

***Furcraea foetida* (L.) Haw.**
AGAVACEAE

Mauritius hemp

Synonyms: *Furcraea gigantea* Vent.
Agave gigantea D. Dietr.



General Description.—Mauritius hemp, also known as green aloe, female karata, maguey, mayuey criollo, cocuisa, giant cabuya, and aloes vert, is a robust shrub with a basal rosette about 2.5 to 3.5 m in diameter and flowering stalks 5 to 10 m in height. The plant can be called a shrub because it is perennial, because it is shrub size, and because it has a fibrous-woody sheath surrounding the core of the short stem (20 to 30 cm long) within the rosette, and a woody flowering stalk. Mauritius hemp has no taproot, relatively fine lateral roots, and many fine roots. Its green to yellow-green leaves are linear-lanceolate to oblanceolate, pointed at the tip, and are fleshy with thread-like parallel fibers. They are up to 25 cm wide, have marginal spines but lack a terminal spine. The inflorescences (panicles) are terminal and contain many pendulous, fragrant, white, greenish-white, yellowish-green, or pale blue-green, 2.5 to 3.3 long by 1.0 by 1.8 cm wide flowers. Flowers open a few at a time for several weeks. Seed development has not been observed by the author in Puerto Rico and is apparently rare elsewhere. Bulbils 1 to 16 cm long develop abundantly on the peduncles after flower dehiscence. There are $2n = 60$ chromosomes (author's observation, Bailey 1941, Howard 1979, Pacific Island Ecosystems at Risk 2003, Schlegel 2003).

Range.—Mauritius hemp is native to the Greater Antilles, and from Guadeloupe south through

northern South America to Brazil (Grisebach 1963, Howard 1979). The species has been widely planted. It has naturalized in Florida, Hawaii, Marquesas Islands, French Polynesia, Tonga, and is present and probably naturalized in many other places (Pacific Island Ecosystems at Risk 2003).

Taxonomy.—Mauritius hemp in Puerto Rico was known previously as *Furcraea tuberosa* (Miller) Ait. f. (Liogier and Martorell 2000). The current assignment of the species to *F. foetida* is based on the statement by Howard (1979) that *F. foetida* occurred throughout the Antilles and that *F. tuberosa* is endemic to the Lesser Antilles, specifically from St. Barts southward. Characteristics given to separate the two species are unreliable by Howard's own admission. Mature plants examined by the author had maximum leaf widths of 18 to 20 cm, leaf lengths of 1.5 to 2 m, oblanceolate leaves, weak fetid smell of leaf juices, and bulbiferous reproduction. Reliable identification of the Puerto Rican and Caribbean *Furcraea* species will have to wait for further study.

Ecology.—In Puerto Rico, Mauritius hemp grows in moist areas that receive from about 1200 to 2500 mm of mean annual precipitation from near sea level to 1,000 m in elevation. The species grows in all types of well-drained soils, including poor and eroded soils, and frequently grows on rocks, cliffs, and rarely in crotches of trees. It is resistant to short-term drought and salt spray and can survive temperatures as low as -7 to -4 °C. Growth is best in full sun, which most often leads to successful flowering. Mauritius hemp also grows in partial but not heavy shade. When plants are young, competition with tall grass, weeds, shrubs, and trees is a critical limiting factor. Cattle graze and often completely uproot small plants. They are ignored by cattle once they become large (author's observation, Desert-Tropicals Nursery 2003, Pacific Island Ecosystems at Risk 2003). This species, as others of the genus, has crassulacean acid metabolism by which it fixes CO_2 during the night and incorporates it into carbohydrates during the day (personal communication with Ernesto Medina, plant

physiologist, Centro de Ecología, Instituto de Investigaciones, Caracas, Venezuela).

Reproduction.—Flowering, which may occur at any time of the year, apparently begins when plants attain sufficient size and vigor to support the large flower stalk. Plants die about 1 year after the onset of flowering. The flowers are visited by honey bees (*Apis mellifera* L.). There is no record in the literature of seed weights. Fresh bulbils (n = 100) collected by the author in Puerto Rico weighed an average of 2.72 ± 0.31 g/bulbil with a range of 0.18 to 16.27 g. Placed in moist potting mix, 100 percent of them rooted within 1 week. Bulbils are formed by the thousands on single plants and can form dense thickets. Gravity is the only known natural means of dispersal. The presence of scattered individuals indicates other transport, perhaps fruit bats.

Growth and Management.—The best way to artificially propagate Mauritius hemp is to place bulbils in pots of potting mix. A group of bulbils planted in Puerto Rico grow rapidly with no mortality, reached an average of 17.8 ± 0.4 cm in height in 1 month, and were ready to outplant in 1 to 2 months. New plants need protection from weeds for a few months, but afterwards the plants need little care. Individual plants probably live from 5 to 20 years depending on growing conditions. One owner reported that an ornamental plant died after flowering at 15 years old (author's observation). Mauritius hemp is rarely common enough in its native range to need control. When control is needed, particularly in invaded areas, individual plants can be killed by grubbing them out or by spray or drizzle application of 2,4-D or triclopyr in oil (Pacific Island Ecosystems at Risk 2003).

Benefits.—Mauritius hemp helps hold the soil, furnishes cover for wildlife, and adds to the aesthetics of wildlands. The species is widely, although not heavily, used as a landscaping plant for accent and curiosity. A variegated form is available (Desert-Tropicals Nursery 2003). Mauritius hemp was once widely cultivated for fiber, hence the common name. Extracts of the roots are used as ingredients in tonics for purifying the blood, and the dried leaves are used to control swelling and to aid in wound healing (Núñez-Meléndez 1982).

References

- Bailey, L.H. 1941. The standard cyclopedia of horticulture. Vol. 2. The MacMillan Company, New York. p. 1,201-2,422.
- Desert-Tropicals Nursery. 2003. Mauritius hemp, sisal, maguey. http://www.desert-tropicals.com/Plants/Agavaceae/Furcraea_foetida.html. 2 p.
- Grisebach, A.H.R. 1963. Flora of the British West Indian Islands. J. Cramer, Weinheim, Germany. 789 p.
- Howard, R.A. 1979. Flora of the Lesser Antilles, Leeward and Windward Islands. Vol. 3. Arnold Arboretum, Harvard University, Jamaica Plain, MA. 586 p.
- Liogier, H.A. and L.F. Martorell. 2000. Flora of Puerto Rico and adjacent islands: a systematic synopsis. 2nd ed. Editorial de la Universidad de Puerto Rico, Río Piedras, PR. 382 p.
- Núñez-Meléndez, E. 1982. Plantas medicinales de Puerto Rico. Editorial de la Universidad de Puerto Rico, Río Piedras, PR. 498 p.
- Pacific Island Ecosystems at Risk. 2003. *Furcraea foetida* (L.) Haw., Agavaceae. http://www.hear.org/pier_v3.3/fufoe.htm. 3 p.
- Schlegel, R. 2003. Plant breeding update: crop plants II. http://www.desicca.de/plant_breeding/Crop_plants/Crops_II/hauptteil_crops_ii.html. [not paged.].

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