

SOLANACEAE POTATO FAMILY

Part One.

Datura L.

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Herbs, vines, shrubs, or small trees, with stellate or branched hairs, often armed with prickles, often producing alkaloids, producing no latex. LEAVES alternate, simple or compound, exstipulate. FLOWERS usually perfect, solitary or borne in cymose inflorescences; corolla sympetalous, rotate to tubular, usually 5-lobed, usually actinomorphic; stamens epipetalous, alternating with corolla lobes; anthers opening by longitudinal slits or terminal pores, distinct or united; gynoecium usually 2-carpelate, the carpels united in a usually bilocular, superior ovary. FRUIT a berry or capsule; seeds usually numerous. —Ca. 85 genera, ca. 2800 species, nearly worldwide, best developed in tropical America; ca. 11 genera in AZ.

The following genus, *Datura*, is distinguished from other Solanaceae in AZ by its solitary flowers with large white to purplish-tinged corollas and spiny capsules.

Datura L. Jimsonweed, Thornapple, Toloache

Foetid, annual or perennial herbs, to 1.5 m tall, dichotomously branched, with a short tap root or elongated tuberous roots; stems, leaves and fruit glabrate to pubescent with unbranched, multicellular glandular to nonglandular trichomes. LEAVES simple, alternate, spreading, ovate to elliptical, petiolate, exstipulate; apex acute; margins variously pinnately lobed or dentate; base unequal, cuneate to truncate. FLOWERS solitary, erect, perfect, actinomorphic, fragrant, nocturnal, lasting 1 day, pedicellate, terminating their respective axes but appearing in middle of bifurcated stems; calyx synsepalous, green, tubular, circumscissile near base leaving persistent flange on fruit, the apex with 5 valvate, acuminate teeth; corolla sympetalous with defined tube, throat and limb, funnelform, white, sometimes with purplish tinge, the corolla limb with 5 acumens (each terminating 3 veins) and 5 interacuminal sinuses or lobes; stamens 5, free, equal, usually included, epipetalous; filaments adnate to corolla at or near middle, the adnate filament bases forming 5 nectar guides or channels to basal nectaries; anthers oblong, basifixed, the thecae parallel, dehiscing longitudinally; ovary superior, conical, 2-locular, appearing 4-locular due to pseudoseptae and proliferation of placentae; style equal to or slightly shorter than stamens, the stigma subcapitate, 2-lobed. FRUIT a capsule, with 4 locules formed by septum and pseudoseptae, with enlarged placentae, dehiscing regularly along 4 sutures or irregularly, erect or pendent, green, whitish green or purple, elliptic, ovoid to globose, pedicellate; pericarp glabrate to pubescent, covered with spines in ours. SEEDS 200-400 per capsule, black, brown or red-brown, reniform to discoid, compressed, with caruncle (a white food body on fresh seed, associated with ant dispersal) in species with pendent fruits; embryo circinate in endosperm; seedling epigeous, the cotyledons narrow-ovate, petiolate. $2n = 24$. —13 native spp. in New World, principally Mex. and adjacent sw U.S. (perhaps derived from Arabic "*tatorah*" or Hindustani "*Dhatura*"). Barclay, A. S. 1959. *Studies in the Genus Datura (Solanaceae) I. Taxonomy of the subgenus Datura*. Cambridge, MA: unpublished Ph. D. thesis, Harvard University.

All parts of the plant are poisonous and may cause dizziness, vomiting, dermatitis, permanent mental disorder and death. The common English name, Jimsonweed, is derived from

Jamestown, Virginia, where British troops were poisoned by eating the foliage. Some Indian names refer to its narcotic effect or sacredness. Among many Native Americans, these plants, especially *D. discolor* and *D. wrightii*, are seriously respected. They are used for medicinal and ritual purposes and non-Indians are prohibited from talking about, photographing or disturbing these plants on Indian lands. Among Mexicans and people of Mexican descent, toloache is an important medicinal plant and, sometimes, is used in attracting and holding mates. The poisonous, therapeutic and ritual properties are attributed to tropane alkaloids, such as atropine, hyoscyamine and scopolamine which are used by the pharmaceutical industry.

1. Fruit erect, dehiscent along 4 sutures to the base; fresh seeds without caruncle; flowers 5-10 long; corolla limb with 5 interacuminal sinuses.
 2. Spines of capsule noticeably of unequal length with 4 (or more) long terminal spines; leaves pinnately lobed *D. quercifolia*
 2. Spines of capsule of more-or-less of equal length; leaves coarsely sinuate-dentate *D. stramonium*
- 1' Fruit pendent, dehiscent along 4 sutures but not to base or irregularly; fresh seeds with caruncle; flowers usually longer than 10 cm; corolla limb with 5 interacuminal lobules.
 3. Pericarp dehiscent regularly into 4 equal valves; flower length at anthesis usually less than 15 cm; corolla throat with purple band; corolla limb with prominent interacuminal lobules, usually longer than acumens; acumen deltate; leaves widely ovate; seed black, the testa rugose without cordlike margin *D. discolor*
 - 3' Pericarp dehiscent irregularly, not producing 4 equal valves; flower 15 cm long or greater; corolla throat without purple band; corolla limb without prominent interacuminal lobules, usually shorter than acumens; acumen narrowly triangular, often with a tendril-like tip; leaves ovate; seed brown, the testa smooth with cordlike margin *D. wrightii*

***Datura discolor* Bernhardt** (of another color). Toloache (Spanish: from Nahuatl, toloa), Kododop (Pima). —Annual or short-lived perennial herb, glabrate to pubescent, with a short, slightly swollen tap root. LEAVES widely ovate, 5-18.5 cm long, 3-16 cm wide, both surfaces variously pubescent, acute, entire to few lobed or dentate, truncate to subtruncate. FLOWERS with calyx 4-8 cm long, the teeth ovate, acute or acuminate, 5-15 mm long, the base persistent, rotate or reflexed; corolla white with purple throat, the tube (8-)10(-15) cm long, the limb 4-8 cm wide, the acumens acute to acuminate, 1-10 mm long. FRUITS pendent, dehiscent along 4 sutures at least half the length, green to purple, subglobose, 2.5-4 cm in diameter, with 200-300 spines, these 1-3.2 cm long; pericarp glandular-puberulent; persistent calyx base rotate or reflexed. SEEDS black, reniform, 3-4.5 mm long, 2.4-3.5 mm wide, rugose; caruncle white, present in fresh seeds. —Roadsides and waste grounds: Cochise, Graham, La Paz, Maricopa, Pima, Pinal, Yavapai, Yuma cos.; usually below 600 m (2000 ft), although up to 1750 m (5500 ft); Mar-Oct, also sporadically after rains. se CA, s AZ; Baja C., Son., Chih. to s MEX.

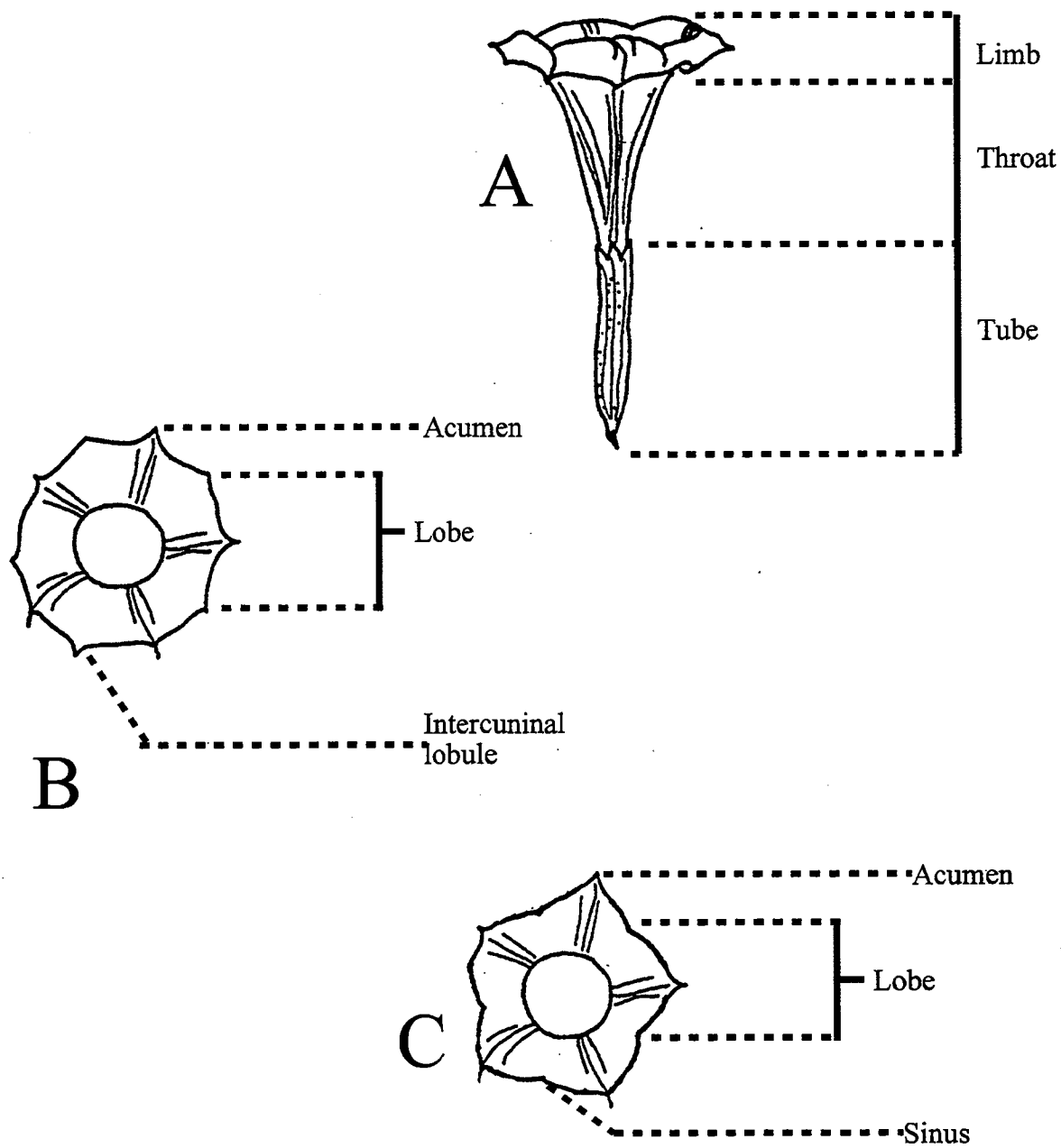
***Datura quercifolia* HBK.** (oak leaf). Oak-leaved Thornapple, Toloache. —Annual herb, glabrate to pubescent, with a short, weak tap root. LEAVES ovate, 6-16 cm long, 3-6 cm wide, the upper surface glabrescent, the lower surface pubescent (usually along veins), acute, pinnately lobed, the lobes often toothed; base cuneate to subcordate; petioles sometimes as long as or longer than blade. FLOWERS with calyx 1.5-4 cm long, the teeth acute to acuminate, 2-6 mm long; corolla white, light violet to purple, the tube 3.8-7.7 cm long, the limb 1-2 cm wide, the acumens acuminate, 1-3 mm long. FRUITS erect, dehiscent along 4 sutures to base, green, ovoid to ellipsoid, 3-4.5 cm long, with 100-300 spines, the terminal spines 2-3.5 mm long, the other spines 0.5-1.5 mm long; pericarp glabrate to puberulent; persistent calyx base reflexed. SEEDS reniform to discoid, 3-4.5 mm long, 2.5-3.5 mm wide, rugose. —Roadsides and waste grounds:

Cochise, Greenlee, Santa Cruz cos.; 1200-1850 m (4000-6000 ft); May-Oct se CA, s AZ, s & c NM, TX; Baja C., Son., Chih. to c Mex.

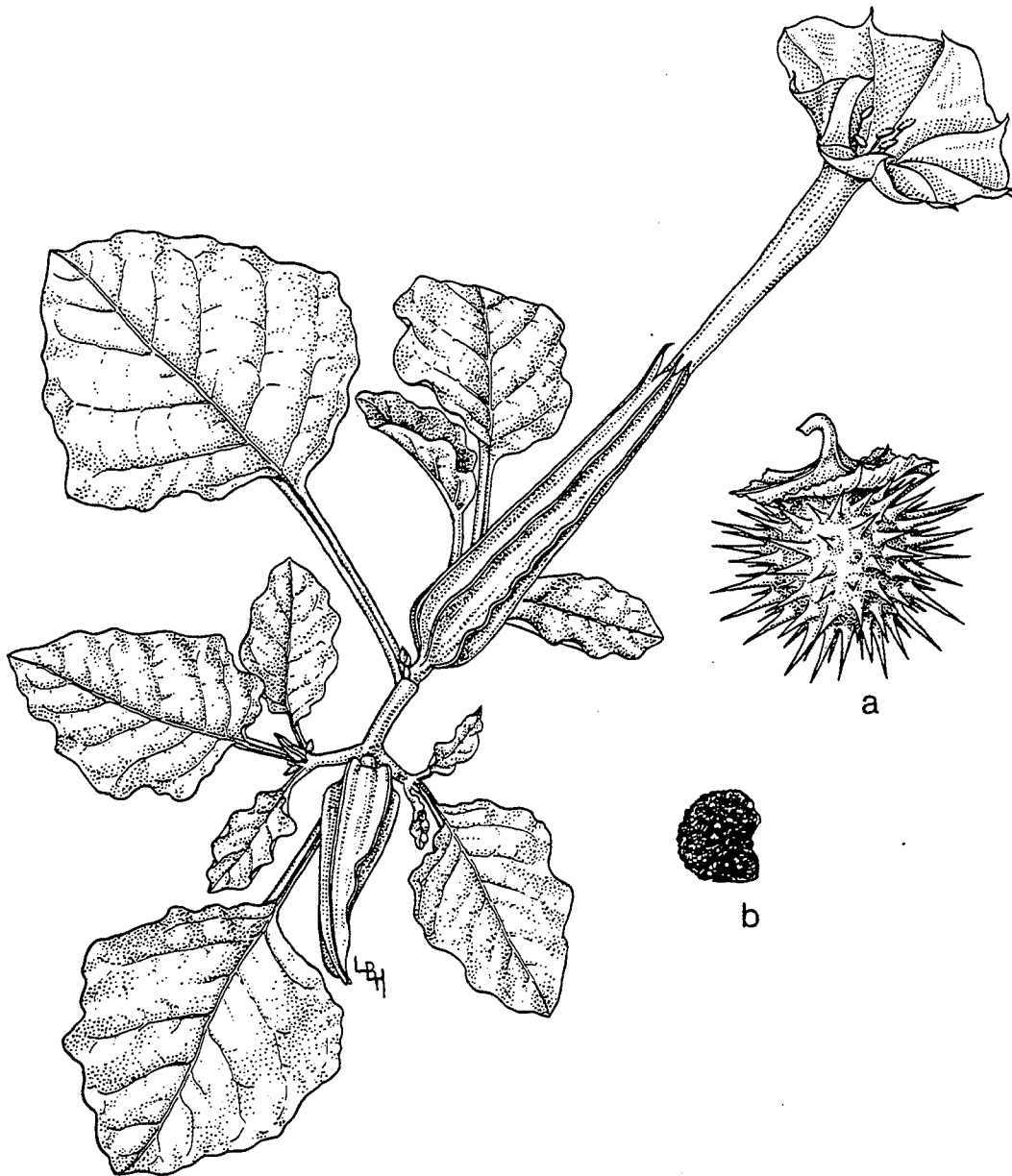
***Datura stramonium* L.** (*Stramonium*, an old generic name). Jimsonweed, Toloache, Tc'coxwotjilyaaiah (Navajo: "spruce that one wraps around a hurt"). —Annual herb, glabrate to pubescent, with a short, weak tap root. LEAVES ovate, oblong to elliptical, 5-21 cm long, 4-15 cm wide, usually puberulent along veins, later glabrescent, sinuate-dentate to -lobed; apex acute; base cuneate to subcordate; petioles usually about half as long as blade. FLOWERS with calyx 3-6 cm long, the teeth lanceolate to acuminate, (3-)5-7(-10) mm long; corolla white, tinged with lavender or purple, the tube 5-10 cm long, the limb 3-5 cm wide, the acumens subulate, 4-8 mm long. FRUITS erect, dehiscing along 4 sutures to base, green, ovoid to ellipsoid, 3-5 cm long, with 100-300 spines, these 0.8-1.5 mm long; pericarp glabrate to puberulent; persistent calyx base reflexed. SEEDS black, reniform to discoid, 3-4 mm long, 2-3.5 mm wide, rugose. —Roadsides and waste grounds: Cochise, Gila, Navajo, Pima, Santa Cruz cos.; 950-1750 m (3200-5500 ft); Apr-Nov; naturalized throughout the US; native to tropical AMER. The name *D. tatula* L. has been applied to forms with purplish flowers, leaves and stems.

***Datura wrightii* hort. ex Regel** (for Charles Wright). Sacred Datura, Toloache, NtíGiliitshoh (Navajo: "sunflower, large"), man-oph-weep (Southern Piate), A'neglakya (Zuni: name of mythic boy), U'teawe ko'hanna (Zuni: flowers, white). —Perennial herb, pubescent, with a long, tuberous root. LEAVES ovate, 10-23 cm long, 5-12 cm wide, the upper surface puberulent to glabrescent, the lower surface canescent, especially along veins, entire, irregularly dentate to lobed; apex acute; base cuneate to rounded. FLOWERS with calyx 6.5-14.5 cm long, the teeth acute to acuminate, 10-35 mm long; corolla white to pale violet or lavender, the tube (14-)16-26 cm long, the limb 7-15 cm wide, the acumens acuminate to linear triangular, often with a tendril-like tip, 7-40 mm long. FRUITS pendent, capsule dehiscing irregularly, green to whitish green, subglobose to globose, 3-4 cm in diameter, with 300-400 spines, 0.6-1 cm long; pericarp puberulent; persistent calyx base appressed, sometimes rotate or reflexed. SEEDS brown to red-brown (sometimes black), reniform, 4-6 mm long, 3-5 mm wide, smooth, with a cord-like triple ridge on convex edge; caruncle white, present in fresh seeds. —Roadsides, waste grounds and arroyo margins: all cos.; 1220-1850 m (4000-6000 ft); May-Oct, s & c CA, s NV, s UT, AZ, sw CO, NM, OK, TX; Baja C., n Son., & n Chih. In the past this plant has been referred to as *Datura meteloides* of authors, not Dunal.

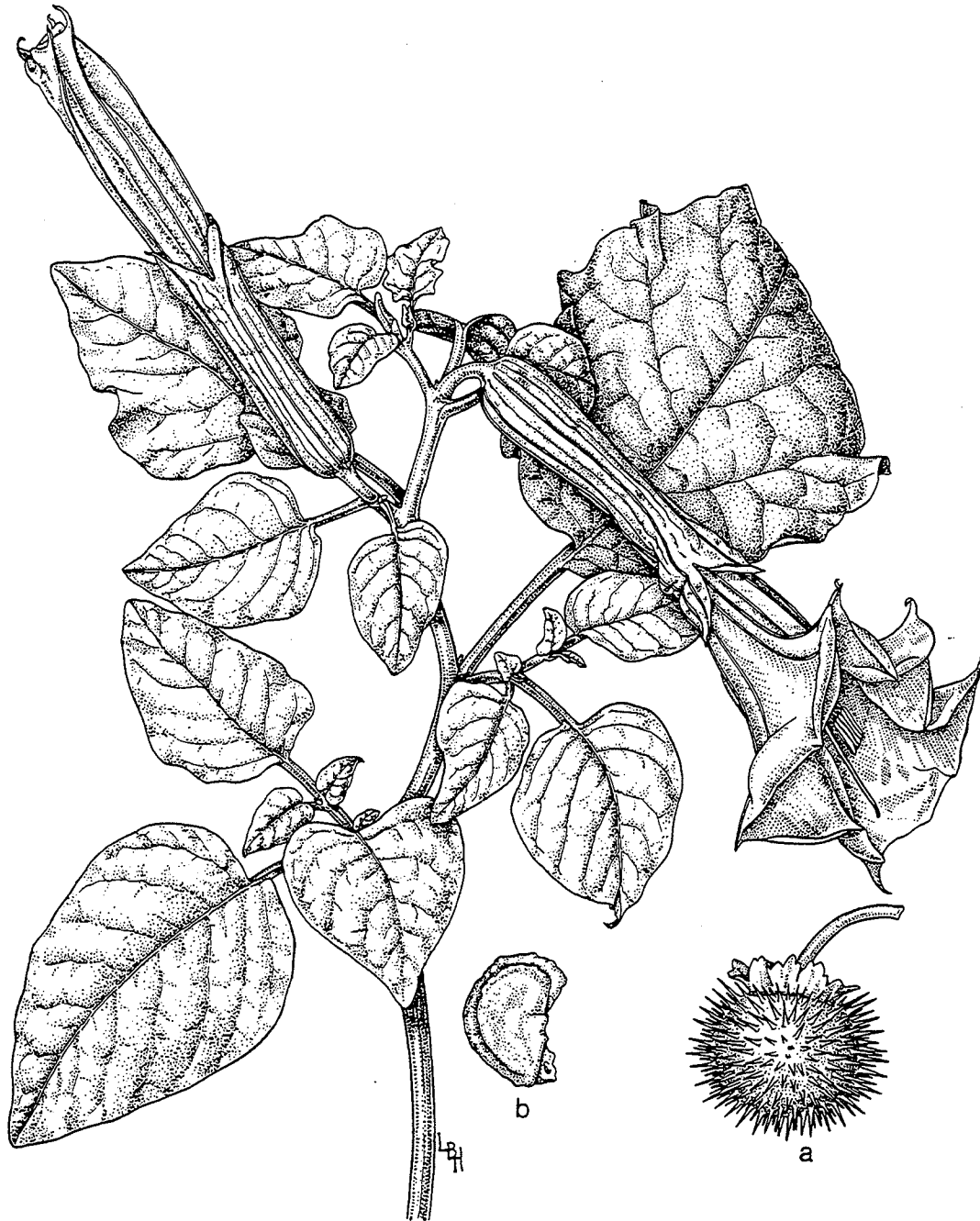
NOTE: *Datura ceratocaula* Ortega, a semiaquatic annual with the calyx usually split along one side resulting in spathe-like structure, the corolla limb with 5 interacuminal sinuses, and the fruit smooth and pendent, has been collected recently in sw NM and n Chih. It may be found in se AZ in shallow temporary ponds along roadsides and in ephemeral water holes where cattle gather. It is native to the highlands c MEX. and appears to be moving northward in response to human disturbance.



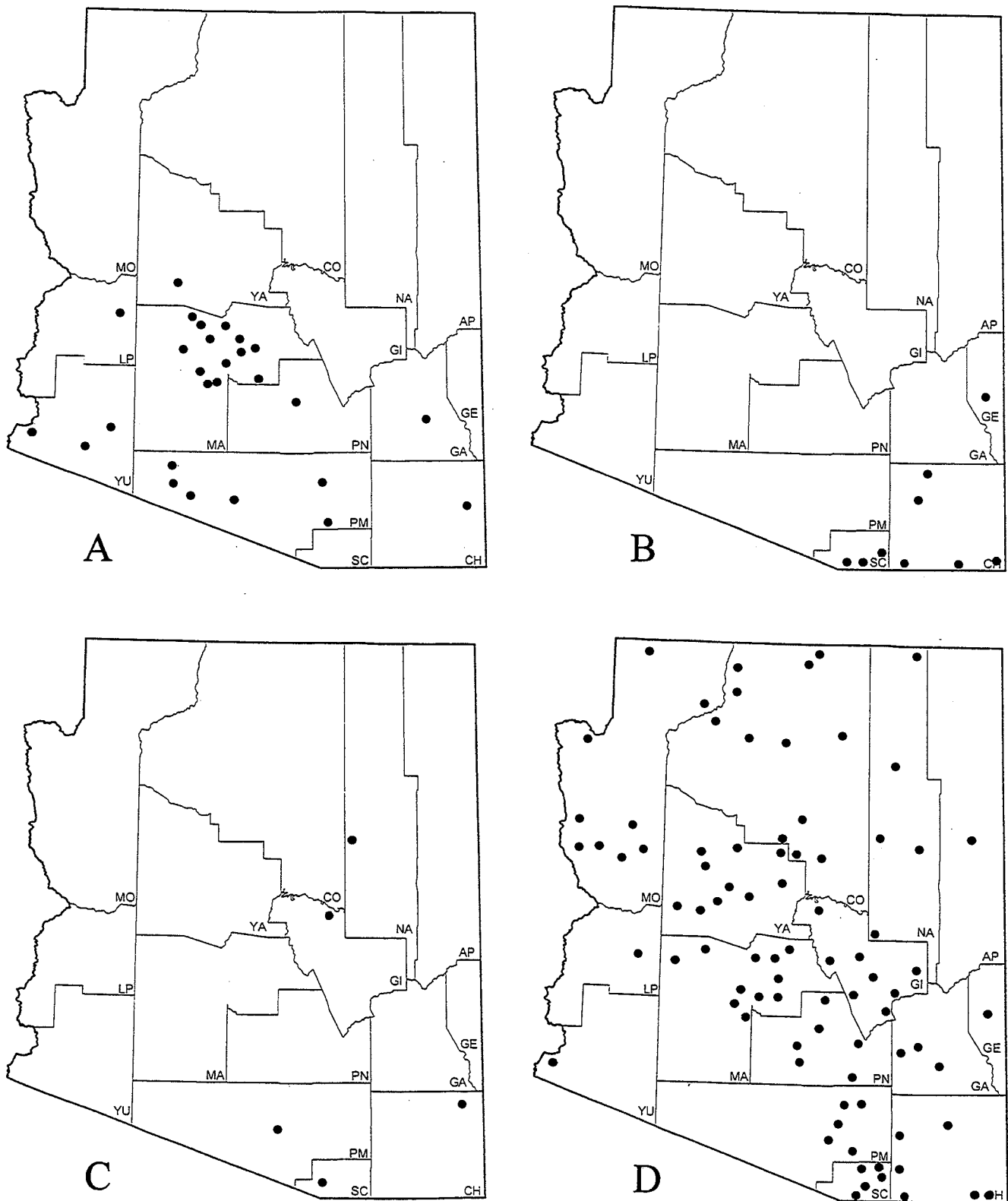
Solanaceae Fig. 1. Flowers of *Datura*. *D. wrightii*: A, side view showing corolla limb, throat, and tube (mainly hidden by calyx); B, limb from above. *D. discolor*: C, limb from above.



Solanaceae Fig. 2. *Datura discolor*. Leafy branch with flowers. a. Spiny fruit. b. Seed. Reproduced with permission from *Arizona Weeds* by Kittie F. Parker (1972), University of Arizona Press, Tucson. Drawn by Lucretia Breazeale Hamilton.



Solanaceae Fig. 3. *Datura wrightii*. Leafy branch with flowers. A, Spiny fruit; B, Seed. Reproduced with permission from *Arizona Weeds* by Kittie F. Parker. (1972), University of Arizona Press, Tucson. Drawn by Lucretia Breazeale Hamilton.



Solanaceae Fig. 4. Distribution of: A, *Datura discolor*; B, *D. quercifolia*; C, *D. stramonium*; D, *D. wrightii*.