

A New *Senegalia*, (*S. alexae*, Fabaceae: Mimosoideae) from Panama, Brazil, and Peru.**David S. Seigler***

Department of Plant Biology, University of Illinois, Urbana, IL 61801

*Correspondent: seigler@life.illinois.edu

and

John E. Ebinger

Emeritus Professor of Botany, Eastern Illinois University, Charleston, IL 61920

ABSTRACT

Senegalia alexae Seigler & Ebinger (Fabaceae, Mimosoideae) is described. This new species is illustrated and compared to its most probable related species. Published on-line www.phytologia.org *Phytologia* 99(3):221-225 (Aug 8, 2017). ISSN 030319430.

Key Words: *Acacia* s. l., Fabaceae, Mimosoideae, *Senegalia* s. s., sp. nov.

During the past six years the authors have described ten species (Seigler et al. 2012b, 2013b, 2014; Seigler 2014; Seigler and Ebinger 2014, 2015; Ebinger 2017), and two probable hybrids (Seigler et al. 2012a, 2013a) as new to *Senegalia* Rafinesque. Also, from recent morphological and genetic studies we conclude that the genus *Senegalia* was polyphyletic as previously constituted (Seigler et al. 2017). Nine species were removed and placed in the genera *Parasenegalia* Seigler & Ebinger (seven species) and *Pseudosenegalia* Seigler & Ebinger (two species). After these changes, there are approximately 93 species, including four named hybrids, of *Senegalia* in the New World Tropics, 68 in Africa, 45 in Asia, and two in Australia (Maslin et al. 2003a, 2003b; Maslin 2015); of these, eight species occur in two or more areas.

Representatives of both the Old and New World members of *Senegalia* are trees, shrubs, or lianas, armed with prickles, and lack paired stipular spines. The prickles usually are scattered but in some species are grouped in twos or threes, usually at or near the nodes. They also occasionally occur in lines and in a few uncommon examples are fused together into lines. Prickles commonly occur on the petiole and rachis. Leaves are bipinnately compound with 1 to 50+ pairs of pinnae; the pinnae have 1 to 80+ pairs of leaflets. The usually small leaflets are mostly linear to oblong, not exceeding 10 mm in length, but a few species have leaflets that are lanceolate to oblanceolate and exceed 100 mm in length. The petiole and rachis have sessile or stipitate glands in variable positions, though sometimes the glands become specialized and are of variable shape. The structure and shape of the glands is normally consistent within a species and of diagnostic importance. The mostly 5-merous (rarely 4-merous) flowers are campanulate, actinomorphic, synsepalous, sympetalous, with numerous stamens (usually 40 to 100), the filaments are mostly not fused and are attached to a more or less tubular or campanulate nectar disc located on the receptacle of the flower surrounding the base of the mostly stipitate ovary. Inflorescences are globose heads or cylindrical spikes occurring solitary or in small clusters in the leaf axils, or grouped into complex axillary or terminal pseudo-racemes or pseudo-panicles. The legumes are oblong or broadly linear that mostly separate into two valves at maturity. A few species have tardily dehiscent or indehiscent fruits, and some fruits separate into one-seeded loments. The 6 to 20 uniseriate seeds are mostly strongly flattened and have a well-developed pleurogram.

During the course of our work on *Senegalia*, an undescribed species was noted from herbarium material from the state of Madre de Dios in central Peru. Later, we observed another specimen of this new

species from Huánuco, Peru. More recently we have seen specimens from northwestern Brazil and the Darién region of Panama. Material from Panama (*Gentry & Clewell 6928*) is of poor quality, but appears to be a member of this taxon. *Senegalia alexae* is clearly distinct and is here proposed as a new species.

Senegalia alexae Seigler & Ebinger, sp. nov. TYPE: Peru, Madre de Dios: Manú, Parque Nacional Manú, Cocha Juárez, Rio Manú, 400 m, Arbol 10 m, flores blancas, (fl), 3-5 May 1987, *P. Núñez, A. M. Lees & S. D. Wright 8004* (holotype: MO). (Figure 1).

Diagnosis. *Senegalia alexae* Seigler & Ebinger is superficially similar to *S. aristeguietana* (L. Cárdenas) Seigler & Ebinger, a species with an overlapping range (Seigler and Ebinger 2012), but may easily be distinguished by having scattered yellow, erect hairs to 0.8 mm long on the twigs, petiole, rachis, and rachilla. It also differs from *S. aristeguietana* by having shorter petioles (13-25 mm vs. 25-55 mm), fewer pinna pairs (8 to 16 vs. 15 to 30), and smaller flowers (3.5-4.5 mm vs. 4.5-6.5 mm). *Senegalia alexae* and *S. aristeguietana* are closely associated with members of the *S. amazonica* species group.

Liana or **tree** to 15 m tall; bark not seen; twigs dark purplish brown, not flexuous, terete to ridged, puberulent and with scattered yellowish hairs to 0.8 mm long; short shoots absent; prickles purplish brown throughout to slightly darker near apex, flattened, straight to mostly recurved, woody, 1-4 x 1-6 mm at the base, puberulent at least below, persistent, scattered along the twig, petiole, and rachis. **Leaves** alternate, 80-150 mm long; stipules light to dark brown, lanceolate, symmetrical, flattened, straight, herbaceous, 3.5-4.8 x 0.8-1.4 mm near the base, usually glabrous, early deciduous; petiole shallowly adaxially grooved, 13-25 mm long, puberulent and with scattered yellow hairs to 0.8 mm long; petiolar gland solitary, located mostly near the lower third of the petiole, sessile, oblong, 0.8-2.4 mm long, apex flattened to slightly bulbous when young, becoming more bulbous and wrinkled when mature, glabrous; rachis adaxially grooved, 50-130 mm long, puberulent and with scattered yellow hairs to 0.8 mm long, an orbicular gland 0.5-1.2 mm across between the uppermost 7 to 11 pinna pairs, apex depressed, glabrous; pinnae 8 to 16 pairs/leaf, 25-65 mm long, 6-11 mm between pinna pairs; paraphyllidia 0.3-0.8 mm long, commonly absent; petiolule 1-2 mm long; leaflets 39 to 59 pairs/pinna, opposite, 0.6-1.1 mm between leaflet pairs, linear, 3.5-7.1 x 0.8-1.3 mm, glabrous or nearly so on both surfaces, lateral veins usually not obvious, 1 vein from the base, base oblique, truncate on one side, margins ciliate, apex acute, midvein submarginal. **Inflorescence** a densely 23- to 38-flowered globose head 8-11 mm across, in terminal pseudo-paniculate clusters, the main axis to 35 mm long; peduncles 6-12 x 0.3-0.5 mm thick, densely puberulent; receptacle not enlarged; involucre absent; floral bracts spatulate, 0.4-0.7 mm long, puberulent, early deciduous.

Flowers sessile, white; calyx 5-lobed, 0.8-1.3 mm long, puberulent; corolla 5-lobed, 1.4-1.9 mm long, puberulent, lobes one-quarter the length of the corolla; stamens 50 to 80, stamen filaments 3.5-4.5 mm long, distinct; anther glands present; ovary pubescent, stipe to 1.1 mm long. **Legumes** straight, flattened, not constricted between the seeds, oblong, 100-150 x 18-26 mm wide, coriaceous, transversely striated, puberulent, eglandular, dehiscent along both sutures; stipe 3-6 mm long; apex obtuse, not beaked. **Seeds** not seen.

Conservation Status: This rare species is known from only six widely scattered collections (nine specimens) in northwestern South America and adjacent Panama. Because the wet tropical forest habitat for *Senegalia alexae* is rapidly disappearing, and because there are few collections of *Senegalia alexae*, this taxon should probably be listed as threatened (IUCN 2017).

Distribution and ecology: Wet tropical forests in alluvial soil and disturbed second growth forest from sea level to 500 m in northwestern Brazil (Amazonas), eastern Panama (Darién) and in central and southeastern Peru (Huánuco and Madre de Dios).

Phenology: May-June (Brazil and Peru), December (Panama).

Etymology: *Senegalia alexae* is named for Ms. Alexa Musgrove, the artist who prepared the drawings used to illustrate many of the *Senegalia* and *Vachellia* species we have studied.

Representative Specimens: PANAMA: Darién: Río Pirre near town of Pirre, 27 Dec 1972, A.Gentry & A.Clewell 6928 (F, GH, MO, NY). (vine on label). **BRAZIL:** Amazonas: Bocca do Tejo, May 1901, E. Ule 5480 (HBG). **PERU:** Huánuco: Panguana, Río Yuyapichis floodplain, 74°56'W, 9°37'S, 4 Jun 1983, F.G.Seidenschwarz 5417 (F). (tree to 12 m tall, 20 cm dbh. on label). Madre de Dios: Cocha Cashu Biological Station, Manu National Park, floodplain, 71°22'W, 11°52'S, 400 m, 14 Aug 1983, A.Gentry 43575 (MO). (canopy liana on label). Tambopata, Cuzco Amazonico, mature floodplain, 69°3'W, 12°5'S, 200 m, 20 Jun 1989, O.Phillips, P.Núñez & N.Jaramillo 520 (MO). (liana with a dbh of 12-20 mm on label).

DISCUSSION

Senegalia alexae is included in a group of species morphologically similar to *S. amazonica*. The presence of a solitary, glabrous, sessile, oblong petiolar gland mostly located on the lower third of the petiole, that usually becomes bulbous and wrinkled when mature, indicates a relationship to these species. Members of this group of species have inflorescences with globose heads or cylindrical spikes occurring in complex axillary or terminal pseudo-racemes or pseudo-panicles. The taxa of the *S. amazonica* species group with flowers in globose heads are keyed below.

Key to members of the *Senegalia amazonica* species group with flowers in globose heads.

- a. Prickles fused in continuous lines along twig ridges (se. Brazil)..... *S. serra*
- a. Prickles scattered or in lines but not fused to each other.
 - b. Petiolar gland mostly volcano-shaped, inflorescence 20-27 mm across (ne. Brazil) *S. globosa*
 - b. Petiolar glands flat to globose to bulbous, not volcano-shaped; inflorescence 9-18 mm across.
 - c. Pinnae 2 to 4 pairs/leaf; leaves less than 100 mm long (se. Brazil) *S. pteridifolia*
 - c. Pinnae 8 to 30 pairs/leaf; leaves mostly longer (Mexico to n. South America)
 - d. Petiole 13-25 mm long, puberulent and with scattered yellowish hairs to 0.8 mm long *S. alexae*
 - d. Petioles 25-125 mm long, glabrous to pubescent, lacking long, scattered yellowish hairs.
 - e. Leaflets 0.5-1.2 mm wide, 50 to 90 pairs/pinna *S. aristeguietana*
 - e. Leaflets 1.3-4.0 mm wide, 20 to 45 pairs/pinna.
 - f. Pinnae 8 to 13 pairs/leaf; inflorescence 13-18 mm across *S. membranacea*
 - f. Pinnae 11 to 24 pairs/leaf; inflorescence 9-12 mm across *S. croatii*

ACKNOWLEDGEMENTS

The authors would like to thank the curators of the numerous herbaria that have over many years sent specimens critical for our studies of *Acacia* in the broad sense. We would also like to thank colleagues for advice concerning questions of nomenclature and general taxonomy.

LITERATURE CITED

- Ebinger, J. E. 2017. A new *Senegalia* (*S. seigleri*, Fabaceae, Mimosoideae) from Bahia, Brazil. *Phytologia* 99: 126-129.
- IUCN. 2017. Guidelines for Using the IUCN Red List Categories and Criteria. Version 13. <http://www.iucnredlist.org/documents/RedListGuidlines.pdf>.
- Maslin, B. R. 2015. Synoptic overview of *Acacia* sensu lato (Leguminosae: Mimosoideae) in east and southeast Asia. *Garden Bulletin of Singapore* 67: 231-250.
- Maslin, B. R., J. T. Miller, and D. S. Seigler. 2003a. Overview of the generic status of *Acacia* (Leguminosae: Mimosoideae). *Australian Systematic Botany* 16: 1-18.
- Maslin, B. R., A. E. Orchard, and J. G. West. 2003b. Nomenclature and classification history of *Acacia* (Leguminosae: Mimosoideae), and the implications of generic subdivision. Available at: <http://www.worldwidewattle.com>.
- Seigler, D. S. 2014. A new *Senegalia* (Fabaceae, Mimosoideae) from southern Peru. *Novon* 23: 90-93.
- Seigler, D. S. and J. E. Ebinger. 2012. *Senegalia aristeguietana* (L. Cárdenas) Seigler & Ebinger (Fabaceae: Mimosoideae): an uncommon species of Central America and northern South America. *Phytologia* 94: 275-278.
- Seigler, D. S. and J. E. Ebinger. 2014. A new species of *Senegalia* (Fabaceae, Mimosoideae) from Central America and Colombia. *Novon* 23: 94-97.
- Seigler, D. S. and J. E. Ebinger. 2015. New species of *Senegalia* (Fabaceae) from South America. *Journal of the Botanical Research Institute of Texas* 9: 335-343.
- Seigler, D. S., J. E. Ebinger, and C. Glass. 2012a. *Senegalia berlandieri*, *S. greggii* and *S. wrightii* hybrids (Fabaceae: Mimosoideae) in Texas and adjacent Mexico. *Phytologia* 94: 439-455.
- Seigler, D. S., J. E. Ebinger, and C. E. Glass. 2013a. *Senegalia berlandieri*, *S. crassifolia*, and *S. reniformis* hybrids (Fabaceae: Mimosoideae) in Central and Northern Mexico. *Madroño* 60: 179-185.
- Seigler, D. S., J. E. Ebinger, and P. G. Ribeiro. 2012b. A previously unrecognized species of *Senegalia* (Fabaceae) from northeastern Brazil. *Journal of the Botanical Research Institute of Texas* 6: 397-401.
- Seigler, D. S., M. P. Morim, M. Barros and J. E. Ebinger. 2013b. A new species of *Senegalia* (Fabaceae) from Brazil. *Phytotaxa* 132: 59-63.
- Seigler, D. S., J. E. Ebinger, P. G. Ribeiro, and L. Paganucci de Queiroz. 2014. Three new species of *Senegalia* (Fabaceae) from Brazil. *Journal of the Botanical Research Institute of Texas* 8: 61-69.
- Seigler, D. S., J. E. Ebinger, C. W. Riggins, V. Terra, and J. T. Miller. 2017. *Parasenegalia* and *Pseudosenegalia* (Fabaceae): New genera of the Mimosoideae. *Novon* 25: 180-205.

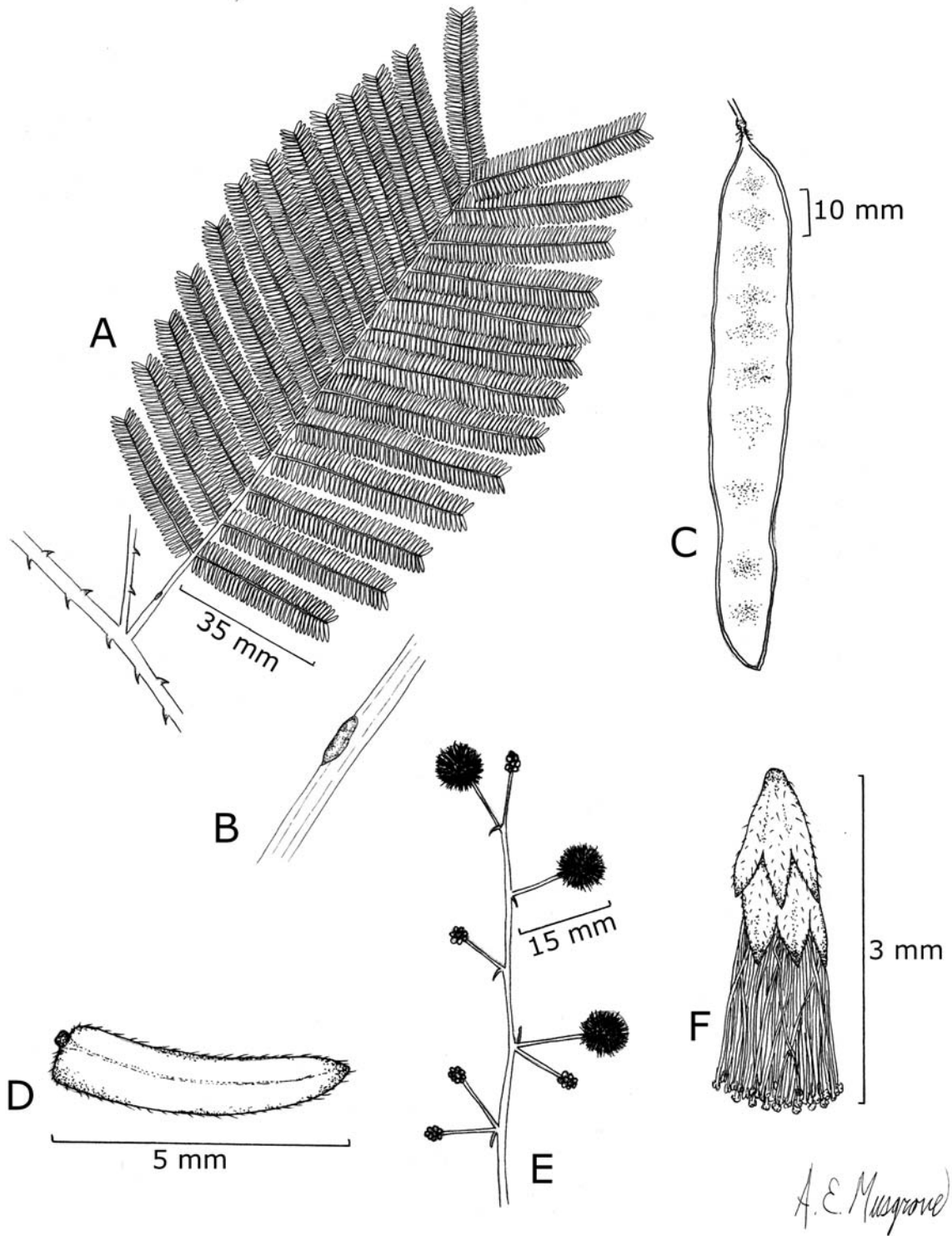


Figure 1. *Senegalia alexae* Seigler & Ebinger. A. Leaf. B. Petiolar gland. C. Fruit. D. Leaflet (abaxial view). E. Stem with pseudoinflorescences. (A, B. A. Gentry, 43575, MO; C - F. G. Seidenschwarze, 5411).