiaco, San Pedro Molinos, Km 64 de la carretera Tlaxiaco-Putla, 17° 13' 34.1" N; 97° 43' 10.6" W, 3/08/1997, *J. L. Panero & I. Calzada 4436* (neotype, designated here: MEXU [MEXU799968]!; isoneotypes: IEB [IEB99437] n.v., TEX [TEX00029454] n.v.).

≡ *Polygala pterocarya* Chodat, Bot. Jahrb. Syst. 52(1-2, Beibl. 115): 83. 1914.

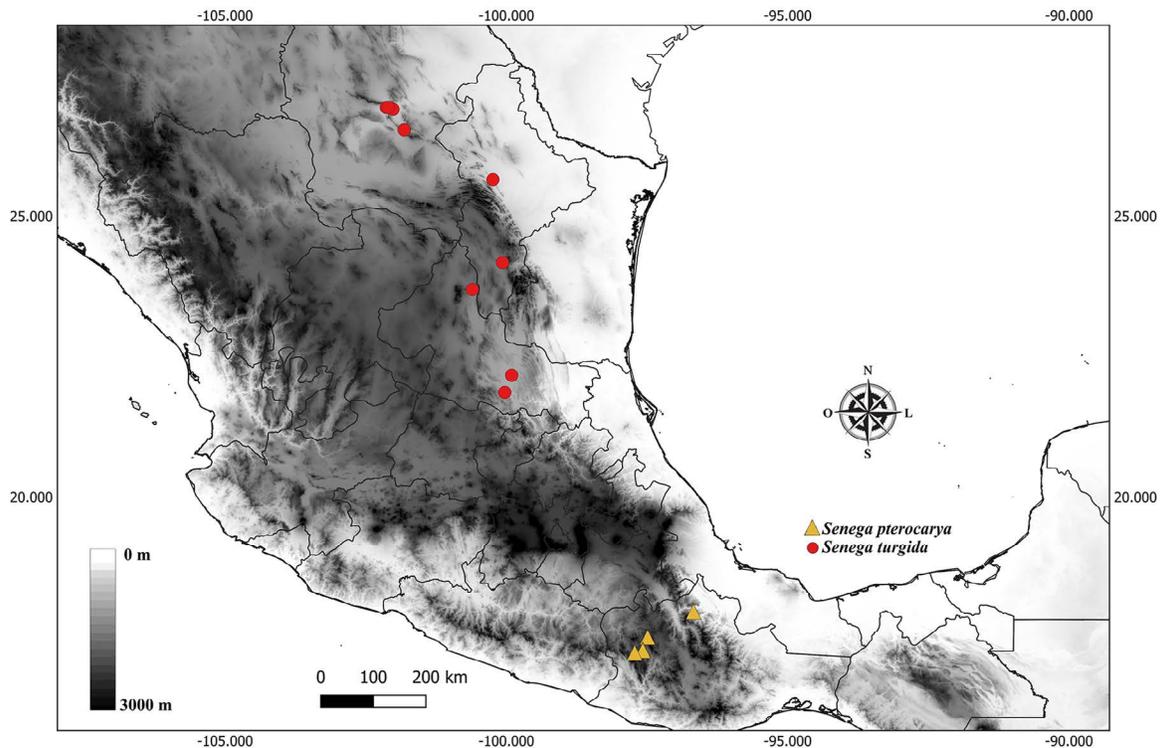
*Description.* Annual or biennial herbs, erect, 15-20 cm tall; roots slender to thick; stems numerous, arising from the base (caespitose), or 2-3- branched above the ground when young, cylindrical, striated, pubescent with glandular trichomes, stems green without yellowish glands forming spots. Leaves all alternate, subsessile, chartaceous, lamina 0.6-1.6 × 0.2-0.3 cm, linear-lanceolate, apex acute, base cuneate, margin revolute, surface densely puberulous, covered with short clavate trichomes. Racemes spiciform, 4-4.2 × 0.6-0.7 cm, sometimes with scars of shed fruits, to 6.1 cm, subax; bracts ca. 1.1 × 0.3 mm, lanceolate, apex acute, ciliate at margins, without spots, caducous before anthesis, ca. 3 times longer than the bracteoles; bracteoles ovate to lanceolate, not ciliate; pedicel 0.7 mm long, glabrous. Flowers lavender with violet stripes on the wings, ca. 3.7 mm long; outer sepals not ciliate without spots at the base; lower outer sepal 1.5-1.6 × 0.6-0.7 mm, lanceolate, with acute apex; upper outer sepals 1.8 × 0.8 mm, oblong-elliptic, with apex obtuse, free from each other almost to the base; inner sepals (wings) 2.5 × 1.1 mm, oblanceolate, slightly asymmetric, with a rounded apex and narrow, cuneate base; with one central vein and two prominent secondary veins, margins not ciliate, shorter than the mature fruits. Keel ca. 2.4 mm long, apex cristate, without spots around the dorsal central vein, caducous when mature fruits; crest 1 mm long, 6-8-lobed; hood 0.7-0.8 mm long, claw 0.7 mm long; lateral petals 2.4 (ca. 1.6 free portion) × 0.4 mm, glabrous. Style 0.8 mm long, with an uncinat apex and a dorsally thickened distal portion, bearing a pre-stigmatic cavity located just above the stigma; two more or less erect, parallel flaps present on each side of the cavity; the external surface of the dorsal wall of the pre-stigmatic cavity is covered with short trichomes; ovary 0.9 × 0.5 mm, ellipsoid, glabrous, without glands on the surface. Capsule 2.8-3.5 × 1.6-2 mm, obliquely oblong, strongly asymmetrical, abaxial locule indehiscent and slightly winged, adaxial locule dehiscent with a prominent membranous wing; surface with numerous secondary veins radiating from the central nerve and branching dichotomously. Seeds from the dehiscent locule and from the indehiscent locule different in size and shape, puberulous, densely covered with short trichomes; seed from the dehiscent locule 1.75-1.9 × 0.64-0.72 mm, asymmetrical, ellipsoid, with a membranaceous, oblong, elaiosome formed by two lobes connate for most of their length, reaching two-thirds the length of the seed; seed from the indehiscent locule ca. 1.8 × 0.7 mm, oblong-ellipsoid, slightly asymmetrical, lacking an elaiosome ([Figure 1](#)).

*Additional specimens examined.* Mexico. Oaxaca. Región Cañada, San Andrés Teotilalpam, Santa Cruz Teotilalpam, 17° 58' 1.9" N; 96° 41' 01" W, 24/11/2004, *C. A. Cruz Espinosa & G. Juárez García 1900* (MEXU); Región Cañada, San Juan Bautista Cuicatlán, 6 km al N de Cuicatlán por la carret. 131, y 16 km al W por la terracería que va rumbo a San Pedro Jocotipac. Ecotonía de selva baja caducifolia-encinar, [17° 49' 47" N; 97° 00' 44" W], 19/08/1987, *T. Salinas et al.* 4309 (MEXU, MO); Región Mixteca, Asunción Nochixtlán, Distrito Nochixtlán, Yucudahuico, Las Multas, a 25 metros del arroyo. 17° 33' 10.1" N; 97° 19' 24" W, 30/08/2012, *A. Ibarra et al.* 353 (MEXU); Región Mixteca, Heroica Ciudad de Tlaxiaco, Mountain slopes near Tlaxiaco, 17° 17' 40" N; 97° 39' 31" W, 16/12/1936, *W. H. Camp 2203* (US); Región Mixteca, Heroica Ciudad de Tlaxiaco, Tlaxiaco. San Pedro Molinos. Km 64 de la carretera Tlaxiaco-Putla, 17° 13' 34.1" N; 97° 43' 10.6" W, 03/08/1997, *J. L. Panero & I. Calzada 4436* (IEB, MEXU, TEX); Región Mixteca; San Pedro y San Pablo Teposcolula, Distrito Teposcolula, cerros a 0.5 km al SO de Teposcolula, 17° 30' 11" N; 97° 29' 50.20" W, 26/7/1985, *D. H. Lorence et al.* 4588 (CTBS, MEXU); Región Mixteca, San Pedro y San Pablo Teposcolula, Dto. Teposcolula, entrada a la zona arqueológica Pueblo Viejo, cima del cerro, ca. de la casa del Sr. Carlos López. Juego de pelota, 17° 29' 56" N; 97° 28' 03" W, 17/09/2005, *A. García-Mendoza 7924* (MEXU); Región Mixteca; San Pedro y San Pablo Teposcolula, Distrito Teposcolula, a 20 m del entronque a Pueblo Viejo de Teposcolula Yucundaá, 17° 29' 59" N; 97° 27' 25" W, 03/08/2006, *A. García-Mendoza 8609* (MEXU).



**Figure 1.** *Senega pterocarya* (Chodat) JFB Pastore & RM Fonseca. A bract; A' bracteoles; B flower; C wing (one of the inner sepals); D upper outer sepals; E lower outer sepal; F keel; G crest; H lateral petals, and androecium; J gynoecium; K capsule with sepals and calyx persistent; L capsule (sepals removed); M seed from the non-winged locule without elaiosome; N seed from winged locule with elaiosome. From *Lorence* 4588 (CTBS). Photos: JFB Pastore.

*Distribution.* *Senega pterocarya* is known from southern Mexico, with records from the State of Oaxaca (regions of Cañada and Mixteca) (see [Figure 2](#)).



**Figure 2.** Distribution map of *Senega pterocarya* (Chodat) JFB Pastore & RM Fonseca (yellow triangles), and *S. turgida* (Rose) JFB Pastore & RM Fonseca (red circles).

*Etymology.* The specific epithet “*pterocarya*” refers to the distinctive asymmetrical capsule, which bears a broad, winged side resembling the samaras of members of *Monnina* sect. *Pterocarya* Chodat—as noted by Chodat (1914) in the protologue.

*Habitat.* This species grows on mountain slopes, in seasonally dry tropical forest (SDTF, *Selva baja caducifolia*), often in ecotonal zones with the presence of *Quercus* spp., *Pinus chiapensis* (Martínez) Andresen, and *Liquidambar styraciflua* L.

*Note.* *Polygala pterocarya* was not treated as *Senega* and included as a doubtful name by Pastore *et al.* (2023) because the type was not found, probably destroyed during World War II. However, during a review of species of Mexico it was possible to recognize this species based on the original description and the specimens identified in the herbarium MEXU. *Polygala pterocarya* belongs to *Senega* subg. *Monninopsis*, which comprises 13 species, including *Senega pterocarya*. This species is morphologically similar to *S. semialata* (S.Watson) J.F.B.Pastore & J.R.Abbott due to its strongly asymmetric capsule, which is winged and dehiscent on only one side. However, it differs in several aspects: *Senega pterocarya* has an almost straight and broader capsule (1.6-1.7 mm wide), with a wide locule bearing numerous secondary nerves (ca. 10-12) that extend from the central nerve to the capsule margin, sometimes branching dichotomously. In contrast, *S. semialata* has a narrower curved capsule (1.1-1.2 mm wide), with only 3-4 nerves concentrated in the distal half of the capsule; these are curved and directed toward the basal region, also displaying dichotomous branching. *Senega pterocarya* shares the diplochoric dispersal strategy (associated with seed heteromorphism) with *S. dolichocarpa* (S.F.Blake) J.F.B.Pastore & J.R.Abbott ([Figure 3](#)), a species

also placed in *Senega* subg. *Monninopsis* and likely closely related to *S. pterocarya*. However, the two species can be readily distinguished by the capsule's venation pattern: secondary nerves are conspicuous in *S. pterocarya* but not in *S. dolichocarpa*. They also differ markedly in the morphology of the keel, lateral petals, and seeds (see [Figure 3](#)).

*Neotype.* *Polygala pterocarya* was described by Chodat (1914) based on a specimen collected in 1898 from the cemetery of San Cristóbal Amoltepec (Oaxaca, Mexico) by Eduard Georg Seler (1849-1922) and Căcilie (Cecilia) Seler-Sachs (1855-1935). Although some Polygalaceae specimens collected by the Selers are preserved at G (*e.g.*, C. Seler & Ed. Seler 3125, 3138), the type specimen of *P. pterocarya* has not been located. It was presumably destroyed during World War II, and no original material appears to have survived. Therefore, we designate as neotype a modern specimen that perfectly matches Chodat's original description and was collected from the same region, approximately 25 km in a straight line from San Cristóbal Amoltepec, in Oaxaca.

*Diplochory* in *Senega pterocarya* and *S. dolichocarpa*. Chodat (1914) was the first to observe seed variation in *Senega pterocarya*, describing it either as lacking an aril (“*exarillata*”) or possessing two linear, membranaceous arils (“*2 appendicibus 2 linearibus membranaceis*”). However, he did not report the functional asymmetry we document here: the presence or absence of aril correlates with whether the locule is dehiscent or not. We propose that *S. pterocarya* represents a novel case of functional asymmetry within bilocular fruits in *Senega*, in which each fruit develops two distinct locules, each with a different seed dispersal strategy. One locule is indehiscent, lacks an elaiosome, and retains its seed until the entire winged capsule is dispersed by wind, facilitating anemochory. The opposite locule is dehiscent, exhibits a well-developed wing and a conspicuous elaiosome, and releases its seed upon opening, which is then dispersed by ants (myrmecochory). It is also plausible that the absence of one seed facilitates wind dispersal by reducing the capsule's weight and allowing the opened locule to function as an extended wing ([Figure 3](#)). This configuration constitutes a rare case of single-fruit diplochory, where each locule is specialized for a distinct dispersal vector. To our knowledge, such intrafruit functional differentiation has not been previously described in Polygalaceae and may represent an innovative bet-hedging dispersal strategy, enhancing recruitment success across spatial and ecological gradients. Pastore *et al.* (2019) associated the slight asymmetry in *Senega* capsules with an evolutionary transition from a samara-like ancestor. This hypothesis is supported by the presence of small, winged, bilocular samaras in *Monrosia* Grondona, the sister group to the clade that includes *Polygala* L., *Senega*, and related genera. This dispersal syndrome occurs in *S. dolichocarpa* ([Figure 4](#)) and may also occur in *S. semialata* which, as noted by Watson (1881), bears strongly asymmetric capsules with one locule dehiscent and winged, and the other indehiscent.

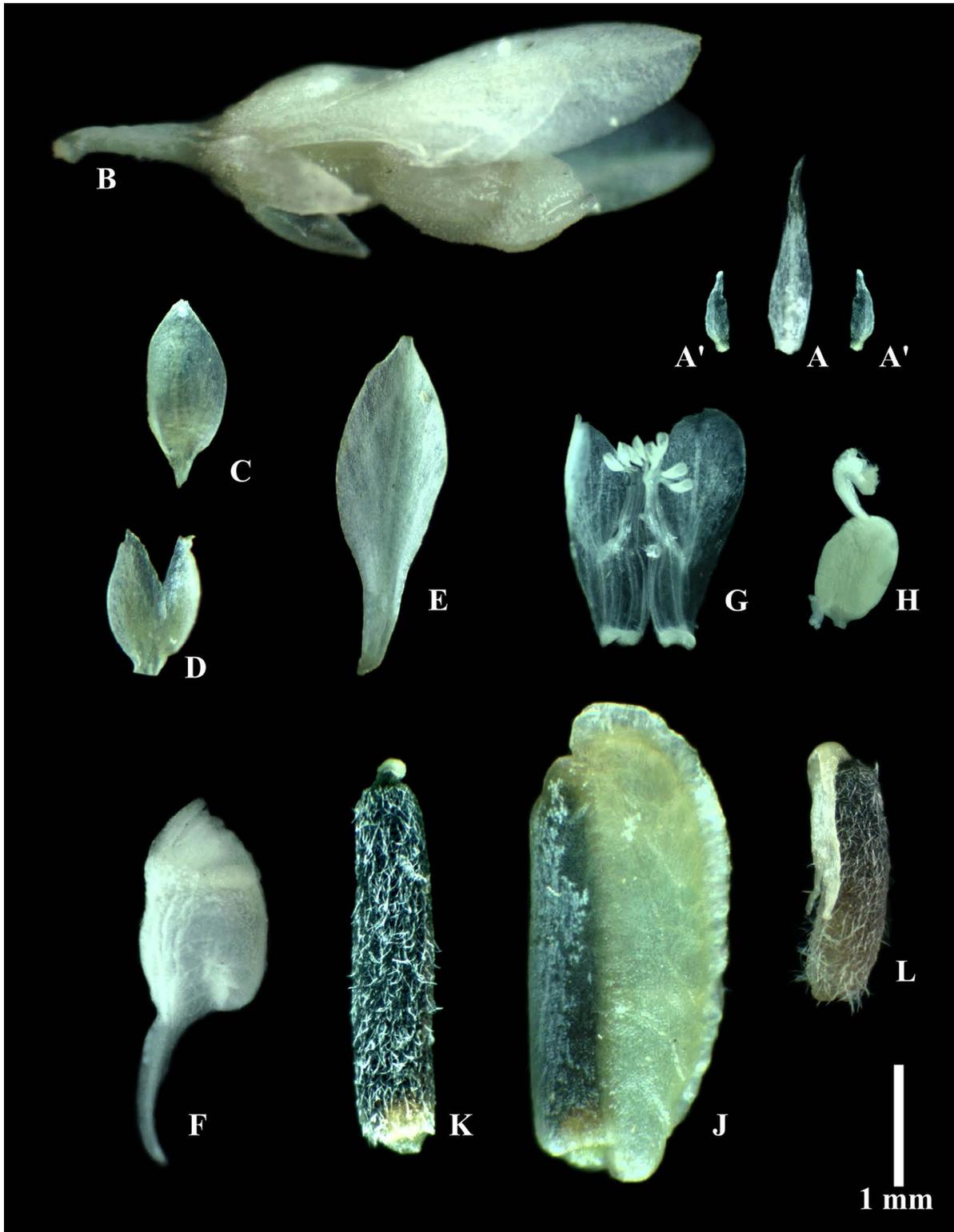
*Senega turgida* (Rose) J.F.B.Pastore & R.M.Fonseca, comb. nov.

*Type.* Mexico, San Luis de Potosí, Hacienda de Angostura, 14/07/1891, C. G. Pringle 3792 (holotype; US [bc] US00109052! ; isotypes; BKL [bc] BKL00004525!, BR [bc] BR0000008633439!, BR [bc] BR0000008634061!, BR [bc] BR008640642!, E [bc] E00327076!, G!, GH [bc] GH00025960!, JE [bc] JE00004687!, KFTA [bc] KFTA0001296!, M [bc] M0153117!, MEXU [bc] MEXU00016904!, MEXU [bc] MEXU00016905!, MICH [bc] MICH1115614!, MO [bc] MO-188637!, NDG [bc] NDG29115!, NY [bc] NY00406828!, NY [bc] NY00406829!, S-G-4992!, US [bc] US00108895!, VT [bc] UVMVT026620!).

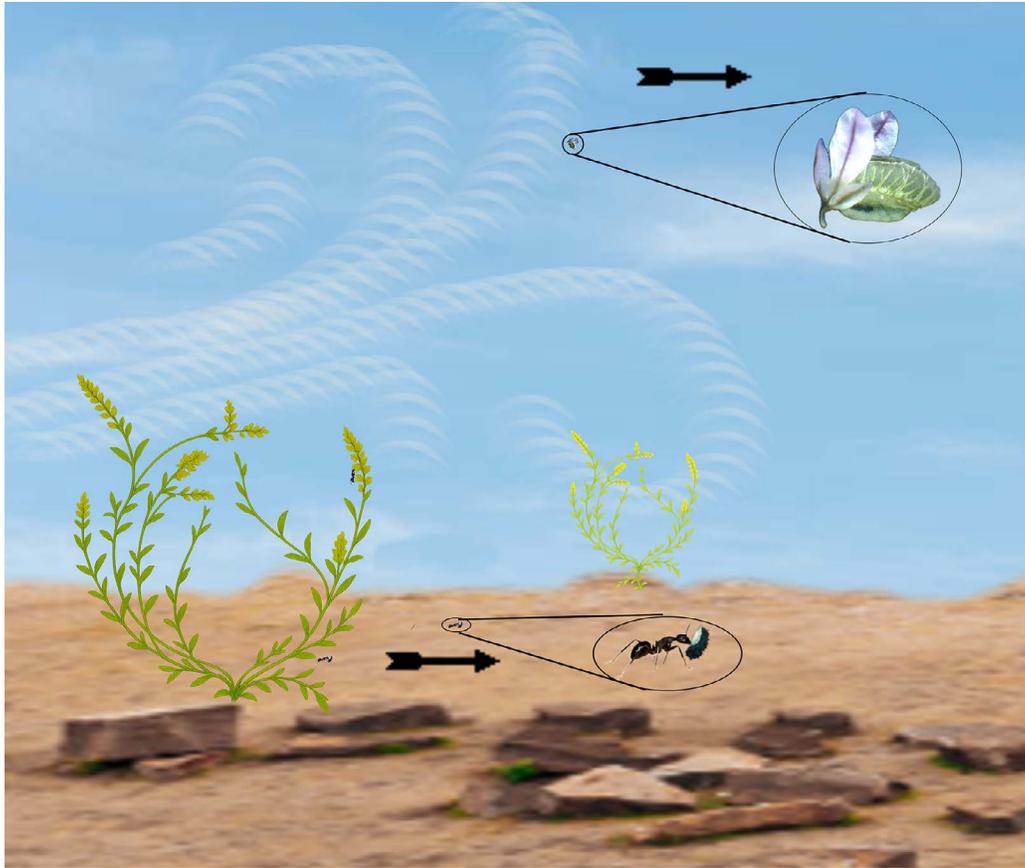
≡ *Polygala turgida* Rose, Contr. U.S. Natl. Herb. 10: 123, pl. 39. 1906.

= *Polygala alba* var. *alcalina* Chodat, Bull. Herb. Boissier 3(3): 122. 1895.

*Description.* Annual or biennial herbs, decumbent to ascending, 10-25 cm tall; roots slender to slightly thick; stems numerous, arising from the base (caespitose), or 2-3-branched when young, cylindrical, striated when dry (succulent when fresh), sparsely puberulous, stems green without yellowish glands forming spots. Leaves mostly whorled, occasionally opposite near the racemes, subsessile, succulent, lamina 0.8-1.4 × 0.2-0.6 cm, obovate, spatulate to oblanceolate, apex rounded to subtruncate, apiculate, base gradually attenuate, margin flat (not revolute), surface glabrous



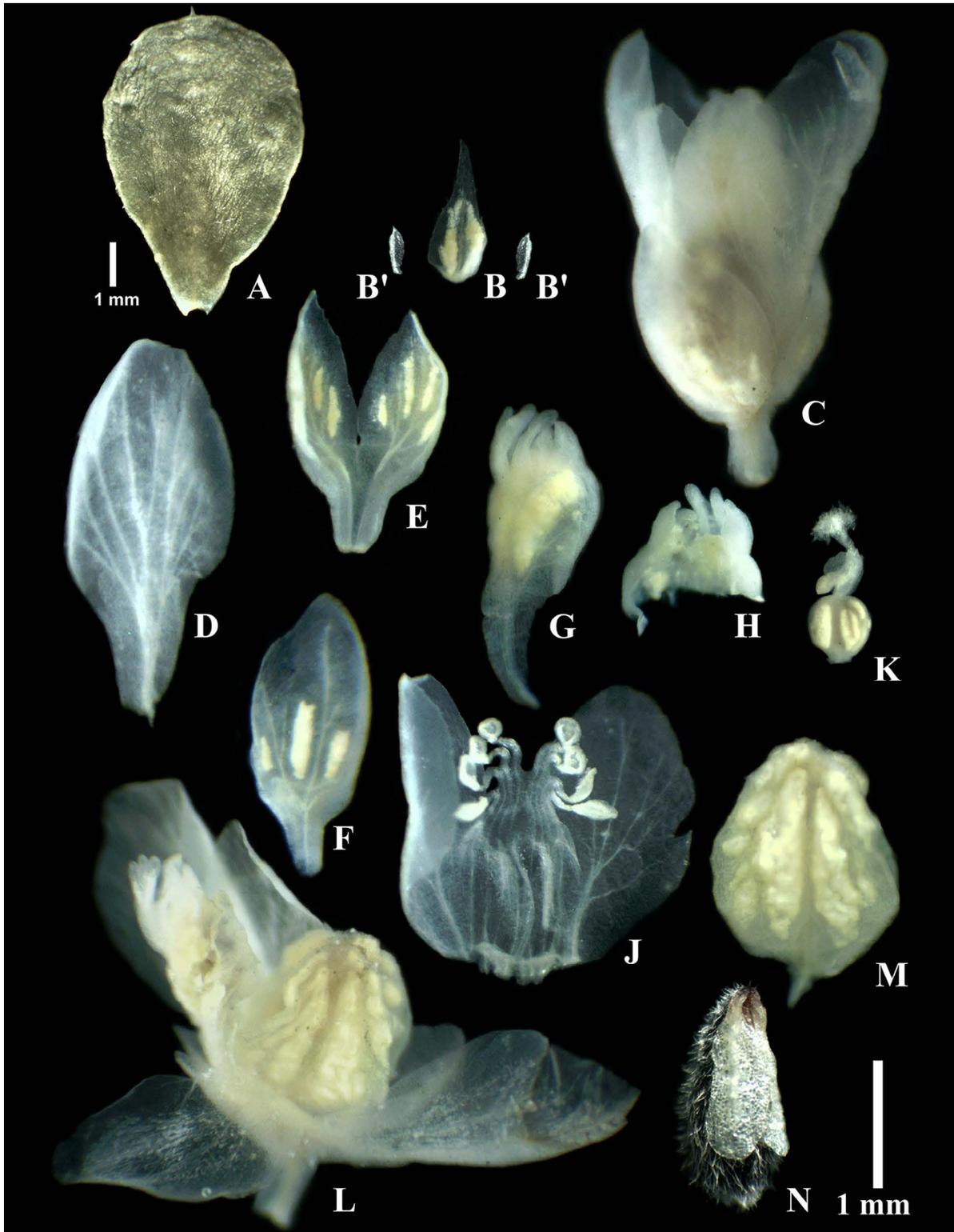
**Figure 3.** *Senega dolichocarpa* (SF Blake) JFB Pastore & JR Abbott. A bract; A' bracteoles; B flower; C lower outer sepal; D upper outer sepals; E wing (one of the inner sepals); F keel; G lateral petals, androecium; H gynoecium; J capsule (sepals removed); K seed from the non-winged locule; L seed from winged locule. From Abbott 19493 (CTBS). Photos: JFB Pastore.



**Figure 4.** Artistic representation of the diplochory hypothesis in *S. pterocarya* and *S. dolichocarpa*, with primary anemochory via asymmetrical winged capsules and secondary myrmecochory mediated by ants.

or very sparsely covered by minute simple trichomes. Racemes spiciform, 1.8-3.0 × 0.7-0.8 cm, elongating up to 6.0 cm by the time the fruits have fallen, congested; bracts ca. 1.1 × 0.4-0.5 mm, lanceolate, apex acute, sparsely ciliate at margins, with whitish spots, caducous before anthesis, ca. 3 times longer than the bracteoles; bracteoles lanceolate, not ciliate; pedicel 0.5 mm long, glabrous. Flowers (carina and corolla) pink to lavender, ca. 3.5 mm long; outer sepals not ciliate, with whitish spots at the base; lower outer sepal 1.8 × 0.9 mm, lanceolate, with rounded apex; upper outer sepals 1.2-1.3 × 0.6 mm, lanceolate, with apex acute, free from each other almost to the base; inner sepals (wings) 2.9 × 1.4 mm, ovate to broadly oblanceolate, slightly asymmetric, apex rounded, base tapering to cuneate, with one central vein and 7-8 prominent secondary veins, margins not ciliate, longer than the mature fruits. Keel ca. 2.3 mm long, apex cristate, with whitish glands forming spots on the hood and around the dorsal central vein, persistent on mature fruits; crest 0.6 mm long, 6-lobed; hood 0.7 mm long, claw 1.0 mm long, lateral petals 2.2 (ca. 1.5 free portion) × 1.2 mm, glabrous. Style 0.5 mm long, uncinuate, with a downward-curved apex; bearing a pre-stigmatic cavity located just above the stigma and ending in a conspicuous tuft of trichomes, the stigma is positioned at the tip of the hook; ovary 0.5 × 0.5 mm, ovoid, glabrous, with scattered whitish glands on the surface. Capsule 1.9-2.2 × 1.4-1.6 mm, obliquely oblong, asymmetrical, dehiscent in both locules, not winged, rugose with numerous whitish glands. Seed, all similar, ca. 1.7 × 0.8 mm, asymmetrical, ellipsoid, densely puberulous covered with short trichomes; with a membranaceous oblong elaiosome, formed by two free lobes, reaching three-quarters the length of the seed (Figure 5).

*Additional specimens examined.* Mexico. Coahuila, NE of the Sierra San Marcos, 0.8 miles E Hwy 30 on road 4.6 miles SW RR, S of Cuatro Ciénegas, 26° 56' N; 102° 05' W, 01/09/1978, *T. F. Daniel* 679 (ASU photo); Poza Bonita. Cuatro Ciénegas, 26° 54' N; 102° 1' W, 8/07/1974, *R. G. Engard & M. L. Getz* 288 (ASU photo, DES photo); 5.9 (rd)



**Figure 5.** *Senega turgida* (Rose) JFB Pastore & RM Fonseca. A leaf; B bract; B' bracteoles; C flower; D wing (one of the inner sepals); E upper outer sepals; F lower outer sepal; G keel; H crest; J lateral petals, and androecium; K gynoecium; L capsule with sepals and corolla persistent; M capsule (sepals removed); N seed. From *Flores* 198 (MEXU). Photos: J. F. B. Pastore.

miles SW of Cuatro Ciénegas Hwy 30, 26° 56' N; 102° 08' W, 24/09/1972, *J. Henrickson 7960* (ASU photo); Sierra de San Marcos, near tip and cave campsite, 26° 32' N; 101° 49' W, 04/1969, *D. J. Pinkava et al. 5820* (ASU photo, DES photo); Tip of Sierra de San Marcos, Northeast-facing, 26° 32' N; 101° 49' W, 8/06/1968, *D. J. Pinkava et al. 5086* (ASU photo); East Laguna of El Mojarral, 26° 56' 3.21" N; 102° 6' 1.56" W, 06/1968, *D. J. Pinkava et al. 5164* (ASU photo). Nuevo León, Aramberri, San Juan Puente y Avilés, 24° 10' 17.72" N; 100° 4' 6.80" W, 02/12/1984, *G. B. Hinton 18788* (MEXU). San Luis Potosí, San Bartolo, Mpio. Pastora, 25° 39' 2.07" N; 100° 14' 20.23" W, 14/05/1955, *J. Rzedowski 5822* (MEXU, US photo); Media Luna, near Río Verde, 21° 51' 43.25" N; 100° 1' 39.53" W, 2-8/06/1904, *E. Palmer 84* (US); 30 kms al NNE de Río Verde, 22° 9' 59.20" N; 99° 54' 18.45" W, 06/08/1960, *F. Takaki 304* (MEXU); About 5 km N of Matehuala just S of the junction of the Cedral highway, 23° 41' 40" N; 100° 36' 10" W, 19/05/1973, *M. C. Johnston et al. 11099* (MEXU).

**Distribution.** *Senega turgida* is known from north-central Mexico, with records from the states of Coahuila (Cuatro Ciénegas basin and Sierra de San Marcos), Nuevo León (Aramberri), and San Luis Potosí (Río Verde region (type locality) and north of Matehuala) (see [Figure 2](#)).

**Etymology.** The specific epithet '*turgida*' (from Latin *turgidus*, meaning "swollen" or "turgid") refers to the succulent, thickened leaves of the species, a notable character frequently mentioned on herbarium labels.

**Habitat.** This species grows in wet, saline environments, especially in saline basins with gypsum flats and dunes. It is associated with alkaline meadows, ciénegas (open pools and streams), flooded gypseous soils, and margins of shallow lakes.

**Notes.** The name *Polygala turgida* Rose was previously treated as a synonym of *Senega aparinoides* (Hook. & Arn.) J.F.B.Pastore & J.R.Abbott (*Senega* subg. *Senega* sect. *Verticillatae* J.F.B.Pastore & J.R.Abbott) (Pastore *et al.* 2023), based on similarities in habit and whorled leaves. However, after careful analysis, it is now recognized as a distinct species. The flowers, capsules, and seeds of *S. turgida* are smaller than those of *S. aparinoides*, with the most evident differences observed in the seeds—2.5–2.6 mm long in *S. aparinoides* vs. 1.7–1.8 mm in *S. turgida*—and in the internal sepals (wings), which are broadly elliptical and 2.3–2.4 mm wide in *S. aparinoides* vs. narrowly elliptical and 1.3–1.4 mm wide in *S. turgida*. Among the species of *Senega*, *S. turgida* has the fleshiest leaves, possibly the fleshiest in the entire genus.

Chodat (1895) was the first to describe this taxon, naming it *Polygala alba* Nutt. var. *alcalina*, based on material collected in alkaline meadows. He distinguished it from other varieties of *P. alba* by its fleshy (succulent) leaves, which he interpreted as an environmental response: "but differs (from it) by its clearly marked succulence, which is undoubtedly induced by the alkaline habitat" ["*mais en diffère par sa crassulescence si bien marquée et qui est sans doute produite par la station alcaline*"]. Later, Rose (1906) described the same collection (Pringle 3792) as *Polygala turgida*, without referencing Chodat's variety.

## Discussion

This study contributes to the ongoing taxonomic clarification of *Senega* by formally transferring three overlooked species from *Polygala* and providing updated morphological, ecological, and distributional data. The recognition of *S. arenicola*, *S. pterocarya*, and *S. turgida* within *Senega* not only clarifies the genus circumscription but also reveals remarkable evolutionary traits, such as the case of diplochory in *S. pterocarya* and the distinct morphological features separating *S. turgida* from its close relatives.

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