RutaceaeCRue family

Zanthoxylum L.

prickly-ash

Franklin T. Bonner

Dr. Bonner retired from the USDA Forest Service, Southern Research Station, Mississippi State, Mississippi.

Growth habit and use. Most of the prickly-ashesC*Zanthoxylum* spp.Care large shrubs or small trees. The 3 species considered here are listed in table 1. In some areas they provide food and cover for wildlife. Their deciduous foliage is very aromatic, and the bark and fruit were once used for medicinal purposes, both as home remedies and in the drug industry (Vines 1960). The wood of espino rubial is used for boxes, pallets, local construction, and some furniture (Francis 1991).

Flowering and fruiting. The greenish white dioecious flowers are borne in inconspicuous axillary cymes on common prickly-ash and in large terminal cymes 5 to 15 cm in length on Hercules-club and espino rubial (figure 1) (Sargent 1965; Francis 1991). Phenological data are summarized in table 2. Prickly-ash fruits are globose, single-seeded capsules 5 to 6 mm in diameter. During ripening, they turn from green to reddish brown. At maturity, the round, black, shiny seeds hang from the capsules (figures 1, 2, and 3).

Collection, extraction, and storage. Seeds may be stripped from clusters of mature capsules by hand as the capsules open, or entire clusters of unopened capsules may be picked when they turn reddish brown. Unopened capsules will discharge their seeds with gentle flailing after several days of air-drying. Seeds can be separated from capsule fragments by screening or winnowing (table 3). There are no storage test data known for this genus, but the seeds are probably orthodox in storage behavior. They can be dried to 10% moisture content without loss of viability, and seeds of common prickly-ash showed practically no loss in germinability after 25 months of storage in sealed containers at 5 °C (Bonner 1974).

Germination. Seeds of common prickly-ash and Hercules-club exhibit strong dormancy, apparently imposed by the seedcoat. Scarification with concentrated sulfuric acid for 2 hours at about 21 °C has given fair results for Hercules-club, and stratification in moist sand for 120 days at 5 °C has helped germination of common prickly-ash (Bonner 1974). Germination of treated seeds of both species has been tested at diurnally alternating temperatures of 20 to 30 °C. (table 4). Seeds of espino rubial may have a similar dormancy, but there are no conclusive data. Untreated seeds sown in Puerto Rico produced only 5% germination (Francis 1991).

Nursery practice. Until more effective pregermination treatments are developed, fall sowing of untreated seed immediately after collection is recommended. Germination is epigeous (figure 4). Vegetative propagation from root cuttings and suckers is also possible (Dirr and Heuser 1987).

Literature Cited

Bailey LH. 1949. Manual of cultivated plants most commonly grown in the continental United States and Canada. Rev. ed. New York: Macmillan. 1116 p.

Bonner FT. 1974. *Zanthoxylum* L., prickly-ash. In: Schopmeyer CS, tech. coord. Seeds of woody plants in the United States. Agric. Handbk. 450. Washington, DC: USDA Forest Service: 859B861.

Dirr MA, Heuser CW Jr. 1987. The reference manual of woody plant propagation: from seed to tissue culture. Athens, GA: Varsity Press. 239 p.

Francis JK. 1991. *Zanthoxylum martinecense* (Lam.) DC., espino rubial. SO-ITF-SM-42. New Orleans: USDA Forest Service, Southern Forest Experiment Station. 5 p.

Little EL Jr. 1979. Checklist of United States trees (native and naturalized). Agric. Handbk. 541. Washington, DC: USDA Forest Service. 375 p.

Sargent CS. 1965. Manual of the trees of North America. New York: Dover. 934 p.

Vines RA. 1960. Trees, shrubs, and woody vines of the Southwest. Austin: University of Texas Press. 1104 p.

Figure 1C*Zanthoxylum clava-herculis,* Hercules-club: cluster of mature fruits, × 1.

Figure 2C*Zanthoxylum clava-herculis,* Hercules-club: single carpel and seed, × 4.

Figure 3C*Zanthoxylum americanum,* common prickly-ash: longitudinal section of a seed, × 6.

Figure 4C*Zanthoxylum americanum,* common prickly-ash: seedling development at 1, 3, 13, and 18 days after germination.

Table 1C*Zanthoxylum,* prickly-ash: nomenclature, occurrence, and size

Scientific name	Common name	Occurrence	Height at maturity (m)
***Z. americanum* Mill.**	**common prickly-ash,** toothache-tree, northern prickly-ash	Quebec to North Dakota, S to Oklahoma & Georgia	8
Z. clava-herculis* L. var. *clava-herculis	**Hercules-club,** toothache-tree, southern prickly-ash, tingle-tongue, pepperbark	Oklahoma & Virginia, S to Florida & Texas	9B15
***Z. martinicense* (Lam.) DC.**	**espino rubial,** pino macho, ayúa, yellow hercules, bosú	Greater & Lesser Antilles, Trinidad & Tobago, E Venezuela	20B25

Sources: Bailey (1949), Francis (1991), Little (1979), Sargent (1965).

Table 2C*Zanthoxylum,* prickly-ash: phenology of flowering and fruiting

Species	Flowering dates	Fruit ripening dates
Z. americanum	AprBMay	JuneBAug
Z. clava-herculis	AprBJune	JulyBSept
Z. martinicense	AprBMay*	AugBSept

Sources: Vines (1960), Bonner (1974), Francis (1991).
* Primarily, but throughout the year in some areas.

Table 3C*Zanthoxylum,* prickly-ash: seed data

Species	Place collected	Seed moisture (%)	Cleaned seeds/wt Range /kg	Range /lb	Average /kg	Average /lb	Samples
Z. americanum	Minnesota	C	48,100B72,590	21,800B32,900	56,490	25,600	3
Z. clava-herculis	Mississippi	10	33,100B37,050	15,000B16,800	35,000	15,900	2
Z. martinicense	Puerto Rico	C	C	C	75,000	34,020	C

Sources: Bonner (1974), Francis (1991).

Table 4C*Zanthoxylum,* prickly-ash: germination test conditions and results

		Germination test conditions					Germ. rate		Germ. percentage	
		Daily		Temp (°C)			Amt.		Ave.	
Species	Pregerm. treatment	light (hr)	Medium	Day	Night	Days	(%)	Days	(%)	Samples
Z. americanum	Stratified*	24	Sand	30	20	60	20	20	24	1
Z. clava-herculis	H_2SO_4	8	Blotter paper	30	20	45	29	19	31	3

Source: Bonner (1974).
Germ. = germination.
* In moist sand at 5 °C for 120 days.