



Flora of North America

Buddleja (Scrophulariaceae)

Eliane Meyer Norman

09 March 2012

Notice About Flora of North America Provisional Publications

Preparation of each volume of the Flora of North America is a multi-year process involving dozens of authors and editors. To facilitate access to taxonomic treatments that meet specific editorial criteria but that otherwise might not appear in printed volumes for months or possibly years, the Flora of North America Association (FNAA) electronically publishes treatments. These “Provisional Publications” have been peer-reviewed and are formatted for eventual publication in print copy by Oxford University Press. Provisional Publications are versions of treatments that minimally meet the following editorial standards:

Any 03 level manuscript that has been

- 1) accepted and approved by the taxon editor as an official FNA submission;
- 2) initially tech-edited (i.e., has been formatted and edited by the volume technical editor);
- 3) through regional review, with regional review comments and any additional tech-editing comments addressed by the author and corrections made to the manuscript; and
- 4) reviewed once by the bibliographic editor;
- 5) approved by the author(s) and taxon editor for posting as a Provisional Publication.

Major corrections, additions, and other modifications are allowed to 03 version manuscripts, and significant changes are published as new versions become available. Provisional Publications at the 04 level (second bibliographic pass completed, reviews by nomenclature and reviewing editors completed, genus description checked for parallelism against other genera in the family) and 05 level (all major checks completed, treatment ready for indexing and application of styles) are closer to publication form.

Readers are encouraged to submit comments and corrections for Provisional Publications to the author(s) and taxon editor, especially comments concerning the geographic distributions of taxa. Contact information can be found at <http://floranorthamerica.org/review> under the appropriate volume. The header portion of each Provisional Publication contains the taxon name and manuscript version, book volume number, taxon editor surname, manuscript page number, and date when then the posted version was published provisionally.

All provisional publications are copyrighted by the Flora North America Association and are to be cited as follows:

Author, Date, Title (e.g. Genus name, Flora of North America, Provisional Publication), Publishing institution, Date of publication, URL, Date actually viewed.

Example: Whittemore, A. T. and E. McClintock. 2008. Pittosporaceae. Flora of North America, Provisional Publication. Flora of North America Association. September 14, 2007. fna.huh.harvard.edu/files/Pittosporaceae.pdf. Accessed [date actually viewed].

Questions about FNA Provisional Publications may be directed to Ms. Heidi Schmidt, Managing Editor, Flora of North America Association, at heidi.schmidt@mobot.org.

X. BUDDLEJA Linnaeus, Sp. Pl. 1: 112. 1753; Gen. Pl. ed. 5, 51. 1754 * Butterfly bush
[For Adam Buddle, 1660--1715, English botanist, vicar of Farmbridge]

Eliane Meyer Norman

Chilianthus Burchell; *Nicodemia* Tenore

Shrubs or trees; stolons absent. **Stems** erect or pendent, (young branches terete or quadrangular), young stems usually with tomentum of stellate and glandular hairs. **Leaves** persistent, semipersistent, or deciduous, cauline, opposite, decussate, subcoriaceous or not; stipular lines present or absent; petiole present or absent; blade margins crenate, dentate, undulate, serrate, sinuate-dentate, subentire, entire, or involute. **Inflorescences** terminal, rarely axillary, cymes in heads, pseudovercils, or panicles (usually with tomentum of stellate and glandular hairs); (peduncles present or absent); bracts present. **Pedicels** often absent; bracteoles present or absent. **Flowers** bisexual, sometimes functionally dioecious, or rarely trioecious; sepals 4, calyx radially symmetric, campanulate, lobes acute or obtuse; petals 4, corolla yellow, yellowish orange, greenish yellow, purple, pink, or white, sometimes with yellow-orange eye or white throat, radially symmetric, campanulate-rotate, salverform, funnellform, or tubular, (papillate trichomes internally); stamens 4, adnate to corolla tube, usually included, rarely exerted, (usually sessile or sessile), equal, filaments glabrous, staminode 0; ovary 2- or 4-locular, placentation axile; (style threadlike); stigma capitate, clavate, or clavate and slightly 2-lobed. **Berries or capsules**, symmetric, ovoid or globose to cylindrical, oblong, ellipsoid, or subglobose, dehiscence septical and loculicidal or, rarely, indehiscent. **Seeds** 20--100+, yellow to brown, tetrahedral, fusiform, or threadlike (*B. davidii*), usually dorsiventrally compressed, winged or not winged (testa reticulate). $x = 19$.

Species ca. 100 (10 in the flora): North America, Mexico, Central America, South America, Asia, e Africa, Indian Ocean Islands (Madagascar); introduced in Europe, Africa, Pacific Islands (New Zealand), Australia.

Buddleja species, especially Asiatic ones, have been cultivated widely for many years for their attractive flowers and leaves and their pleasant floral scent. Some plants readily persist and spread after cultivation; one of these, *B. davidii*, is considered an invasive weedy plant of concern in many parts of the world (N. G. Tallent-Halsell and M. S. Watt 2009). Many species are used as remedies in folk medicine (E. M. Norman 2000). Almost all members of this genus thrive in sunny disturbed habitats.

The *Buddleja* species of Madagascar and nearby islands have berries rather than capsules and have been segregated by some authors into the genus *Nicodemia*; other African taxa that have flowers with open corollas with well-exserted stamens rather than tubular flowers with included, sessile or sessile stamens have been referred to *Chilianthus*. I have been conservative in my approach here and have treated them both as *Buddleja*. A recently initiated molecular study of *Buddleja* and related genera may shed light on these problems (R. Olmstead and N. O'Leary, pers. comm.). Further study is needed in clarifying these problems.

SELECTED REFERENCE Norman, E. M. 2000. Buddlejaceae. In: Organization for Flora Neotropica. 1968+. Flora Neotropica. 98+ nos. New York. No. 81, pp. 1--225.

1. Inflorescences broadly paniculate; corollas white; stamens conspicuously exerted beyond corolla tube.....7. *Buddleja saligna*
1. Inflorescences narrowly paniculate, spicate, racemose, or capitate; corollas yellow, yellowish orange, greenish yellow, orange, purple, violet, or pink, rarely white, sometimes with yellow-orange eye or white throat; stamens included in corolla tube.
 2. Corollas tubular or salverform, tube 7--14 mm.
 3. Leaf blades orbicular to elliptic; corollas greenish yellow 2. *Buddleja indica*
 3. Leaf blades ovate, ovate-lanceolate, or elliptic; corollas yellowish orange, purple, violet, pink, or white, sometimes with yellow-orange eye or white throat.
 4. Corollas yellowish orange; stamens inserted proximal to throat of tube4. *Buddleja madagascariensis*
 4. Corollas purple, violet, pink, or white, sometimes with yellow-orange eye or white throat; stamens inserted medially or 3--5 distal to base of tube.
 5. Cymes almost encircling inflorescence axis; corollas straight..... 1. *Buddleja davidii*
 5. Cymes secund; corollas curved 3. *Buddleja lindleyana*
 2. Corollas funnellform, salverform, or campanulate rotate, tube 1.5--5 mm.
 6. Leaf blades glabrous or glabrescent adaxially.
 7. Shrubs, 0.3--1.5 m; cymes 6--12-flowered; corolla lobes orbicular..... 6. *Buddleja racemosa*
 7. Shrubs or trees, 1.5--4 m; cymes 10--35-flowered; corolla lobes ovate..... 9. *Buddleja sessiliflora*
 6. Leaf blades glandular-tomentose on both surfaces (appearing grayish).
 8. Inflorescences capitate; corollas deep yellow (turning orange) 5. *Buddleja marrubiifolia*
 8. Inflorescences pseudoverticillate spikes; corollas light yellow, lemon yellow, or greenish yellow.
 9. Corolla tubes 1.5--2 mm, lobes oblong..... 8. *Buddleja scordioides*
 9. Corolla tubes 4--5 mm, lobes orbicular 10. *Buddleja utahensis*

1. ***Buddleja davidii*** Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 10: 103. 1888 * Summer-lilac I W

Shrubs, 0.5--3 m. **Stems** branched, tomentose; young branches subquadrangular. **Leaves** often with auriculate stipules; petiole 5 mm; blade ovate to ovate-lanceolate, 10--15 x 2--4 cm, base attenuate or cuneate, margins serrate or subentire, apex acute or acuminate, tomentose abaxially, glabrous or glabrescent adaxially. **Inflorescences** terminal, tapered-spicate or narrowly paniculate thyrses, 10--20 x 2--4 cm, cymes (almost encircling inflorescence axis), 10--25 pairs, 3--30-flowered, subtended by small leaves proximally, linear bracts distally; peduncle 0.5--1 cm proximally, reduced distally. **Pedicels** essentially absent; bracteoles present. **Flowers** fragrant; calyx sparsely pubescent externally, tube 1.5--2 mm, lobes 0.5--1.5 mm, apex acute or acuminate; corolla (straight), violet, pink, more rarely white, often with yellow-orange eye, salverform, puberulent or glabrous externally, pilose distal to insertion of stamens internally, tube 8--10 mm, lobes suborbicular, 2--3 x 2--3 mm; stamens inserted medially in tube, included in corolla tube; filaments essentially absent; anthers 1 mm; ovary ovoid, 2 mm, glabrous or minutely pubescent; style 1--2 mm; stigma clavate, 1 mm. **Capsules** brown, narrowly ellipsoid, 5--9 x 1.5--2 mm, glabrous or puberulent, dehiscence primarily septical. **Seeds** threadlike, 3--4 x 0.5 mm, long-winged, body not filling testa. $2n = 76$.

Flowering May--Oct; fruiting Jul--Nov. Roadsides, railroad embankments, quarries, streambeds, landslide scars, sandy lakeshores and disturbed sites; 0--1300 m; introduced; B.C., Ont.; Ala., Calif., Conn., Del., D.C., Ga., Ill., Ky., Md., Mass., Mich., Mo., N.J., N.Y., N.C., Ohio, Oreg., Pa., R.I., S.C., Tenn., Va., Wash., W.Va.; Asia (China); introduced also in Central America, South America, Europe, Africa, Pacific Islands (Hawaii, New Caledonia, New Zealand), Australia.

Buddleja davidii has been designated as a noxious weed in Oregon and Washington; it is a serious invader also in England, New Zealand, and Australia. The species can often form dense thickets and produce abundant seeds (N. G. Tallent-Halsell and M. S. Watt 2009).

SELECTED REFERENCE Tallent-Halsell, N. G. and M. S. Watt. 2009. The invasive *Buddleja davidii* (butterfly bush). Bot. Rev. (Lancaster) 75: 292--325.

2. ***Buddleja indica*** Lamarck in J. Lamarck et al., Encycl. 1: 513. 1785 (as Budleia) * Oak-leaved butterfly bush, parlor-oak I

Nicodemia diversifolia (Vahl) Tenore

Shrubs, 0.5--2 m. **Stems** branched, brown tomentose when young, glabrescent; young branches subterete. **Leaves** without stipular lines; petiole 3--10 mm; blade orbicular to elliptic, 3--6 x 2--5 cm, base cuneate, margins crenate to undulate, apex rounded, glabrous except for hairs on veins abaxially, glabrous adaxially. **Inflorescences** axillary or rarely terminal, (reduced), paniculate, 2--3.5 x 1--2 cm, cymes 1--3, 5--7-flowered, subtended by small bracts; peduncle 0.5--1 cm. **Pedicels** essentially absent; bracteoles present. **Flowers** not fragrant; calyx tomentose externally, tube 1.5--2.5 mm, lobes 1--2 mm, apex subulate; corolla greenish yellow, salverform, pubescent externally, pilose distal to level of ovary internally, tube 7--8 mm, lobes broadly ovate, 2--2.5 x 1.2--1.5 mm; stamens inserted near orifice of tube, included in corolla tube; filaments absent; anthers 1 mm; ovary ovoid or ellipsoid, 1--1.5 mm, tomentose; style 4--5 mm (pubescent at base); stigma capitate, 0.5 mm. **Berries** white, ovoid, 12--15 x 5--7 mm, glandular-pubescent. **Seeds** ovoid, 2--2.5 x 1.5--2 mm, not winged, body filling testa. $2n = 76$.

Flowering and fruiting year-round. Scrub, roadsides; 0--10 m; introduced; Fla.; Indian Ocean Islands (Comoro Islands, Madagascar, Mascarene Islands).

Buddleja indica is a recent introduction to Florida. First collected there in 1998, it is now found in Broward, Martin, and Palm Beach counties. *Buddleja indica* is often cultivated, especially in greenhouses in temperate regions.

3. **Buddleja lindleyana** Fortune, Edwards's Bot. Reg. 30(misc.): 25. 1844 (as Buddlea) * Lindley's butterfly bush I

Shrubs, 1--3 m. **Stems** branched, tomentulose; young branches subquadrangular. **Leaves** without stipular lines; petiole 1--5 mm; blade elliptic to ovate, 2--10 x 1--4 cm, base acute, margins entire or sinuate-dentate, apex acuminate, appressed pubescent abaxially, glabrescent adaxially. **Inflorescences** terminal, (pendent), tapering-spicate thyrses, 4--20 x 2--4 cm, cymes (secund), 10--20 pairs, 1--5-flowered, subtended by small leaves proximally, progressively smaller bracts distally; peduncle absent. **Pedicels** essentially absent; bracteoles absent or present. **Flowers** fragrant; calyx densely pubescent externally, tube 1.5--3 mm, lobes 0.5--1 mm, apex acute; corolla (curved), purple with white throat, tubular, pubescent to farinose externally, pilose from proximal to anthers to orifice of tube internally, tube 11--14 mm, lobes suborbicular, 2--3 x 2--3 mm; stamens inserted 3--5 mm distal to base of tube, included in corolla tube; filaments essentially absent; anthers 1--2 mm; ovary ovoid, 1.5--2.5 mm, glabrescent; style 1 mm; stigma clavate, 1--1.5 mm. **Capsules** brown, ellipsoid, 4--6 x 2--2.5 mm, glabrous or sparsely glandular, dehiscence primarily septical. **Seeds** tetrahedral, 0.7--1 x 0.5--0.7 mm, narrow wings at edges, body almost filling testa. $2n = 38$.

Flowering Jun--Oct; fruiting Aug--Nov. Roadsides, railroad embankments; 10--200 m; introduced; Ala., Ariz., Fla., Ga., La., Miss., N.C., S.C., Tex.; Asia (China, Japan); introduced also in West Indies (Guadeloupe, Jamaica, Martinique).

4. **Buddleja madagascariensis** Lamarck in J. Lamarck et al., Encycl. 1: 513. 1785 (as Budleia) * Smoke bush I

Nicodemia madagascariensis (Lamarck) R. Parker

Shrubs, (climbing, sarmentose) 2--5 m. **Stems** branched, tomentose; young branches terete. **Leaves** often with orbicular stipular lines; petiole 5--15 mm; blade ovate to elliptic, 8--15 x 2--5 cm, base rounded, margins entire, apex acuminate, tomentose abaxially, glabrous or glabrescent adaxially. **Inflorescences** terminal, tapering-spicate thyrses, 5--25 x 3--5 cm, cymes 10--25 pairs, 5--15-flowered, subtended by small leaves proximally, linear bracts distally; peduncle 0.5 cm proximally, reduced distally. **Pedicels** essentially absent; bracteoles present. **Flowers** slightly fragrant; calyx tomentose externally, tube 2--3 mm, lobes 0.5--1 mm, apex acute or obtuse; corolla yellowish orange, salverform, tomentose externally, glabrous internally, tube 7--9 mm, lobes suborbicular, 2.5--3.5 x 2--3 mm; stamens inserted proximal to throat of tube, included in corolla tube; filaments essentially absent; anthers 1--1.5 mm; ovary subglobose, 1--1.5 mm, tomentose at tip; style 4--5 mm; stigma clavate, 1--1.5 mm. **Berries** bluish purple at maturity, otherwise white, globose, 2.5--5 x 2.5--5 mm, glabrous. **Seeds** ovoid, 0.6--0.9 x 0.5--0.6 mm, not winged, body filling testa. $2n = 38$.

Flowering Mar--May; not known fruiting in continental United States. Roadsides; 10--20 m; introduced; Fla.; Indian Ocean Islands (Madagascar); introduced also in Mexico, West Indies (Cuba, Puerto Rico), South America (Argentina, Uruguay), Europe (Greece), Africa (Republic of South Africa), Indian Ocean Islands (Mauritius, Réunion), Pacific Islands (Fiji, Hawaii, New Caledonia, New Zealand), Australia.

Buddleja madagascariensis is considered a serious invader in Hawaii at 900--1200 m, where it sets abundant fruits; this contrasts with the report by A. J. M. Leeuwenberg (1979) that he had observed specimens with fruits only from Crete, Madagascar, and Mauritius.

5. *Buddleja marrubiifolia* Bentham in A. P. de Candolle and A. L. P. de Candolle, Prodr. 10: 441. 1846 *
Woolly butterfly bush

Shrubs, 0.5--2 m. **Stems** much-branched, tomentose; young branches terete. **Leaves** with faint stipular lines; petiole 3--5 mm; blade ovate to rhomboid, 1--6 x 1--2.5 cm, base cuneate, acute, or attenuate, margins crenate, apex obtuse or rounded, densely tomentose on both surfaces (appearing grayish). **Inflorescences** terminal, capitate, 1--1.5 x 0.8--1.2 cm, cymes 1, 5--25-flowered, subtended by pair of small bracts; peduncle 0.5--1 cm. **Pedicels** essentially absent; bracteoles absent. **Flowers** fragrant; calyx tomentulose externally, tube 2--3.5 mm, lobes 1--1.5 mm, apex obtuse; corolla deep yellow (turning orange), salverform, tomentulose on distal 1/3 of tube externally, pilose proximal to insertion of stamens, glandular distal to stamens internally, tube 3--4.5 mm, lobes orbicular, 1--1.5 x 1.5--2 mm; stamens inserted in distal 1/3 of tube, included in corolla tube; filaments essentially absent; anthers 0.6--1 mm; ovary ovoid, 1--1.5 mm, distal 1/2 glandular-tomentose; style 1--2 mm; stigma clavate, slightly 2-lobed at apex, 0.6--1 mm. **Capsules** brown, oblong-ovoid, 3--4 x 1.5--2 mm, glandular-tomentulose at apex, dehiscence septical and loculicidal. **Seeds** ellipsoid, 1--1.3 x 0.2--0.3 mm, short-winged at chalazal end, body essentially filling testa. **2n** = 38.

Flowering Feb--Aug; fruiting Jul--Oct. Limestone cliffs and canyons; 600--1300 m; Tex.; Mexico (Chihuahua, Durango, Hidalgo, Nuevo León, San Luis Potosí, Tamaulipas, Zacatecas).

Buddleja marrubiifolia is an attractive shrub that is found with *Agave lecheguilla*, *Dasyllirion leiophyllum* Engelman ex Trelease, and *Fouquieria splendens* Engelman. In Mexico, it is found growing at elevations to 2300 m. Although cultivated in Arizona and Hawaii, it does not appear to have escaped in either state.

6. *Buddleja racemosa* Torrey in W. H. Emory, Rep. U.S. Mex. Bound. 2(1): 121. 1859 (as *Buddleia*) * Wand
butterfly bush E

Shrubs, (lax, often pendent), 0.3--1.5 m. **Stems** much-branched, glandular-tomentose when young; young branches terete. **Leaves** with faint stipular lines; petiole 5--20 mm; blade ovate-oblong or lanceolate, 3--10 x 1.5--4 cm, base hastate, cuneate, or truncate, margins irregularly dentate, crenate, or subentire, apex acute, appressed tomentose or with a few stellate hairs abaxially, always with conspicuous glandular trichomes abaxially, glabrous or glabrescent adaxially. **Inflorescences** terminal, racemose, 3--10 x 1.5--4 cm, cymes (globose), 4--28 pairs, 6--12-flowered, (0.5--0.7 cm wide), subtended by short linear bracts; peduncle absent or to 1.5 cm proximally, reduced distally. **Pedicels** absent; bracteoles absent. **Flowers** slightly fragrant; calyx tomentose and glandular externally, tube 1--1.7 mm, lobes 0.5--0.8 mm, apex acute; corolla pale yellow, funnelform, salverform, or campanulate-rotate, tomentose in distal 1/2 of tube, glandular at base of lobes externally, pilose in distal 2/3 of tube internally, tube 1.5--2.4 mm, lobes orbicular, 0.7--1 x 1--1.5 mm; stamens inserted in distal 1/3 of tube, included in corolla tube; filaments essentially absent; anthers 0.4--0.8 mm; ovary ovoid, 0.7--1.2 mm, glandular-tomentose; style 0.5--1 mm; stigma clavate, slightly 2-lobed at apex, 0.5--0.7 mm. **Capsules** brown, ovoid, 2--2.5 x 1.7--2 mm, glandular-tomentose, dehiscence septical and loculicidal. **Seeds** ellipsoid, 0.5--0.6 x 0.2--0.3 mm, not winged, body filling testa.

Varieties 2 (2 in the flora): Texas.

- | | |
|---|---|
| 1. Leaves sparsely stellate-pubescent abaxially..... | 6a. <i>Buddleja racemosa</i> var. <i>racemosa</i> |
| 1. Leaves appressed stellate-tomentose abaxially..... | 6b. <i>Buddleja racemosa</i> var. <i>incana</i> |

6a. *Buddleja racemosa* Torrey var. *racemosa* E

Leaves sparsely stellate-pubescent abaxially. **2n** = 38.

Flowering May--Aug; fruiting Jul--Oct. Limestone cliffs, along rivers, creeks, and springs; 200--800 m; Tex.

Variety *racemosa* is found on the eastern end of Edwards Plateau.

6b. *Buddleja racemosa* Torrey var. *incana* Torrey in W. H. Emory, Rep. U.S. Mex. Bound. 2(1): 121. 1859 (as *Buddleia*) E

Leaves appressed stellate-tomentose abaxially.

Flowering May--Aug; fruiting Jul--Oct. Limestone cliffs, along rivers, creeks, and springs; 200--800 m; Tex.

Variety *incana* is found on the southwestern part of Edwards Plateau.

7. *Buddleja saligna* Willdenow, Enum. Pl. 1: 159. 1809 * Squarestem butterfly bush I

Shrubs or trees, 0.5--5 m. **Stems** much-branched, lepidote when young; young branches quadrangular. **Leaves** with faint stipular lines; petiole 2--10 mm; blade narrowly elliptic to linear, 6--15 x 0.4--3 cm, base cuneate or decurrent, margins entire, apex acute to acuminate, appressed tomentose abaxially, glabrescent adaxially. **Inflorescences** axillary or terminal, broadly paniculate, 8--14 x 10--16 cm, cymes (compound), 5--7 pairs, 15--60-flowered, (cymules 3--5-flowered), subtended by small leaves proximally, bracts distally; peduncle 1--4 cm proximally, reduced distally. **Pedicels** 1--2 mm; bracteoles present or absent. **Flowers** fragrant; calyx lepidote externally, tube 0.5--1 mm, lobes 0.2--0.3 mm, apex acute; corolla white, campanulate-rotate, glabrous or lepidote externally, pilose ring proximal to sinus internally, tube 1--1.2 mm, lobes suborbicular, 1--1.5 x 0.7--1 mm; stamens inserted medially in tube, conspicuously exerted beyond corolla tube; filaments 1.5--2.5 mm; anthers 0.5 mm; ovary ovoid, 0.5--0.8 mm, sparsely lepidote; style 0.5 mm; stigma capitate, 0.2 mm. **Capsules** brown, oblong, 1.5--2.5 x 0.8--1 mm, sparsely lepidote, dehiscence primarily septical. **Seeds** ovoid, 1--1.4 x 0.4--0.6 mm, short wings at both end, body almost filling testa.

Flowering May--Sep; fruiting Jul--Oct. Roadsides, disturbed chaparral, banks above canyon floors; 400--1200 m; introduced; Calif.; Africa (Republic of South Africa).

Buddleja saligna is established in the Santa Monica Mountains of Los Angeles County, where it was first collected in 1965 (*Fuller 13379*, *CDA*), and the nearby San Gabriel Mountains.

8. *Buddleja scordioides* Kunth in A. von Humboldt et al., Nov. Gen. Sp. 2(fol.): 278; 2(qto.): 345; plate 183.

1818 * Escobilla butterfly bush

Shrubs, 0.3--1.2 m. **Stems** much-branched, tomentose and glandular; young branches quadrangular. **Leaves** with faint stipular lines; petiole absent; blade oblong to linear, 1--3 x 0.3--0.8 cm, base cuneate or attenuate, margins coarsely crenate, apex obtuse, glandular-tomentose on both surfaces (appearing grayish). **Inflorescences** terminal, pseudoverticillate spikes, 2--10 x 0.4--0.7 cm, cymes 3--15 pairs, 6--15-flowered, subtended by progressively smaller leaves distally; peduncle absent. **Pedicels** absent; bracteoles absent. **Flowers** fragrant; calyx thickly tomentose externally, tube 1.5--1.8 mm, lobes 0.2--0.5 mm, apex obtuse; corolla lemon yellow or greenish yellow, funnellform, glandular-tomentose on distal 1/2 externally, glabrous internally, tube 1.5--2 mm, lobes oblong, 1--1.5 x 0.5--0.9 mm; stamens inserted at orifice of tube, included in corolla tube; filaments essentially absent; anthers 0.4--0.8 mm; ovary globose, 0.5--1 mm, glandular-tomentose; style 1--1.5 mm; stigma clavate, slightly 2-lobed at apex, 0.3--0.5 mm. **Capsules** grayish green, subglobose, 1.5--2.5 x 1.5 mm, densely glandular-tomentulose at apex, indehiscent. **Seeds** ovoid, 0.7--0.8 x 0.5--0.6 mm, not winged, body filling testa. $2n = 38$.

Flowering May--Aug; fruiting Sep--Nov. Roadsides, rangeland, thorn scrub; 600--1400 m; Ariz., N.Mex., Tex.; Mexico.

Buddleja scordioides is a weedy species growing on limestone or gypsum soils in the Trans-Pecos region of Texas with *Acacia greggii*, *Flourensia cernua*, and *Larrea tridentata*, and in semixeric areas in central Arizona and southeastern New Mexico. The species occurs also in Mexico, throughout the Chihuahuan Desert and as far south as the state of Mexico, at elevations to 2500 m.

9. *Buddleja sessiliflora* Kunth in A. von Humboldt et al., Nov. Gen. Sp. 2(fol.): 278; 2(qto.): 345; plate 182.

1818 * Rio Grande butterfly bush

Buddleja pringlei A. Gray

Shrubs or trees, 1.5--4 m. **Stems** much-branched, tomentose when young; young branches subquadrangular. **Leaves**: basal ones: stipular lines evident; petiole 10--40 mm; blade ovate, 9--23 x 5--14 cm, base attenuate to obtuse, decurrent, margins serrate or 2x-serrate, apex acute or acuminate, tomentulose abaxially, glabrescent adaxially; basal ones: stipular lines evident; petiole 0--10 mm; blade lanceolate or narrowly elliptic, 5--15 x 1.5--3 cm, base attenuate, decurrent, margins entire or irregularly serrate, apex acute, tomentulose abaxially, glabrescent adaxially. **Inflorescences** terminal, pseudoverticillate spikes, 6--25 x 1--3 cm, cymes 5--20 pairs, 10--35-flowered, subtended by progressively smaller leaves distally; peduncle absent or to 1 cm proximally, reduced distally. **Pedicels** absent; bracteoles absent. **Flowers** malodorous; calyx tomentose externally, tube 1.7--3 mm, lobes 1--1.8 mm, apex acute; corolla yellow, funnellform, tomentose externally, abundantly pilose in distal 1/2 of tube and base of lobes internally, tube 3.2--4.2 mm, lobes ovate, 1--1.5 x 1.2--1.7 mm; stamens inserted 1 mm proximal to orifice of tube, included in corolla tube; filaments 0.3--0.5 mm; anthers 0.8--1.2 mm; ovary ovoid, 1--1.5 mm, distal 1/2 tomentose; style 1--1.5 mm; stigma clavate, 1.2--1.4 mm. **Capsules** brown, cylindrical, 4--4.5 x 1.7--2 mm,

tomentose at apex, dehiscence septicial and loculicidal (at apex). Seeds fusiform, 0.8--1.2 x 0.3--0.4 mm, winged, body not filling testa. $2n = 76$.

Flowering Jan--Apr; fruiting Mar--Jun. Tamaulipan thorn scrub, riparian woodlands, roadsides; 10--1400 m; Ariz., Tex.; Mexico.

Buddleja sessiliflora is found in association with *Dodonaea viscosa*, *Fouquieria splendens*, and *Parkinsonia aculeata* in Arizona and with *Celtis laevigata*, *Fraxinus berlandieriana*, and *Prosopis glandulosa* in Texas. The species is widespread in Mexico from Sonora and Tamaulipas to the Isthmus de Tehuantepec, except in the Chihuahuan Desert, at elevations to 2800 m.

10. **Buddleja utahensis** Coville, Proc. Biol. Soc. Wash. 7: 69. 1892 (as *Buddleia*) * Panamint or Utah butterfly bush E

Buddleja marrubifolia Bentham var. *utahensis* (Coville) M. E. Jones

Shrubs, 0.3--1 m. **Stems** much-branched, gray-tomentose; young branches subterete. **Leaves** with faint stipular lines; petiole absent; blade linear to oblong, 1.5--3.5 x 0.3--0.5 cm, base attenuate, margins involute, crenate to undulate, apex rounded, densely glandular-tomentose on both surfaces (appearing grayish). **Inflorescences** terminal, pseudoverticillate spikes, 4--12 x 0.8--1.3 cm, cymes 3--7 pairs, 5--15-flowered, subtended by progressively smaller leaves distally; peduncle absent. **Pedicels** absent; bracteoles present or absent. **Flowers** slightly fragrant; calyx glandular-tomentose externally, tube 2.5--3.5 mm, lobes 1--2 mm, apex acute; corolla light yellow, salverform, pilose primarily proximal to stamens, glandular-tomentose in distal 2/3 externally, glandular trichomes in rows distal to stamens internally, tube 4--5 mm, lobes orbicular, 1--1.2 x 1.5--1.7 mm; stamens inserted 1.5--1.7 mm proximal to orifice of tube, included in corolla tube; filaments essentially absent; anthers 0.6--1 mm; ovary ovoid, 1--1.5 mm, distal 1/2 tomentulose; style 1--1.5 mm; stigma clavate, slightly 2-lobed at apex, 0.5--1 mm. **Capsules** brown, ovoid, 2--2.5 x 1.3--1.5 mm, tomentulose near apex, dehiscence septicial and loculicidal. **Seeds** ellipsoid, 0.4--0.5 x 0.2--0.3 mm, not winged, body filling testa.

Flowering Apr--Aug; fruiting Jun--Sep. Limestone outcrops in pinyon-juniper and Joshua tree woodlands; 700--2000 m; Ariz., Calif., Nev., Utah.