# *Vochysia ferruginea* Mart.

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## VOCHYSIACEAE (VOCHYSIA FAMILY)

*Cucullaria ferruginea* (Mart.) Spreng. 1987 and *Vochysia tomentosa* Seem. 1852 (Flores 1993a)

Areno colorado, barbachele, botarrama, cedro rama, chancho colorado, dormilón, flor de mayo, laguno, malagueto, mayo, mayo colorado, mecri, orcano, palo de mayo rosado, palo malín, palo santo, pegle, quaruba, quillu-sisa, saladillo, sorogá, tecla, yumeri, zopilote

In Central America *Vochysia ferruginea* grows in Nicaragua, Costa Rica, and Panama. In South America its distribution ranges from Colombia and Venezuela to Ecuador, Peru, Brazil, and the Guayanas (Whitmore and Hartshorn 1969). Other species frequently growing in association with *V. ferruginea* are *Laetia procera* (Poepp.) Eichler., *Goethalsia meiantha* (Donn. Sm.) Burret, *Pentaclethra macroloba* (Willd.) Kuntze, and *Simarouba amara* Aubl. (Manta 1988).

*Vochysia ferruginea* is a fast-growing, medium-to-tall tree that reaches 20 to 34 m in height and 40 to 80 cm d.b.h. The tree has a clear trunk up to one-half its total height and a dense, wide crown formed by ascendant branches. Growth rates in plantations in Costa Rica range from 2.7 cm to 4.8 cm d.b.h. per year and from 1.8 m to 3.2 m in height per year during the first 3 years (Rodríguez 1997). It grows well on poor, acidic but well-drained soils. It grows naturally in upper slope soils and on well-drained ridges but adapts to other conditions. In its natural habitat, *V. ferruginea* grows in humid lowland forests with annual rainfalls ranging from 2500 to 5000 mm and temperatures between 24 and 30 °C. Growing at elevations between sea level and 1500 m, the tree is common in the medium strata of the primary rainforest and is frequently found in secondary forests (Finegan and Sabogal 1988). It also grows on abandoned pastures and invades forest clearings. Natural regeneration of the species is abundant, often resulting in nearly pure stands. *Vochysia ferruginea* belongs to the group of fast-growing species that establish themselves under the forest canopy but require gaps in the canopy for their development (Manta 1988).

The wood is relatively light, with a density of 0.33 to 0.42 g per $cm^3$ and a medium specific gravity of 0.37. It has an attractive light brown color with beige to rose-colored veining and is easy to work with. The wood dries easily and relatively fast and is moderately resistant to insects and fungi (Instituto Nicaraguense de Recursos Naturales y del Ambiente 1992). It is used for boxes, furniture, boards, panels, veneer, window frames, and toys and in cabinet making (Carpio 1992).

In the northern region of Costa Rica, *V. ferruginea* flowers in May and June (Arnáez and Moreira 1995) and in the southern region between March and May. Occasionally, flowering is observed in September and October (Asociación Costarricense para el Estudio de las Especies Forestales Nativas 1994). The inflorescences are narrow, densely pubescent, axillar or terminal panicles and are composed of numerous showy, dark yellow, zygomorphic flowers. The obovate or oblong fruits are capsules 2 to 4 cm long that consist of three compartments, one for each seed. However, the fruits usually contain only two seeds; the third compartment is either empty or the seed is only partially developed. The one-winged seeds are laterally compressed, 2 to 3 cm long, and brown. They are surrounded by a membranous testa and contain no endosperm. Seed sizes vary greatly among individual trees (Müller 1997).

In the northern region of Costa Rica, fruits are collected in the months of September and October. Fruiting varies widely among individual trees and among years. The ripe capsules open while still on the tree. Therefore, they must be collected as soon as the seams between the three compartments turn visibly brown. The fruit panicles are cut from the ends of the branches with telescopic pruning shears.

After collection, the fruits are dried on screens in well-ventilated, open areas with no direct sunlight. After 1 to 3

days, the capsules open and the seeds can be extracted manually or by shaking the screens (Rodríguez 1996). Because all fruits on a tree do not open simultaneously, about 50 percent of the collected fruits do not open and must be discarded (Müller 1997). In northern Costa Rica, the number of fruits per kg averages 831 and an average of 748 seeds can be extracted from each kg of fruits. The seeds contain an average of 3.7 percent impurities, rudimentary seeds, and wings. The extra wings (1.7 percent on the average) stick to the slightly fuzzy wings of the intact seeds and cannot be separated by seed blowers or screens (Müller 1997). In northern Costa Rica, seeds average 32,130 per kg. The average 1,000-seed weight is 32 g, and the moisture content of fresh seeds is 25 percent.

Seeds should be stored without drying at 15 ºC for no longer than 3 months. Under natural conditions, seeds lose their viability in less than 1 month (Rodríguez 1996). They can be dried to 4 percent moisture content without losing viability but remain sensitive to temperatures below 10 °C. After 1 month of storage at 7 percent moisture content, the germination percentage was still high (70 to 80 percent); however, it dropped drastically after 3 months of storage (Müller, 1997). Storage beyond 3 months does not seem to be possible because seeds lose almost all viability.

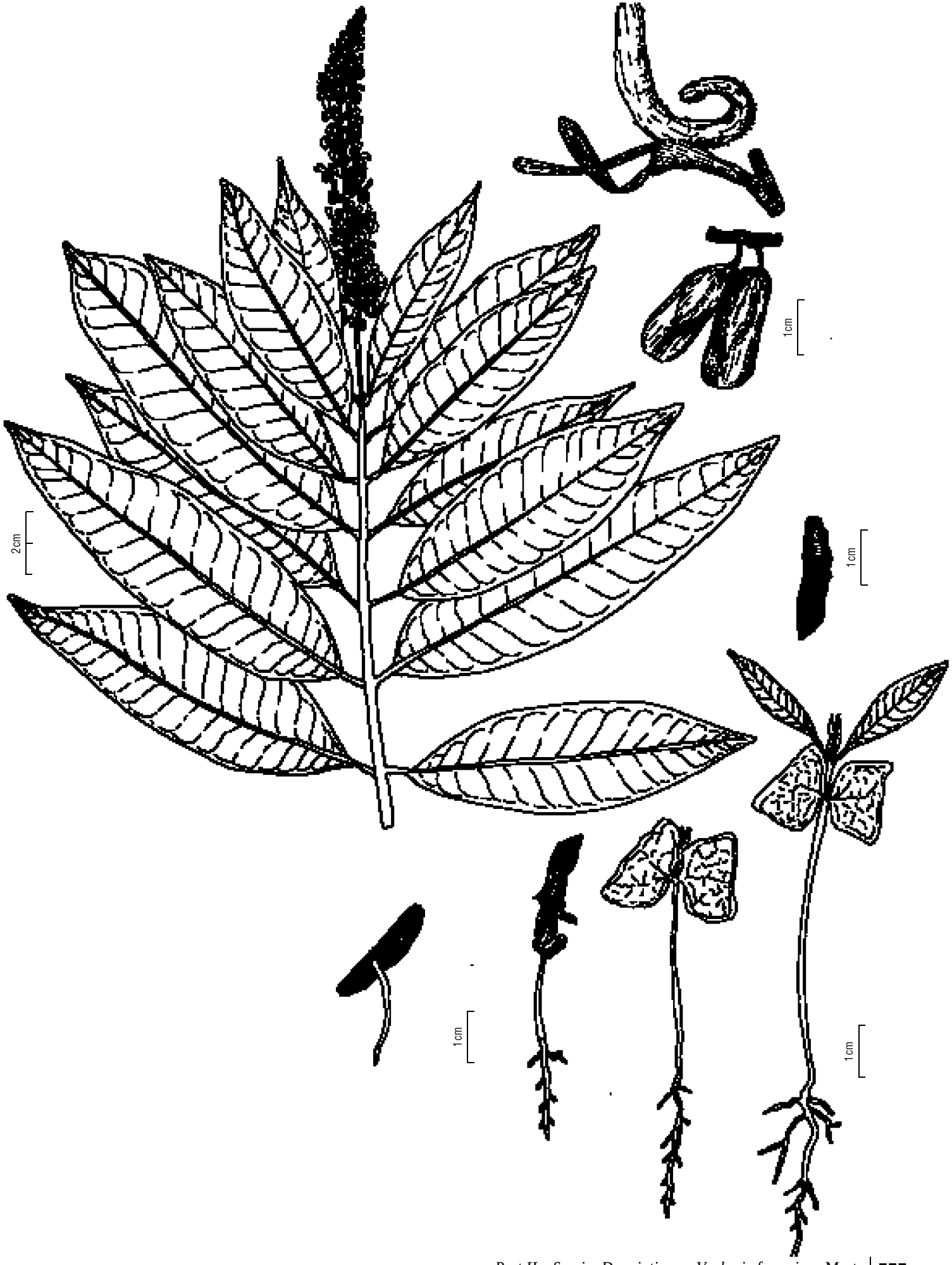
Seeds do not require pretreatment to improve germination (Rodríguez 1996). Under laboratory conditions and sowed flat on top of sterilized sand, they begin to germinate after 4 or 5 days. The germination rate is highest on the seventh day, and after approximately 16 to 18 days, germination is complete. The average germination percentage under these conditions is 97 percent, and often reaches 100 percent (based on germination tests with 4 x 50 seeds, in germination chambers with 12 hours light at 29 °C and 12 hours darkness at 24 °C) (Müller 1997).

In the nursery, seeds of *V. ferruginea* are usually sowed in germination beds, using a mix of sand and soil, which facilitates subsequent transplanting. To control plant density, seeds should be sowed individually in a horizontal position. They are then slightly covered with the substrate. The seedlings are transplanted when the first two real leaves develop. Most nurseries produce seedlings in plastic bags, which are ready for outplanting after 4 to 5 months (Rodríguez 1997). Experiments with stump planting (in Costa Rica: pseudoestacas) have not been successful (Ulate 1996).

## ADDITIONAL INFORMATION

Depredation of the unripe fruits by parrots is a serious problem in Costa Rica. It often results in significant losses because parrots can destroy the seed crop of a tree within a few hours.

According to chemical analysis carried out by the Universidad Nacional and the Universidad de Costa Rica, the seeds contain 34.4 percent lipids, 9.9 percent proteins, and 2.4 percent starch. Similar results were obtained elsewhere (Flores 1993a).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