



A new combination in *Entada* (Leguminosae) from Roraima, Brazil

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Abstract

Entada simplicata, formerly recognized as a variety of *E. polystachya*, is reinterpreted as a distinct legume species, based on consistent differences regarding their leaves (number of pairs and width of leaflets), and fruits (mesocarp presence, stipe and funiculus length). Illustrations and a distribution map are provided for *E. simplicata*, which is endemic to Roraima State, northern Amazonia, Brazil.

Key words: Fabaceae, Mimosoideae, Brazilian Amazonia, taxonomy

Entada simplicata (Barneby) Sch.Rodr. & A.S.Flores, *comb. et stat. nov.* (Fig. 1, 2)

Basionym:—*Entada polystachya* (L.) DC. var. *simplicata* Barneby (1996: 175)

Type:—BRAZIL. Roraima: Caracará, Estrada Perimetral Norte, 10 km do entroncamento com estrada Manaus-Caracará próximo a Novo Paraíso, 23 August 1987, *Cid Ferreira 9220* (holotype INPA!, isotypes: NY [photo!], MG!, MIRR!).

Entada simplicata, as here defined, is sufficiently different from other New World members of *Entada* Adans. (Leguminosae: Mimosoideae) to be recognized as a distinct species. This species belongs to *E.* sect. *Entadopsis* (Britton) Brenan, because of its chartaceous and craspedial fruits and pleurogrammatic seeds up to 20 mm in diameter (Brenan 1966). The other species of this section are *E. polyphylla* Benth (1840: 133), and *E. polystachya* (L.) De Candolle (1825: 425).

Entada polyphylla and *E. polystachya* were considered as distinct species (Benth 1876, Britton & Rose 1928 [as *Entadopsis polyphylla* (Benth.) Britton (in Britton & Rose 1928: 191) and *E. polystachya* (L.) Britton (in Britton & Rose 1928: 191)], Macbride 1943, Brenan 1966) until the treatment of Barneby (1996). In his revision, Barneby (1996) treated *E. polystachya* as comprising three varieties: *E. polystachya* var. *polystachya*, *E. polystachya* var. *polyphylla* (Benth.) Barneby (1996: 175), and *E. polystachya* var. *simplicata* Barneby (1996: 175). The latter taxon was described by Barneby (1996) as new on the basis of a single flowering collection from Roraima State, northern Brazil.

Later, Barneby (2001) reconsidered *Entada polystachya* and *E. polyphylla* as separate species, as did Grimes (2002), and Forero & Romero (2009). The number of leaflets of longer pinnae is the most useful character to clearly distinguish *E. polyphylla* [(12–) 13–20 pairs] from *E. polystachya* (<11 pairs).

In the context of *Entada* taxonomy, the difference in the number of pinnae and leaflets is often employed as one of the most important features in recognizing species in Africa, Asia and South America (e.g. Brenan 1959, 1966, 1970, Barneby 2001, Tateishi *et al.* 2008, Forero & Romero 2009, Ohashi *et al.* 2010). In these papers, especially Brenan (1959, 1966, 1970), taxa which have discrete morphological differences in the

number of pinnae and leaflets, in conjunction with other foliage (e.g. pubescence), inflorescence, floral, fruit and seed characters, were afforded specific rank.

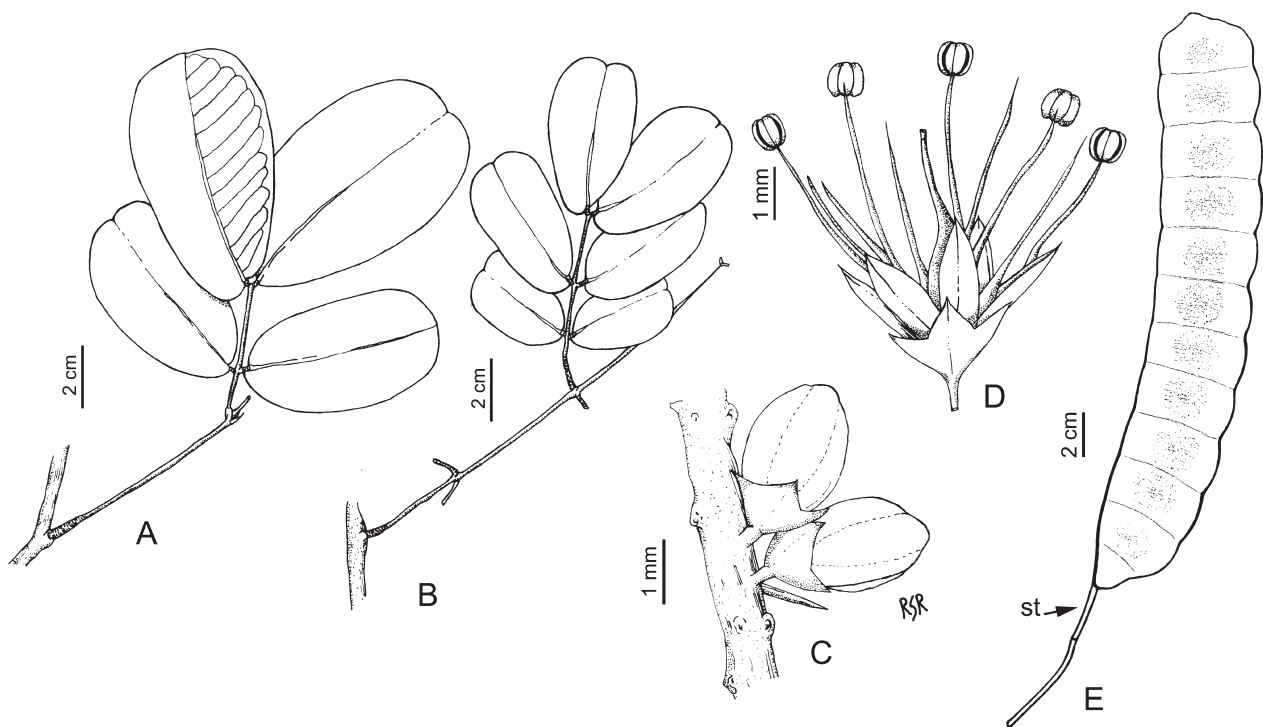


FIGURE 1. *Entada simplicata*. A. Leaf with 1 pair of pinnae (only one represented), each one with two 2 pairs of leaflets. B. Leaf with 3 pairs of pinnae (only one represented), each ones with 3 pairs of leaflets. C. Detail of a raceme, with two floral buds illustrated. D. Flower. E. Fruit (st: stipe). A from *Pessoni 639* (UFRR); B–D from *Pessoni 574* (UFRR); E from *Flores & Peixoto 2147* (MIRR). Drawn by R.S. Rodrigues.

During the course of a taxonomic study of *Entada* in Roraima State, Brazil, we made collections and observations of *Entada* in the field. In this Amazonian Brazilian State, only *E. simplicata* and *E. polystachya* have been recorded. One *E. simplicata* population and seven *E. polystachya* populations were visited in field. As a result, additional flowering specimens as well as the first fruiting specimen of *E. simplicata* became available from a new locality in Roraima. We also conducted morphology analyses based on collections at MIRR, INPA, IAN, MG, and UFRR. Additionally, digitalized images of selected specimens of *E. polystachya* from F and NY, representing specimens along its distributional range (Barneby 1996) were analyzed.

Vegetatively *Entada simplicata* is markedly distinct from the other species of *E. sect. Entadopsis*. In *E. simplicata* are only 1–3 pairs of leaflets each (18–) 22–52 mm wide, while in *E. polystachya*, there are 5–11 pairs each 5–20 mm wide, and in *E. polyphylla* there are (12–) 13–20 pairs each <8 mm wide.

Herbarium studies indicate that *Entada simplicata* also differs from *E. polystachya* in a suite of fruit characters. *Entada polystachya* has wider fruits [(5)–5.5–9.3 mm], as well as a longer funiculus (27–39 mm); in *E. simplicata* fruits are 3.8–5.3 mm wide and the funiculus is 13–17 mm long. However, *E. simplicata* has distinctly longer fruit stipes (25–36 mm long) than *E. polystachya* (8–21 mm long). A qualitative and clear-cut fruit character is the presence and composition of the mesocarp: in *E. polystachya*, the mesocarp is relatively thick over the seed chambers, and is composed of a conspicuous spongy layer; in *E. simplicata*, the mesocarp is absent, including around seed chambers. Moreover, a recent morphological study (Feitoza, Rodrigues & Flores, unpublished data) has revealed that *E. simplicata* also differs in its seed and seedling morphology, further suggesting that specific rank should be considered appropriate.

While *Entada polystachya* has the widest distribution of any Neotropical *Entada*, occurring from Western Mexico, Central America, Hispaniola, Puerto Rico, Lesser Antilles and tropical South America (Barneby 1996, 2001), *Entada simplicata* is found only in Roraima State, Brazil (Fig. 2). Field work and data from the few known specimens from Cachoeira do Roxinho region (Iracema municipality) indicate that *E. simplicata* inhabits margins of open pluvial tropical forests on rocky slopes. The type specimen, ca. 170 km SE from this region, was collected in roadside forests, on sandy or clay wet soils. On the other hand, data from field observations, herbaria and literature (Lewis & Owen 1989, Barneby 2001) indicate that in Amazonia and Venezuelan Guayana *E. polystachya* usually grows in evergreen lowland forests or trackside scrublands, frequently along flooded riverbanks. However, especially in Central America and Mexico, it may also be found in disturbed forests, in dry to wet thickets (Standley & Steyermark 1946) on rocky or sandy soils.

Additional specimens examined of *E. simplicata*:—BRAZIL. Roraima: Iracema, Cachoeira do Roxinho, 19 November 2008, *Flores & Peixoto 2147* (MIRR); Cachoeira do Roxinho, 02°18'N, 61°20'W, 14 September 2002, *Pessoni & Silva 639* (UFRR); Cachoeira do Roxinho, 21 August 2002, *Pessoni et al. 574* (UFRR).

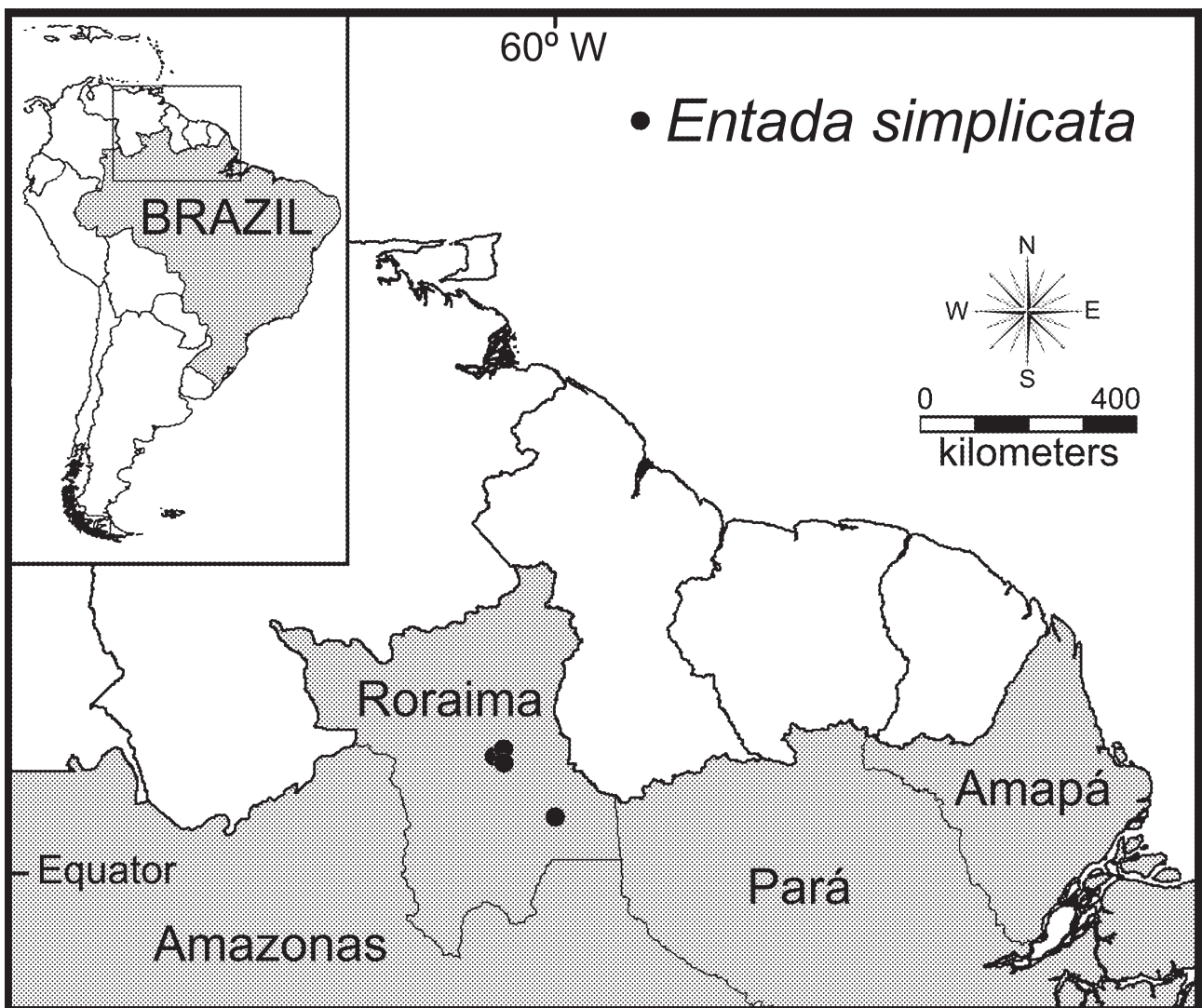


FIGURE 2. Distribution map of *Entada simplicata*.

Acknowledgments

We thank Drs. Vidal de Freitas Mansano, Silvia T.S. Miotto, and an anonymous reviewer for their comments and suggestions. We thank Dr. Mike Hopkins for improving the English. We are indebted to Drs. Enrique Forero, Carolina Romero, Yoichi Tateishi, and Tadashi Kajita for kindly locating and sending us literature. Financial support for this work came from a DCR CNPq/ Femact (proc. 0508/06-1) grant to Andréia Flores.

References

- Barneby, R.C. (1996) Neotropical Fabales at NY: asides and oversights. *Brittonia* 48: 174–187.
- Barneby, R.C. (2001) *Entada* Adans. In: Berry, P.E., Yatskievych, K. & Holst, B. K. (eds.) *Flora of the Venezuelan Guayana* 6. Missouri Botanical Garden Press, St. Louis, pp. 610–611.
- Bentham, G. (1840) Contributions towards a Flora of South America: Enumeration of plants collected by Mr. Schomburgk in British Guiana. *Journal of Botany (Hooker)* 2(11): 127–146.
- Bentham, G. (1876) *Entada* Adans. In: Martius, C.F.P. & Eichler, A.G. (eds.) *Flora Brasiliensis* 15(2). F. Fleischer, Lipsiae, pp. 268–270.
- Brenan, J.P.M. (1959) *Entada*. In: Hubbard, C.E & Milne-Redhead, E. (eds.) *Flora of Tropical East Africa*. Crown Agents, London, pp. 9–19.
- Brenan, J.P.M. (1966) Notes on Mimosoideae: XI: The Genus *Entada*, its subdivisions and a key to the African species. *Kew Bulletin* 20: 361–378.
- Brenan, J.P.M. (1970) *Entada* Adans. In: Brenan, J.P.M., Exell, A.W., Fernandes, A. & Wild, H. (eds.) *Flora Zambesiaca* 3(1). Crown Agents, London, pp. 13–23.
- Britton, N.L. & Rose, J. N. (1928) (Rosales) Mimosaceae. *North American Flora* 23: 1–194.
- De Candolle, A. (1825) Leguminosae. In: De Candolle, A. (ed.) *Prodromus, systematis naturalis regni vegetabilis* 2. Treuttel & Würtz, Paris, pp. 93–524.
- Forero, E. & Romero, C. (2009) Sinopsis de las Leguminosae: Mimosoideae de Colombia. In: Forero, E. (ed.) *Estudios en leguminosas colombianas II*. Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá, pp. 9–235.
- Grimes, J.W. (2002) Mimosaceae. In: Mori, S.A., Cremers, G., Gracie, C.A., de Granville, J.J., Heald, S.V., Hoff, M. & Mitchell, J.D. (eds.) *Guide to the Vascular Plants of Central French Guiana* 2. *Memoirs of the New York Botanical Garden* 76: 484–510.
- Lewis, G.P. & Owen, P.E. (1989) *Legumes of the Ilha de Maracá*. Royal Botanic Gardens, Kew, 95 pp.
- Macbride, J.F. (1943) Flora of Peru: Leguminosae. *Field Museum of Natural History, Botanical Series* 13: 1–507.
- Ohashi, H., Huang, T. & Ohashi, K. (2010) *Entada* (Leguminosae subfam. Mimosoideae) of Taiwan. *Taiwania* 55: 43–53.
- Standley, P.C. & Steyermark, J. A. (1946) Flora of Guatemala: *Entada* Adanson. *Fieldiana, Botany* 24: 29–31.
- Tateishi, Y., Wakita, N. & Kajita, T. (2008) Taxonomic revision of the genus *Entada* (Leguminosae) in the Ryukyu Islands, Japan. *Acta Phytotaxonomica et Geobotanica* 59: 194–210.