

**ERYTHRINA HERBACEA (FABACEAE)
AND TWO CLOSE RELATIVES FROM MEXICO**

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ABSTRACT

Erythrina herbacea L. is widespread in the southeastern USA, reaching southern Texas at its southwestern limit. An apparently related population system (previously identified as *E. herbacea*) in southeastern Nuevo León and adjacent Tamaulipas, Mexico, is described here as ***Erythrina sierra*** Nesom, **sp. nov.** — it differs from *E. herbacea* in its strigose-villous to villous-puberulent calyces and young stems, petioles and petiolules without prickles, and its short-pedicellate flowers borne singly in relatively compact clusters. The strictly Mexican *Erythrina herbacea* subsp. *nigrorosea* Krukoff & Barneby is raised in rank to ***Erythrina nigrorosea*** (Krukoff & Barneby) Nesom, **comb. et stat. nov.** These plants differ from typical *E. herbacea* in their larger and consistently shrubby to tree-like habit, flowers in compact clusters, pinkish corollas, and tendency toward dark calyces. *Erythrina nigrorosea* occurs from San Luis Potosí and southeastern Tamaulipas south to Oaxaca and Chiapas.

In previous studies of *Erythrina* (Krukoff & Barneby 1974; Krukoff 1982), *E. herbacea* L. has been considered to comprise two entities — subsp. *herbacea* of the southeastern USA and the Mexican subsp. *nigrorosea*, from Chiapas and Oaxaca north into Tamaulipas. They are treated here as distinct species with widely disjunct geographic distributions. Additionally, plants from an area of southeastern Nuevo León and adjacent Tamaulipas, Mexico, represent a previously undescribed species presumably closely related to *E. herbacea*. The three species are mapped in Figures 2 and 9.

ERYTHRINA HERBACEA L., Sp. Pl. 2: 706. 1753. *Corallodendron herbaceum* (L.) Kuntze, Revis. Gen. Pl. 1: 172. 1891. **LECTOTYPE** (Reveal in Turland & Jarvis, Taxon 46: 469. 1997): **USA. [South Carolina]**. Without other data (Catesby, Nat. Hist. Carolina 2: t. 49. 1736. Figure 2).

Erythrina herbacea forma *albiflora* Moffler & Crewz, Phytologia 52: 288. 1983. **TYPE: USA. Florida.** Pinellas Co.: Fort DeSoto Park, St. Jean Key, W of State Rd 693 in coastal thicket, (T33S, R16E, sec. 8), large shrub to 3 m, associates *Quercus geminata*, *Sabal palmetto*, *Dalbergia ecastaphyllum*, 24 Apr 1981, D.W. Crewz 2132 (holotype: STPE; isotype: USF digital image!).

Described from a single white-flowered plant in a population of red-flowered ones.

Erythrina arborea (Chapm.) Small, Fl. S.E. U.S., 647. 1903. *Erythrina herbacea* var. *arborea* Chapm., Fl. South. U.S. (ed. 3), 117. 1897. **TYPE: USA. Florida.** Protologue: "Stems woody, 10 ft–20 ft high, widely branching at the summit; racemes axillary, few-flowered; flowers smaller; legume erect. — South Florida." A specimen at MO is possible type material: the handwritten label says "S Florida. Feb 1872, Dr. Chapman [s.n.]." The collection has no leaves or flowers, just three long branches or portions of branches.

Xyphanthus hederifolius Raf., Fl. Ludov., 103. 1817. *Erythrina hederifolia* (Raf.) Spreng., Syst. Veg. 3: 244. 1826. **TYPE: USA. [Louisiana]**. Rafinesque noted in his description of the genus *Xyphanthus* that "This genus differs from *Erythrina* by the shape of the calyx, which is not bilobated; the *E. herbacea* belongs perhaps to it." The description of the species is detailed and diagnostic ("having much affinity with *Erythrina herbacea*") but refers only to "Raf.—*Erythrina* Rob. p. 503."

Erythrina rubicunda Jacq., Fragm. Bot., 75, t. 119. 1809. **TYPE:** Jacquin knew the species from gardens in Holland, where he thought the name *Erthrythina herbacea* was misapplied. "Ex Hollandia in hortos nostrates ante plures annos migravit haec planta sine indicata sub erroneo Erythrinae herbaceae titulo. Ad nullum ex cognitis reducere potui, hinc ceu novam speciem propono." No specimen was cited but the color illustration unequivocally shows *Erythrina herbacea* L.



Figure 1. Inflorescence of *Erythrina herbacea*. Bradford Co., Florida, 2 Apr 2005, *Bitter 113* (FLAS).

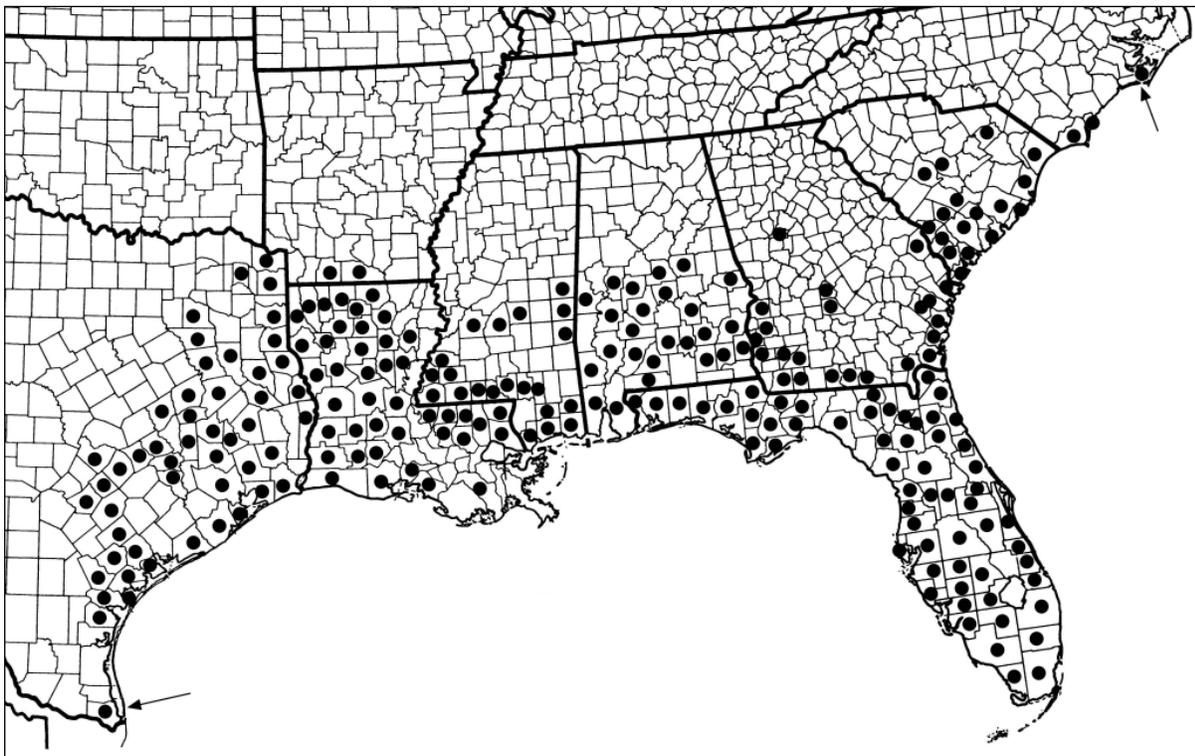


Figure 2. Distribution of *Erythrina herbacea*. Data from various literature and internet sources and collections at TEX-LL and SMU-BRIT-VDB. Arrows show northernmost locality in Carteret Co., North Carolina, and southernmost locality in Cameron Co., Texas. The species is not known to occur in Mexico.

Erythrina herbacea occurs natively in Texas as far south as Cameron Co. (Fig. 1), where known from several collections (TEX database 2016), but it has not been documented from Mexico. Diggs et al. (1999) included the species in their treatment of the north-central Texas flora based on a plant of *E. herbacea* supposedly escaped from cultivation in Tarrant Co., Texas (BRIT; along fence of residence on East Davis Street in Fort Worth), but there is no evidence of its naturalized persistence there. An occurrence in Payne Co., Oklahoma, mapped by Kartesz (2014) is based on a specimen from cultivation (Amy Buthod, pers. comm. 2016).

Catesby's description and illustration (Fig. 2) of the root of *Erythrina herbacea* are not only the first but perhaps still the best available: "The Root of this Plant resembles that of Briony, being large at Top, running down into the Earth four or five Feet, white within, and covered with a brown Rind; some of them so large, that they weigh upwards of twenty Pounds." The swelling taproot of a young plant is shown in Figure 3. In mature plants with numerous stems from the base (Fig. 4), new shoots apparently are produced from buds of the broad caudex region at the taproot apex.



Figure 3. Mark Catesby's 1736 illustration of *Erythrina herbacea* L., which serves as the lectotype of the species.



Figure 4. Potentially massive taproot of a young plant of *Erythrina herbacea* from Florida. Photo from Mark Hutchinson (2011), with permission.



Figure 5. *Erythrina herbacea* from Hernando Co., Florida. Multicapital apex of tuberous taproot. Photo by Mark Hutchinson.



Figure 6. *Erythrina herbacea* from Hernando Co., Florida. Multiple shoots (axillary?) arising from near apex of branch previously cut off near the ground. Photo by Mark Hutchinson.

Over most of the range of *Erythrina herbacea*, the plants commonly are herbaceous perennials with flowers and leaves on separate stems (flowers borne on leafless stems) arising separately from the broad caudex/ root apex. Flowers and leaves often, however, are borne on the same stem — the flowers usually in a dense to loose raceme above the leaves but sometimes axillary in the proximal portion of the inflorescence. In southern Florida and occasionally elsewhere, axillary buds (presumably) of stem bases persisting from the previous year may produce new shoots and the plants are shrubby (e.g., see Fig. 6).



Figure 7. Growth habit of *Erythrina herbacea*, showing numerous stems arising from broad caudex/root apex. Texas, locality otherwise unspecified. Photo by Sally and Andy Wasowski, from Lady Bird Johnson Wildflower Center's collection of plant images, NPIN Image Id: 22416.

ERYTHRINA SIERRA Nesom, **sp. nov.** **TYPE: MEXICO.** Tamaulipas. Mpio. Hidalgo: Into the sierra, 14.9 mi W of Hotel Santa Engracia, 4.3 mi W of the Adelaida-Guayabas jct, 24° 01' N, 99° 34' W, side of steep canyon, NW-facing slope, primarily oaks (*Q. rysophylla* dominant) with *Ungnadia* and large Lauraceae, 560-570 m, 17 Apr 1988, *G.L. Nesom 6349* with L. Hernandez, M. Martinez, and J. Jimenez (TEX). Figure 5.

Similar to *Erythrina herbacea* in its low habit and narrow, red corollas, different in its larger stem prickles, petiole and petiolules without prickles, strigose-villous to villous-puberulent calyces and young stems, and its short-pedicellate flowers borne in a relatively compact distal cluster, the inflorescence not elongating and separating into distinct whorls.



Figure 8. Holotype of *Erythrina sierra*.

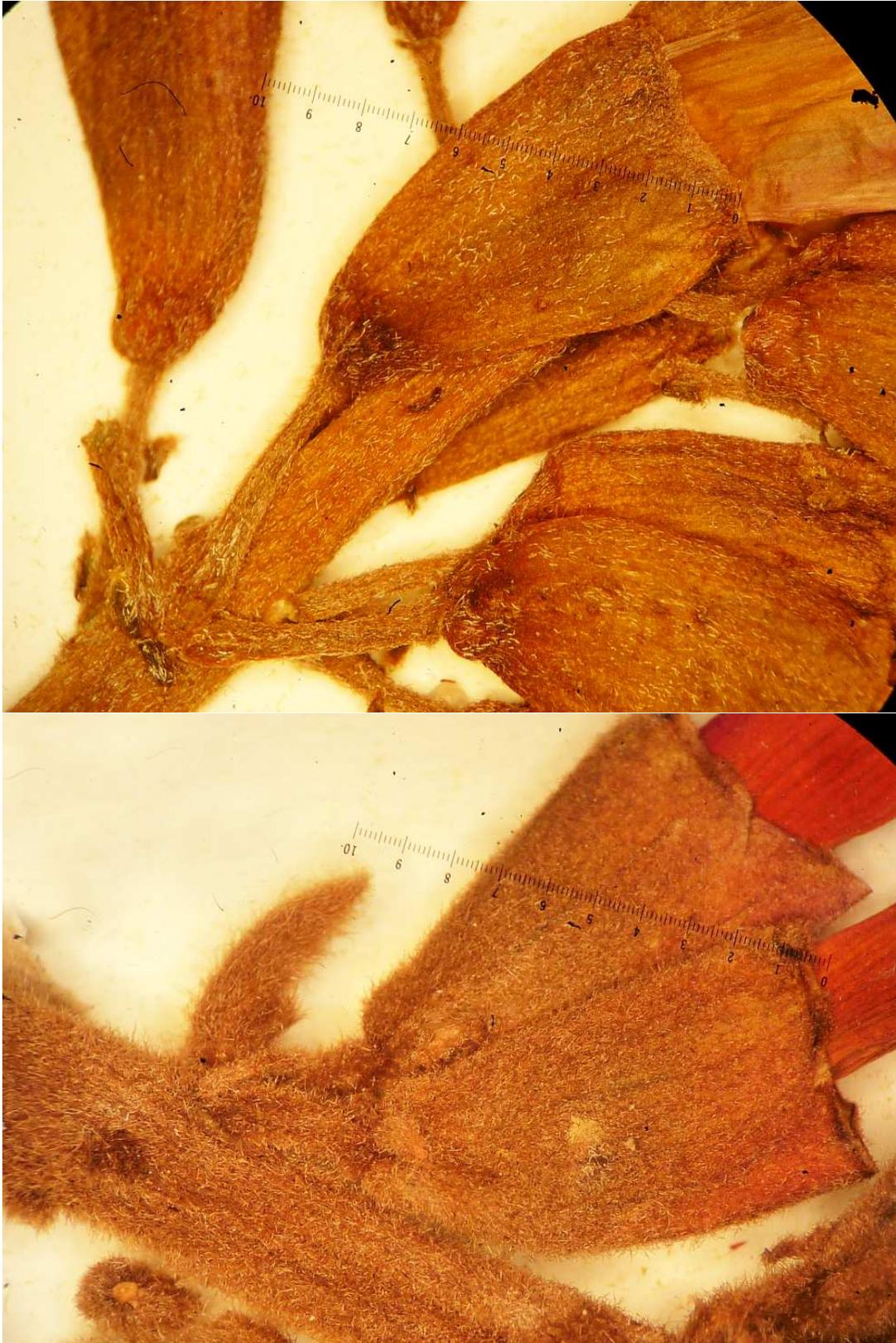


Figure 9. Calyces of *Erythrina sierra* showing variation in vestiture.

Shrubs 0.5–2 m tall; producing abundant, slightly recurving prickles 4–9 mm long, young stems and inflorescence axis moderately to densely strigose-villous to villosulous-puberulent with dark hairs, glabrescent. **Leaves** arising from clustered nodes at stem tips, 3-foliolate, glabrous, rachis and petiolules apparently without prickles; leaflets ovate to triangular, deltate, or depressed-ovate, barely if at all 3-lobed, 33–45 mm long, 24–50 mm wide at base, base mostly truncate to broadly obtuse, apex obtuse to acute but not acuminate, sometimes retuse. **Flowers** mostly borne singly, sometimes in fascicles of 2–3, not in obvious whorls, inflorescence axis at maturity 5–13 cm; pedicels 2–3(–5) mm. **Calyx** moderately to densely strigose-villous to villosulous-puberulent, tube 8–11 mm, apex truncate. **Corolla** banner pseudotubular, enclosing keel and wings, (2.5–)3–5(–6) cm, red to scarlet. **Fruits** subcylindric with shallow constrictions, 6–10 cm. **Seeds** 4–8, 10–13 mm long, orange-red.

Additional collections examined. MEXICO. Nuevo León. Mpio. Zaragoza: from Hwy jct "Y" ["La Ygriega" S of Galeana] toward Los Tepozanes, shale ravine, 1570 m, 26 Mar 1993, *Hinton & et al.* 22758 (HINT digital image, TEX); Dulces Nombres, N.L., and just E of border into Tamaulipas, E side Cerro Linadero, steep, shaded, grassy, S-facing slopes in canyon, 1900 m, 9 Aug 1948, *Meyer & Rogers* 2895 (MO). **Tamaulipas. Mpio. Hidalgo:** Purificación, on cliffs in oak woods, 1530 m, 28 Apr 1995, *Hinton et al.* 25266 (HINT digital image, MO); Mimbres toward [->] Dulces Nombres, mixed forest, 1935 m, 5 Jun 1994, *Hinton et al.* 24307 (HINT digital image, MO). [Mpio. San Carlos]: ca. 10 mi NW of San Carlos, 15 Mar 1976, *Whalen* 287 (TEX).

The morphological distinction of *Erythrina sierra* is shown in the following couplet.

1. Stems and inflorescence axis glabrous or minutely puberulent and glabrescent; stem prickles 2–5(–7) mm long; rachis and petiolule sometimes with scattered minute prickles; leaflet blades ovate-acuminate to hastate-ovate, trilobed to subtrilobed, apices acuminate; flowers borne singly or usually in fascicles of 2–4 per node, inflorescence axis elongating to 8–40 cm, with flowers in distinct whorls; pedicels 3–9 mm; calyx tube glabrous to sparsely strigillose ***Erythrina herbacea***

1. Young stems and inflorescence axis moderately to densely strigose-villous to villosulous-puberulent; stem prickles 4–9 mm long; rachis and petiolule without prickles; leaflet blades ovate to triangular, deltate, or depressed-ovate, barely if at all 3-lobed, apices not acuminate; flowers mostly borne singly, sometimes in fascicles of 2–3, inflorescence axis elongating to 5–13 cm, with flowers not separating into distinct whorls; pedicels 2–3(–5) mm; calyx tube strigose-villous to villosulous-puberulent ***Erythrina sierra***

ERYTHRINA NIGROROSEA (Krukoff & Barneby) Nesom, **comb. et stat. nov.** *Erythrina herbacea* subsp. *nigrorosea* Krukoff & Barneby, *Phytologia* 25: 6. 1972. **TYPE: MEXICO. Oaxaca.** **Protologue:** "Gulf slope of Isthmus of Tehuantepec." **Label:** Near Matias Romero, soon after a divide (Atlantic drainage), pink standards, small shrub with spines, 6 Mar 1970, *B.A. Krukoff* 1970-83 (holotype: NY digital image!; isotype: F digital image!).

Shrubs or small trees 1.5–3 m, densely armed with stout, recurved prickles 3–6 mm long, stems and inflorescence axes glabrous to sparsely strigose. **Leaves:** petioles and petiolules often with prickles; petiolules 3–6 mm; leaflets ovate to triangular-ovate, deltate-ovate, or rhombic with broadly to narrowly acuminate apex, sometimes 3-lobed. **Flowers** borne singly or in fascicles of 2–3, inflorescence elongating to 5–12(–15) cm but mostly remaining relatively compact (proximal flowers deciduous, see Figs. 8 and 9), not separating into conspicuous whorls; pedicels 1–4(–5) mm. **Calyx** pinkish to dark red, reddish brown, or blackish, glabrous to sparsely strigose or strigillose with fine, minute hairs, tube 7–10 mm. **Corolla banner** 3–5 cm, pink to pinkish-red. **Fruits** subcylindric with shallow constrictions, 6–12 cm. **Seeds** 2–8, 10–12 mm long, orange-red to reddish brown.

These plants were identified as *Erythrina herbacea* (Krukoff 1939) and then *E. standleyana* (Krukoff 1971). Krukoff and Barneby (1972) recognized them to be distinct as *E. herbacea* subsp. *nigrorosea*, as they were still later also identified by Krukoff (1982). *Erythrina nigrorosea* differs from typical *E. herbacea* in its larger habit, pink flowers, more congested inflorescence, and its southern geography. *Erythrina standleyana* occurs in Belize, Guatemala, Campeche, Quintana Roo, Tabasco, and Yucatan — the plants are shrubs or trees (1–)3–5(–6) meters tall with unlobed, ovate to broadly ovate or ovate-acuminate leaves and a prominently elongating inflorescence.

The epithet 'nigrorosea' alluded to the calyx/corolla color contrast (the plants are "especially attractive because of [their] pale pink standard contrasting with a black calyx" (Krukoff & Barneby 1972, p. 7). The corolla color is relatively constant but a survey of herbarium collections indicates that the calyx color is more variable. David Neill made collections of *Erythrina nigrorosea* in the vicinity of Lerdo de Tejada, Veracruz, in January 1983, documenting variation in calyx and corolla color (Neill 5389, 5390, 5392, 5393; LL, MO). His labels described the plants as multiple-stemmed shrubs 2–3 meters tall. Calyces varied from yellowish red to brownish red or red; banner and keels varied from pink to red or pink with a red apex. He noted the possibility of hybrid influence in 5389 and 5390 with *E. folkersii* Krukoff & Moldenke, which grew within 1 kilometer of the *E. nigrorosea* populations. Neill also made collections at the type locality (Oaxaca: 5 km N of Matias Romero, 14 Apr 1983, Neill 5640, LL, MO) — calyces there were reddish brown; corollas were pink — and in Chiapas (Mpio. Catazaja, Neill 5536, 5537, 5538, MO), where calyces were noted to be reddish brown to green and corollas pink to pale red and red.



Figure 10. *Erythrina nigrorosea*. Note the pink calyces (see comments in text regarding color variability). Photo by Randy Baldwin at a location near Aquismón, San Luis Potosí. Used by permission of San Marcos Growers.



Figure 11. *Erythrina nigrorosea* cultivated by Jeff Chemnick in Santa Barbara, California. Grown from seeds collected by Chemnick with Randy Baldwin at Aquismón, San Luis Potosí, same population as shown in Fig. 10. Photo by Randy Baldwin, 29 March 2016.

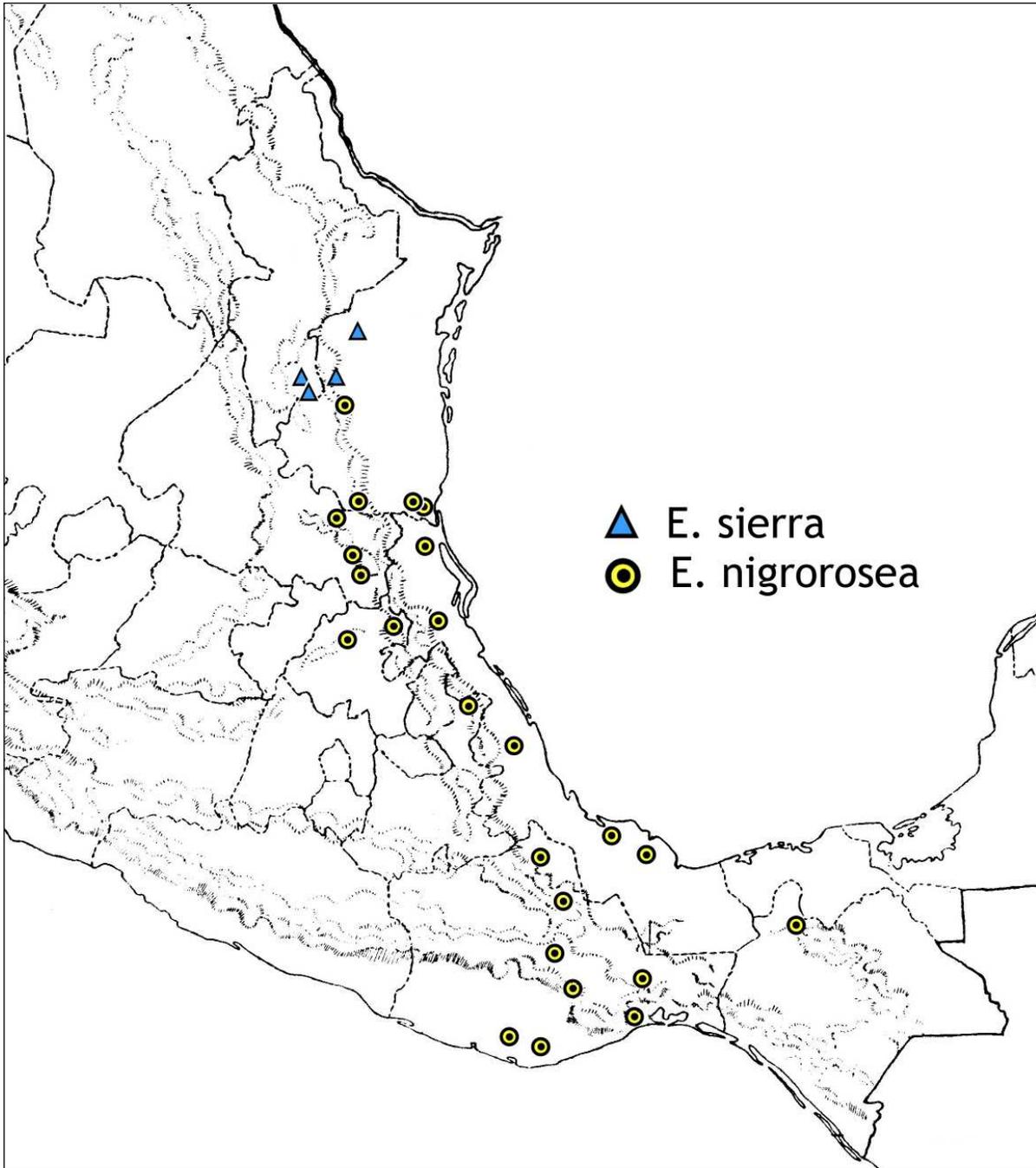


Figure 12. Distribution of *Erythrina sierra* and *E. nigrorosea*. Specimen citations for *E. sierra* are given in the text; localities for *E. nigrorosea* are from Kruhoff (1971) and Kruhoff and Barneby (1972) and from collections at MO, TEX-LL, and SMU-BRIT-VDB.

The ranges of *Erythrina nigrorosea* and *E. sierra* apparently closely approach each other in central Tamaulipas, but they are different in habitat. Collections examined of *E. nigrorosea* are these: Mpio. Victoria: ca. 6 mi S of Cd. Victoria along Rte. 70, open sun, 6 Apr 1961, *King 4509* (TEX!); vic. of Victoria, 320 m, 1 May-13 Jun 1907, *Palmer 544* (MO!). Kruhoff (1971) cited (as *E. standleyana*) other collections from the vicinity of Cd. Victoria: *Runyon 972* (US); *Palmer 119* (US), and *Kenoyer & Crum 3315* (GH); these are presumed here to be *Erythrina nigrorosea*.



Figure 13. *Erythrina nigrorosea*. Photo by Randy Baldwin at a location near Aquismón, San Luis Potosí. Used by permission of San Marcos Growers.



Figure 14. *Erythrina nigrorosea* cultivated by Jeff Chemnick in Santa Barbara, California. Grown from seeds from Aquismón, San Luis Potosi, same population as in Fig. 11. Photo by Randy Baldwin, 29 March 2016.



Figure 15. *Erythrina nigrorosea*. Photo by Sally and Andy Wasowski, April 1986, cultivated in Texas (location otherwise unspecified). From the image collection of Lady Bird Johnson Wildflower Center's collection of plant images, NPIN Image Id: 22417, identified as *E. herbacea*.

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