

SIMAROUBACEAE SIMAROUBA, QUASSIA FAMILY

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Trees or shrubs, usually dioecious, often bitter due to triterpenoid lactone compounds called quassinoids. LEAVES alternate or rarely opposite, pinnately compound or simple. INFLORESCENCE a panicle or raceme, or flowers solitary. FLOWERS actinomorphic; sepals 3-8, more or less connate, imbricate, or valvate; petals 3-8, distinct or connate; disk prominent; stamens usually twice as many as the petals; carpels 2-8, usually distinct or only partially connate; ovary superior. FRUIT a capsule (often schizocarpic), drupe, or samara. --Ca. 25 genera, ca. 150 spp., chiefly tropical and subtropical. Some species have been used medicinally.

1. Unarmed trees to 20 m tall; leaves up to 1 m long, pinnately compound; fruit of 1-5 basally united samaras *Ailanthus*
- 1' Thorny shrubs or small trees to 5 m tall; leaves lacking or (if present) scale-like, less than 1 mm long; fruit a star-shaped cluster of 5-8 drupes *Castela*

Ailanthus Desf.

Trees unarmed, polygamodioecious; bark gray. LEAVES large, deciduous, odd-pinnately compound, malodorous when bruised. INFLORESCENCE a large terminal panicle. FLOWERS malodorous (especially the staminate ones); calyx lobes 5-6; petals 5-6; stamens 10-12 (staminate flowers) or 2-3 (perfect flowers); ovary 2-5-lobed. FRUITS samaras, 1-5 per flower, each developing from a carpel, more or less pendulous. --Ca. 15 spp.; e Asia, ne Australia. (Supposed oriental [Moluccan] name meaning tree of heaven.)

Ailanthus altissima (Miller) Swingle (very tall). Tree of Heaven, Homestead Tree. --Rapidly growing tree to 20 m tall, sometimes producing clonal thickets via rhizomes; young parts more or less glandular-puberulent; bark smooth; wood soft, brittle, with a broad pith. LEAVES (1-)3-10 dm long; leaflets 9-31, (5-)8-15 cm long, lanceolate, with (1-)2-4(-6) large glands on the margin below, these situated near the base, terminating a small tooth or lobe. INFLORESCENCES 1-4 dm long. FLOWERS small, greenish to whitish; calyx less than 1 mm long; petals 2-3 mm long, woolly on and near the proximal margins; filaments pubescent basally; disk lobed; ovary with 2-5 flat 1-carpellate divisions. SAMARAS 3-5 cm long, linear, curved or oblique at the base, twisted 1/2 turn at the apex; seed-bearing portion near the center, 3-7 mm wide. $2n = 64$. --Weedy cultivated tree, escaping and persisting especially near buildings, roads, streams, and washes: to be expected in all AZ cos. but not documented for Apache, Graham, La Paz, Mohave, Navajo, and Yuma; at least 350-1700 m (1100-5500 ft); Apr-Jun; extensively planted in the U.S., often escaping and persisting, native to China. Its hardiness, including pollution tolerance, has encouraged its cultivation.

Castela Turpin

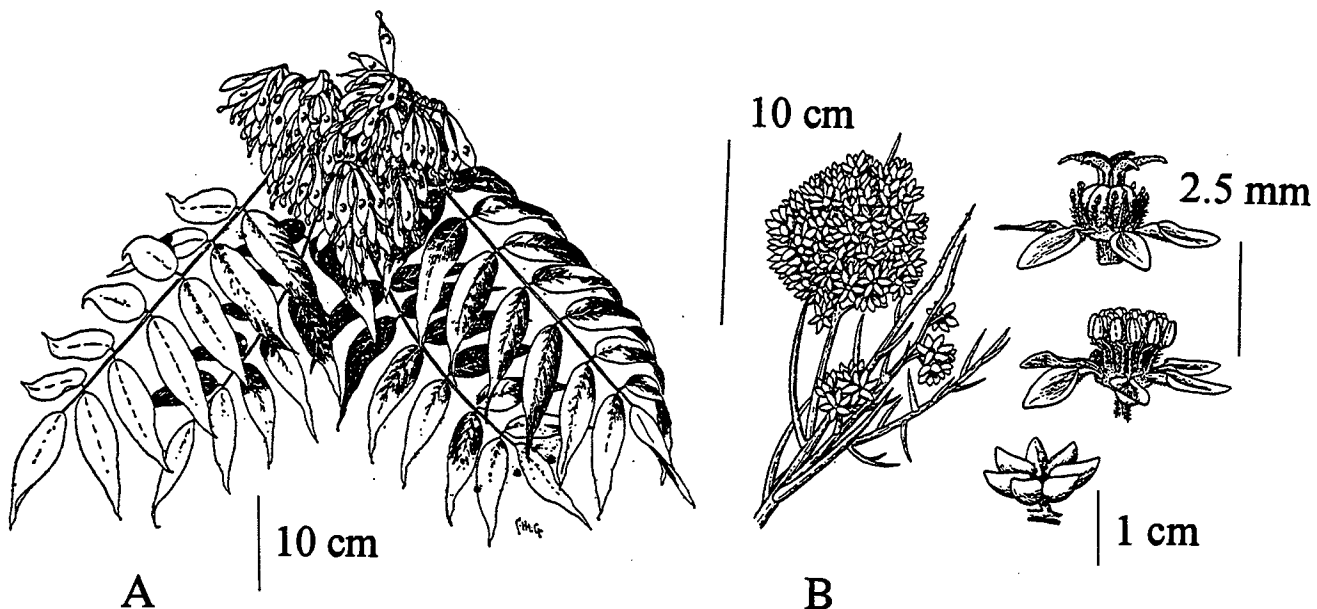
Dioecious shrubs or small trees, most with at least some spinose branchlets; stems green. LEAVES alternate, simple, mostly less than 5 cm long, sometimes scalelike and caducous (as in ours), or mostly persistent. INFLORESCENCE a much-branched axillary panicle of cymules or reduced to various degrees, even to a single flower. FLOWERS imperfect, 4-8-merous; petals several times larger than sepals; stamens mostly 2-3 times as many as petals, inserted around a glandular disk; pistils mostly as

many as sepals, each with one ovule, separate below, united by the styles, the stigmas separate. FRUIT a star-shaped cluster of carpels joined centrally, each carpel at maturity nearly dry, laterally compressed, drupe-like, deciduous or persisting for several years. --Ca. 15 spp. sw & sc U.S. to S. Amer. (For R. R. L. Castel). Moran, R. and R. Felger. 1968. *San Diego Soc. Nat. Hist., Trans.* 15:31-40.

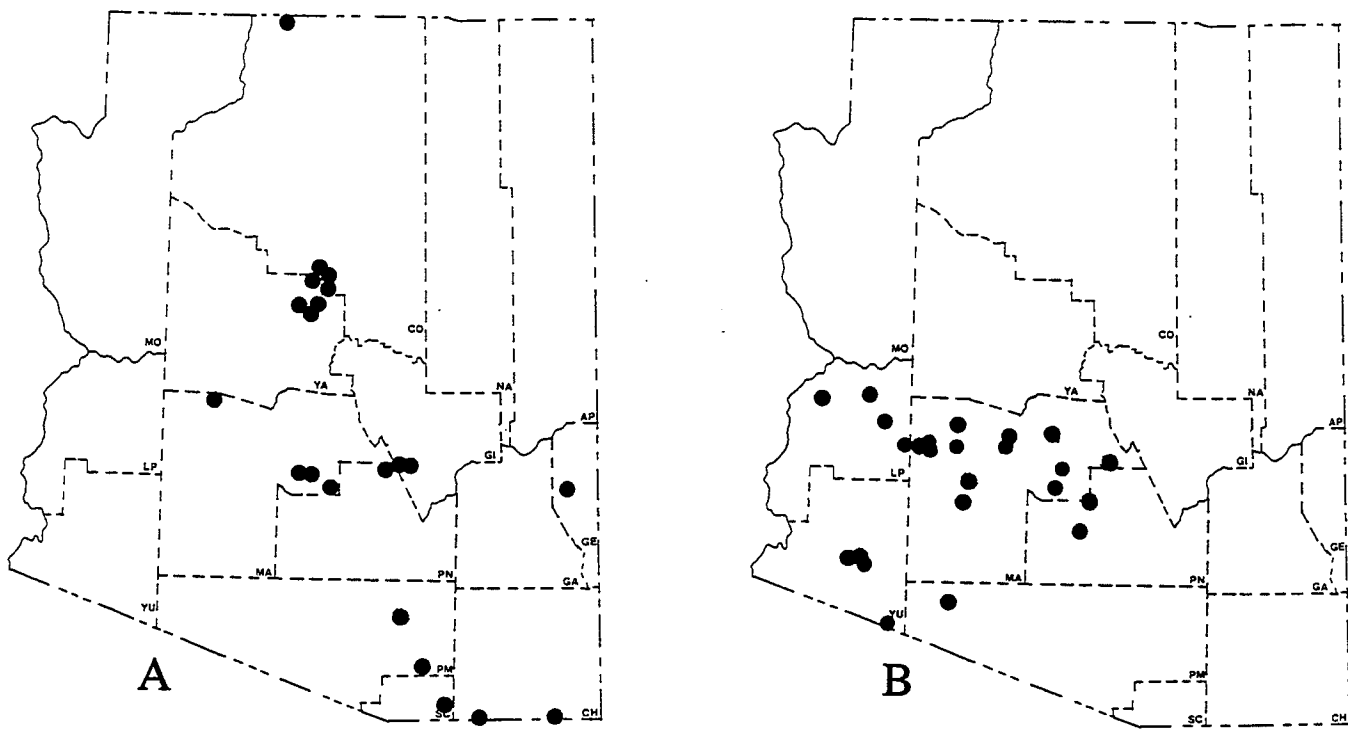
Castela emoryi (A. Gray) Moran & Felger (For W. H. Emory). Crucifixion Thorn, Corona de Cristo. --Rigid, intricately branched shrubs or small trees, to 5 m tall; branchlets all spinose; young parts densely puberulent. SEEDLING LEAVES linear to lanceolate, 1-1.5 cm long. ADULT LEAVES reduced to scales less than 1 mm long, deciduous early. STAMINATE INFLORESCENCE a simple, spikelike, stiff panicle 0.5-12 cm long. PISTILLATE INFLORESCENCE a much-branched, conical, crowded, stiff panicle, 1-10 cm long. FLOWERS 3-7 mm in diam., (5-)6-8-merous; sepals deltoid, 1-2.5 mm long; petals oblong to ovate-oblong, 2-3.5 mm long; stamens with pubescent filaments, the anthers of pistillate flowers sterile and reduced. FRUITS red to green, tan, or brown, turning black with time, sometimes persisting for years, often densely packed in clusters 10-25 cm long; carpels ovoid but compressed laterally, 6-8 mm long, 5-6 mm wide, 4-8 per flower. $2n = 26$. [*Holacantha emoryi* A. Gray]. --Sonoran Desert plains and dry washes, never abundant: La Paz, Maricopa, Pima, Pinal, Yuma cos.; 150-700 m (500-2300 ft); Jun-Jul; se CA; nw Son., Mex. Two unrelated leafless AZ shrubs are also called crucifixion thorn: *Koeberlinia spinosa* Zucc. (Koeberliniaceae) and *Canotia holacantha* Torr. (Celastraceae). The *Koeberlinia* species additionally shares the common name Corona de Cristo.

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Simaroubaceae Fig. 1. A, *Ailanthus altissima* fruiting branch. From L. H. Bailey, 1935, *The Standard Cyclopedia of Horticulture*, Macmillan, New York. B, *Castela emoryi* fruiting branch, staminate flower, pistillate flower, and cluster of mature carpels. From P. A. Munz, 1959, *A California Flora*, University of California Press, Berkeley, by permission.



Simaroubaceae Fig. 2. A, distributions of: *Ailanthus altissima*. B, distribution of *Castela emoryi*.