



Furcraea AGAVACEAE

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Furcraea Ventenat (Bull. Sci. Soc. Philom. Paris 1: 65–67, 1793). **Type:** *Furcraea gigantea* Ventenat [type element according to l.c. p. 65; ING (accessed Aug. 2015) incorrectly lists *Agave cubensis* Jacquin (mentioned on p. 66 of the protologue as additional species) as lectotype designated by Britton, Fl. Bermuda, 80, 1918]. — **Agavoideae - Agaveae** — **Lit:** Baker (1879: synopsis); Baker (1888: synopsis); Drummond (1907: synopsis); Trelease (1910: taxonomic notes); Trelease (1915a: synopsis); Trelease (1915b: synopsis Guatemala); Trelease (1920: Fl. Mexico); Standley & Steyermark (1952: Fl. Guatemala); McVaugh (1989: Fl. Novo-Galiciana); Lott & García-Mendoza (1994: Flora Mesoamericana); Álvarez de Zayas (1996: synopsis Cuba); García-Mendoza (1998: revision Mexico & Guatemala); García-Mendoza (2001a: revision); García-Mendoza (2001b: revision arborescent taxa); Guillot Ortiz & Meer (2010: synopsis cultivated taxa Spain); García-Mendoza (2011: Fl. Valle Tehuacán-Cuicatlán). **Distr:** C and S Mexico, C America to Panama, Caribbean Region, Colombia, Ecuador, Venezuela, French Guiana, Guayana, Suriname, Peru, Bolivia, Brazil, Paraguay (the S American range apart from Colombia, Venezuela, Ecuador, Peru and Bolivia, as well as major parts of the Caribbean distribution might be exclusively

anthropogenic). **Etym:** For Antoine F. de Fourcroy (1755–1809), French politician and chemist, 1784 director at the Jardin des Plantes in Paris.

Incl. *Funium* Willemet (1796). **Type:** *Funium pitiferum* Willemet.

Incl. *Furcroea* De Candolle (1803) (*nom. inval.*, ICN Art. 61.1).

Incl. *Furcroya* Rafinesque (1814) (*nom. inval.*, ICN Art. 61.1).

Incl. *Fourcroya* Sprengel (1817) (*nom. inval.*, ICN Art. 61.1).

Incl. *Fourcroea* Haworth (1819) (*nom. inval.*, ICN Art. 61.1).

Incl. *Codonocrinum* Willdenow *ex* Schultes & Schultes *fil.* (1829). **Type:** *Codonocrinum agavoides* Schultes & Schultes *fil.*

Incl. *Fourcraea* Steudel (1840) (*nom. inval.*, ICN Art. 61.1).

Incl. *Roeslia* Laurentius (1861). **Type:** *Roeslia regia* Laurentius.

Incl. *Roeslia* Baillon (1894) (*nom. inval.*, ICN Art. 61.1).

Plants strictly monocarpic when unbranched or without offsets; stems none or a thick short or to 6 m long trunk; **Ros** with densely crowded leaves; **L** large, erect, coriaceous, lanceolate or linear, long and narrow, thin and flexible or rather thick and stiff, concave or flattened, keeled below, surface smooth or scabrous, rough on the veins below in some taxa, green or glaucous, tip a short mucro or corneous-hardened by the involute leaf

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margins, margins dentate, denticulate, entire or dentate-entire, teeth simple or bicuspidate, sometimes on elevated bases; **Inf** tall lax terminal panicles to 15 m but mostly shorter, peduncle short or up to 3.5 m, bracteate, fertile part pyramidal or rhomboidal to fusiform or oblong, part-**Inf** (= 1.-order branches) on long bracteate branches, with 2.- to 4.-order branches, glabrous or puberulent, often bulbiferous, bulbils conical to ovoid and sometimes with leafy bracts; **Fl** pendulous, bracteate, pedicellate, single or fasciculate in clusters of 2–5, often all or in part replaced by bulbils; **Tep** generally equal but **OTep** narrower and **ITep** with prominent dorsal midrib, ovate to elliptic, (almost) free to the base, greenish- or yellowish-white to white, sometimes with reddish tinge, overlapping marginally, glabrous to puberulent; **Fil** 3 + 3, $\pm \frac{1}{2}$ as long as the tepals and affixed to their bases, dilated below the middle, subulate distally, papillose; **Anth** oblong, 2–8 mm, dorsifixed, centric or sometimes slightly excentric, introrse, versatile; **Ov** inferior, oblong, cylindrical or trigonous, with a short neck at the tip, glabrous or puberulent; **Sty** columnar, basally swollen and triquetrous with 3 basal ridges, papillose; **Sti** small, shortly 3-lobate; **Fr** woody capsules, oblong, subglobose or ovoid, 3-valvate, stipitate, rostrate, opening loculicidally; **Se** \pm deltoid, flattened, often (always?) narrowly to broadly winged, black. — **Cytology**: $2n = 60$ (Whitaker 1934, Satô 1935, Fritsch 1970) (reports of $2n = 44–46$ and $48–50$ by Heitz (1926) are dismissed as doubtful).

The genus has not been completely studied up to the complete revision by García-Mendoza (2001a), which clarified the circumscriptions and taxonomy of many previously uncertain taxa; it is largely followed here with the exception of the taxa that have not yet been formally published. Some of the taxa recognized may, however, merely represent early anthropogenic selections, cultivars or hybrids. With a maximum length of 15 m in *F. cabuya* (García-Mendoza 2001a), the genus apparently has the largest inflorescences of any plant.

Ullrich (1991a) regards the publication of the generic name *Furcraea* as cited above as not effectively published but this was rejected in the

first edition of this handbook, and Ullrich's interpretation is also not accepted by reference works such as García-Mendoza (1998) and Govaerts (2014+).

According to recent molecular and morphological phylogenies, *Furcraea* is sister of *Beschorneria*, and both together are sister of *Agave* in most analyses (Hernández-Sandoval 1995, Bogler & Simpson 1995, Bogler & al. 1995, Bogler & Simpson 1996, Bogler & al. 2006, Rocha & al. 2006, Good-Avila & al. 2006). The two genera exhibit the following putative synapomorphies: Filaments papillose and slightly to distinctly thickened below, ovary basally ribbed and broadened, and pollen shed in tetrads (Álvarez de Zayas & Köhler 1987, Ojeda Revah & Ludlow Wiechers 1995, Hesse & al. 2009). *Beschorneria* differs conspicuously from *Furcraea* in habit and in having soft leaves without teeth, large coloured bracts, connivent tepals, and filaments \pm as long as the tepals.

Furcraea can (possibly artificially) be divided as follows (adapted from García-Mendoza 2001a: 71):

- [1] Sect. *Furcraea* (incl. Sect. *Spinosa* Drummond 1907, *nom. inval.*, ICN Art. 22.2): Stems mostly none or short, to 0.7–1.5 m, or rarely arborescent to 3 (–9) m; **L** margins with conspicuous \pm distant teeth (occasionally teeth few or absent), leaf tip corneous, mucronate; bulbils bracteate or foliose; seedlings with small cotyledons. — Possibly a paraphyletic hold-all.
- [2] Sect. *Serrulatae* Drummond 1907 (incl. subgen. *Roelia* (Laurentius) Baker 1888; incl. ser. *Flexiles* Baker 1879 = subgen. *Flexiles* (Baker) García-Mendoza 2001, *nom. inval.*, ICN Art. 29.1): Plants mostly arborescent and stems conspicuous, 1–9 m; **L** margins closely minutely denticulate, leaf tip corneous; bulbils foliose, with chartaceous outer leaves; seedlings with large cotyledons.

Hochstätter (2016) published 3 infrageneric taxa which each includes species of both sections as recognized above; Hochstätter's names are untypified and invalidly published under ICN Art. 29.1.

Ethnobotany: The leaves of many species are used as source of fibres on local household or industrial scale in major parts of its area, but also outside the Americas esp. in India, Madagascar and Mauritius (García-Mendoza 1998). *Furcraea* species are also planted as hedges and living fences, and to prevent soil erosion. The flowers are eaten and used as religious Easter decoration, the inflorescences as fodder, the leaf juice as soap or to stupefy fishes, to cure gastritis, prostata inflammation, hepatitis, and for liver cleansing and increasing bile secretion (see comments for the individual species). Many species are cultivated as ornamentals worldwide in (sub-) tropical and Mediterranean climates.

For species cultivated in the open mainly in Mediterranean climates or for naturalized species, see Irish & Irish (2000) for the USA, David (2009) for Great Britain, Guillot Ortiz & Meer (2010) for Spain, Wilcox (2005) for New Zealand, and Crouch & Smith (2011) and Smith & Figueiredo (2012) for South Africa.

The following names are of unresolved application but are referred to this genus: *Agave stenophylla* Jacobi (1866); *Agave vivipara* Miller (1768) (*nom. illeg.*, ICN Art. 53.1); *Agave vivipara* Willdenow (1799) (*nom. illeg.*, ICN Art. 53.1); *Agave vivipara* Arruda (1810) (*nom. illeg.*, ICN Art. 53.1); *Furcraea cubensis* Haworth (1819) (*nom. illeg.*, ICN Art. 53.1) \equiv *Agave cubensis* (Haworth) Sprengel (1825) (*nom. illeg.*, ICN Art. 53.1); *Furcraea demouliniana* Jacobi (1867); *Furcraea rigida* Landry ex Jacobi (1867) (*nom. inval.*, ICN Art. 36.1c); *Furcraea roezlii* Eichler (1881); *Furcraea roezlii* var. *atropurpurea* Hort. De Smet (1876); *Furcraea sobolifera* Hort. J. F. Cels ex Jacobi (1867) (*nom. inval.*, ICN Art. 36.1c).

F. acaulis (Kunth) B. Ullrich (Quepo 6: 69, ills., 1992). **Type:** Venezuela (*Bonpland & Humboldt* 633 [†]). — **Lit:** Lott & García-Mendoza (1994: as *F. stratiotes*). **Distr:** N Colombia (César, Guajira, N Santander); N Venezuela (Carabobo, Cumaná, Distrito Federal, Falcón, Lara, Miranda, Sucre, Yaracuy, Zulia); Ecuador (La Loja); chiefly in well-drained limestone soils,

coastal plains, thorn scrub, montane and cloud forests, 0–1330 m; flowers July to September. **I:** Hoyos (1982: as *F. humboldtiana*).

\equiv *Yucca acaulis* Kunth (1816); **incl.** *Codonocrinum agavoides* Willdenow ex Schultes & Schultes fil. (1829); **incl.** *Furcraea altissima* Todaro (1889); **incl.** *Furcraea humboldtiana* Trelease (1910); **incl.** *Furcraea stratiotes* J. B. Petersen (1922).

[1] Stems simple, arborescent to subcaulescent, to 1–3.5 m, dry leaves persisting; **Ros** 3.5 m \varnothing ; **L** 70–100, at first erect, later spreading, lanceolate to broadly lanceolate, coriaceous, at the base 3.5–5 (–9.5) cm broad and 4 cm thick, plane-concave in cross-section, almost flat, concave towards the apex, acute, rough below, smooth above, or also rough on the lower part of the upper face (Dewey 1943), (1–) 1.2–1.75 (–2) m \times (9–) 11–18 (–20) cm (in the middle), glaucous or yellowish-green to dark green or greyish, margins dentate, sometimes corneous-dentate to the base; **marginal teeth** geminate or doubly geminate, reflexed in opposite directions near the leaf base, further up sometimes single and upcurved, intervening margin concave, or rarely teeth nearly all simple and mostly upcurved and intervening margin nearly straight, teeth strong, 3–10 mm, 4–6 (–7) mm broad at the base, reddish to orange, becoming garnet-red with darkened tips, or at last dark chestnut-brown, on broadly deltoid or semi-circular herbaceous decurrent bases, or sometimes decurrent along the intervening margin, (1.5–) 2–4.5 (–6 (–8)) cm apart at mid-leaf, 1–3 cm at the base; **terminal Sp** acute, partially involute, mucronate, small, robust, channelled below, 3–7 (–10) \times 2 mm, dark reddish to garnet-red or chestnut-brown, slightly decurrent; **Inf** 7–9 (–12) m, peduncle 5–6 m, green, with short bracts, fertile part in the upper $\frac{1}{2}$ or $\frac{1}{3}$, with ± 40 part-**Inf**, 40–70 (–100) cm, glabrous, with 20–30 2.-order branches, 5–17 cm, green, glabrous or pilose, bulbiferous, bulbils conical, 23–30 \times 7–8 mm, bracteate, green, covered with 2 scarious bracts; **Ped** 3–5 mm, glabrous; **Fl** 37–40 mm, geminate; **Te** 20–23 mm, \pm obtuse, yellowish-green to light yellow, with white margins, glabrous; **OTep** narrowly elliptic, (4–) 5–7 mm broad; **ITep** elliptic, (6–) 8–10 mm broad; **Fil** subulate, 12–14 mm,

1–2 mm wide at the broadened base; **Anth** oblong, 2 mm, yellow; **Ov** cylindrical, triquetrous, 17–20 × 3–4 mm; **Sty** triquetrous, (15–) 18–20 mm, 2–3 mm wide at the broadened base; **Sti** trifid; **Fr** subsphaerical, 35–40 × 30–40 mm, stipitate for 10 mm; **Se** winged for 2–3 mm, 13–15 × 8–9 mm, shiny.

Insufficiently known before the first full description was published by García-Mendoza (2001a). The type collection does not seem to be extant (Stauffer & al. 2012).

After Trelease (1915a) wrongly listed the much older *Yucca acaulis* in the synonymy of his *F. humboldtiana*, Ullrich (1992) was the first to notice the error, which he rectified by publishing the necessary new combination.

First collected by Bonpland and Humboldt in Venezuela where the species is native. The distribution in Colombia appears to be natural, and several fragmentary specimens from Grenada, the Virgin Islands and Trinidad may belong here (García-Mendoza 2001a). Spineless plants placed here by Hoyos (1982) appear to belong to *F. foetida*. *F. stratiotes* (described from material collected in Nicaragua in 1848 that flowered in cultivation in Copenhagen in 1921; never recollected in Nicaragua and the only known occurrence is in the Virgin Islands according to Proctor & Acevedo-Rodríguez 2005) differs in having smaller flowers and compressed bulbils.

Olivares & Medina (1984) argue that the flowers are sterile and that the plants propagate only through bulbils, but the description of fruits and seeds by García-Mendoza (2001a) shows that this is not universally true.

F. acaulis is widely cultivated in Venezuela for fibre (Dewey 1943), and Giraldo & al. (2009) report that the leaves are used against various illnesses.

F. antillana A. Álvarez (Anales Inst. Biol. UNAM, Ser. Bot. 67(2): 331–335, ill., 1996). **Type:** Cuba, La Habana (Álvarez 63654 [HJJB, MEXU]). — **Lit:** Proctor & Acevedo-Rodríguez (2005). **Distr:** Greater Antilles: Cuba, Hispaniola, Puerto Rico (cultivated); mainly semideciduous forests or dry coastal scrub or thornscrub, also in pine forests and secondary formations, on

limestone or serpentine, 0–200 m; flowers July to September. **I:** García-Mendoza (2001a).

[1] Stems none or short, to 0.5 m, not rhizomatous; **L** 90–110, erect, straight, coriaceous, narrowly lanceolate or narrowly elliptic, base narrowed to 2–3 cm, nearly flat to slightly canaliculate, long-acuminate, slightly folded towards the tip, rigidly coriaceous, often asperous on both faces, (0.6–) 0.9–1.2 (–2) m × (3–) 5–8 (–10) cm, light green to somewhat yellowish, opaque, margins straight between the teeth; **marginal teeth** triangular, straight or normally somewhat upcurved, 1.5–5 (–7) mm, 1–3 mm broad at the base, chestnut-brown to nearly black, on small deltoid bases, decurrent, 0.8–2 (–5) cm (0.4–1 (–1.5) cm at the leaf base) apart, lacking in the upper $\frac{1}{3}$ – $\frac{1}{4}$ of the leaf, **L** tip acute, not or inconspicuously mucronate for 1 mm; **Inf** 4–6 (–8) m, peduncle 3–4 m, glabrous, green, with triangular green **Bra** 20–30 cm long, fertile part narrowly fusiform, part-**Inf** 50–80, (20–) 40–70 (–120) cm, glabrous or pilose, ascending, in the upper $\frac{1}{2}$ – $\frac{2}{3}$ of the inflorescence, with 5–10 2.-order branches 10–25 (–30) cm long, rarely with 3.-order branches to 5 cm long, bulbiferous, bulbils conical, narrowly fusiform, bracteate to somewhat leafy, with leaves to 25–35 (–50) × 5–8 (–12) mm; **Ped** 2–6 (–10) mm; **Fl** single or 2–3 grouped together, campanulate, (25–) 32–40 (–47) mm; **Tep** elliptic, (12–) 14–20 (–27) mm, glabrous, whitish-green; **OTep** 3–7 mm broad; **ITep** 5–10 mm broad; **Fil** 8–12 (–20) mm, 1.5–2 mm broad at the base; **Anth** oblong, 2–4 mm, yellowish; **Ov** cylindrical, triquetrous, (13–) 18–20 × 3–4 mm; **Sty** (10–) 12–15 (–20) mm, 4–5 mm wide at the broadened base; **Sti** 3-lobate; **Fr** oblong, (25–) 30–35 (–50) × (16–) 25–30 mm, rostrate, base constricted, stipitate for 10 mm; **Se** winged for 1–2 mm, (8–) 9–11 (–12) × 5–7 (–9) mm, shiny.

Often confused with *F. hexapetala* and similar to the Mexican *F. cahum*, but differing from the latter in being smaller in all parts, including more and shorter leaves with smaller and fewer marginal spines, as well as glabrous inflorescence branches and flowers (Álvarez de Zayas 1996, García-Mendoza 2001a). Variable in leaf and flower characters, caused mainly by different

edaphic conditions. Reproduction is mainly asexual by bulbils (Álvarez de Zayas 1996).

F. boliviensis Ravenna (Pl. Life (Stanford) 34: 151–153, ill., 1978). **Type:** Bolivia, Cochabamba (*Ravenna* 2305 [Herb. Ravenna]). — **Lit:** Ullrich (1992). **Distr:** W & C Bolivia (Cochabamba, La Paz, Santa Cruz); infrequent on open rocky slopes in arid woodland, xeromorphic forests, and anthropogenic savannas, in partial shade, 1100–3500 m; flowers March to June.

[1] Stems short, stout, sometimes prostrate, 30–40 × 10–15 cm; **Ros** 0.9–1 (incl. stem) × 1–1.4 m; **L** numerous, linear-lanceolate, erect, often spreading, thick, rigid, narrowed near the base to 3.5–5.5 cm, moderately channelled, smooth, (45–) 60–95 × 8–9 (–11) cm, opaquely ash-green, margins dentate throughout; **marginal teeth** small, simple, uncinat, upcurved, fragile, 2–4 mm, 1–3 mm broad at the base, reddish, on small deltoid bases, 1.5–2 (–2.5) cm apart, near the base 1 cm; **terminal Sp** none, with weak, acute, reddish mucro 1–1.5 mm long; **Inf** 4–7.5 m, peduncle pale green to yellowish-green, velutinous, fertile part with velutinous part-**Inf** 30–40 cm long, with 1–3 green, velutinous 2.-order branches 10–15 cm long, bulbilliferous, bulbils conical, leafy, (20–) 40–50 × (8–) 12–18 mm, with 4–6 dentate small leaves; **Ped** 3–7 mm, velutinous; **Fl** single or geminate, 45–55 mm; **Tep** 25–30 mm, velutinous, whitish-green; **OTep** narrowly elliptic, 7–8 mm broad; **ITep** elliptic, 9–11 mm broad; **Fil** 13–14 mm, 3–4 mm wide at the broadened base; **Anth** oblong, 4 mm, yellow; **Ov** 20–25 × 3–5 mm; **Sty** 18 mm, 4 mm wide at the broadened base; **Fr** and **Se** unknown.

For long known from the sterile type specimen only, but meanwhile documented by further collections. The first complete description was provided by García-Mendoza (2001a). The species is characterized by leaves with small teeth, and velutinous peduncles, inflorescence branches and flowers, and leafy bulbils with dentate small leaves.

According to the protologue related to the Mexican *F. pubescens* and the Peruvian *F. andina* (here treated as synonym of *F. hexapetala*). Apart from *F. occidentalis* (with much smaller teeth)

F. boliviensis is the only native Bolivian species. Pino (2006) speculates that the species might also occur on the Peruvian altiplano.

F. cabuya Trelease (Ann. Jard. Bot. Buitenzorg 3(Suppl. 2): 906, tt. 36–37, 1910). **Type:** Costa Rica (*Worthen & Dewey* s.n. [MO]). — **Lit:** Lott & García-Mendoza (1994: online version with ills.); García-Mendoza (1998); Robbins (2001: online version with ills.). **Distr:** Honduras, W Nicaragua, Costa Rica, Panama; cultivated or naturalized in Mexico (Yucatán), Colombia and Venezuela; disturbed thorn forests, savannas and pine forests, (50–) 300–1800 m; flowers July to October.

[1] Stems none or to 0.5 (–1) m, covered with old leaves; **Ros** 2–3.5 m Ø; **L** 40, lanceolate, erect, coriaceous, semisucculent, abruptly narrowed above the base to ±5–8 cm, 4–6 cm thick at the base, openly concave, long acuminate, rough below, smooth above, (1–) 1.5–2 (–3) m × (10–) 15–20 (–22) cm, green, glaucous when young, above slightly glossy and rather pale-lined, margins often subrevolute, crenate, nearly straight between the teeth, sometimes with a corneous band from mid-leaf towards the base, **marginal teeth** deltoid, strong, upcurved, straight or recurved, 5–8 (–11) mm, 3–5 mm broad at the base, reddish chestnut-brown to blackish, decurrent on distinct deltoid herbaceous bases nearly 10 mm wide, (2.5–) 3–5 (–6) cm apart (2–4 cm near the leaf base), along the whole margin; **terminal Sp** conical, minute, 1–3 (–5) × 1–1.3 mm, chestnut- or dark brown; **Inf** 4–8 (–10 (–15)) m, peduncle much shorter than the fertile part, glabrous, green, with triangular or rhomboidal **Bra** 20–50 (–70) cm long, fertile part open, with part-**Inf** 45–70 (–100) cm long, with 8–13 2.-order branches (4–) 10–25 cm long, both glabrous or puberulent, rarely with 3.-order branches <2.5 cm long, sometimes bulbilliferous, bulbils ovoid to ovoid-conical, (20–) 60 × (15–) 50 mm, with 2–3 scarios green bracts; floral **Bra** 2–3 mm, puberulent; **Ped** glabrous, 3–7 (–12) mm, glabrous or pilose; **Fl** (37–) 40–55 (–62) mm, single or 2–3 (–6) grouped together; **Tep** (20–) 25–30 (–35) mm, whitish- to yellowish-green to white, glabrous, overlapping parts papillose; **OTep**

narrowly elliptic, 7–10 (–15) mm broad; **ITep** elliptic, 10–15 (–18) mm broad; **Fil** 11–16 mm, 1.5–3 mm wide at the broadened base; **Anth** oblong, 3–4.5 mm, yellowish; **Ov** cylindrical, 20–25 (–30) × 3–5 mm, glabrous, with a neck 9–10 mm long; **Sty** 15–22 mm, 4–5 mm wide at the broadened base; **Sti** papillose, 3-lobate; **Fr** oblong, shortly stipitate, 55–60 (–75) × (35–) 40–45 mm; **Se** winged for 3 mm, 15–17 × 9–10 mm, shiny.

Characterized by (20–) 30–50 widely separated teeth along the whole leaf margin, and flowers with an ovary 3–10 mm shorter than the tepal lobes. Similar to *F. hexapetala* in leaf size, the number of the widely separated teeth, and the diffusely branched inflorescence, but differing in its larger flowers, fruits and seeds (García-Mendoza 2001a). *F. cabuya* var. *integra* is placed in the synonymy of *F. foetida*.

The widely cultivated plant and its fibre are called “cabuya”, “cabuía”, or “cabulla”. Propagation is especially by rhizomatous offsets, and also by bulbils. In Costa Rica, the fibres were used to make twines, ropes, saddlebags, cinches, halters, and hammocks, often as household industry (Dewey 1943). Its inflorescence is the largest of any flowering plant.

F. cahum Trelease (Ann. Jard. Bot. Buitenzorg 3(Suppl. 2): 908, t. 39, 1910). **Type** [lecto]: Mexico, Yucatán (*Schott* 809 [F, BM, ILT, MO, US]). — **Lit**: Lott & García-Mendoza (1994: online version with ills.); García-Mendoza (1998). **Distr**: Mexico (Yucatán peninsula: Campeche, Quintana Róo, Yucatán); tropical semideciduous forests, to 150 m.

[1] Stems none or short, to 0.5 (–1) m; **Ros** 2–4 m Ø; **L** 60–80, erect, linear-lanceolate, coriaceous, narrowed to 2.5–3.5 cm above the base and 1.5–2.5 cm thick, long acuminate, flat below, concave, keeled, with prominent venation, smooth, (1.3–) 1.6–2.2 (–2.5) m × (5–) 6–10 (–11.5) cm, bright to brilliant green, margins ± straight between the teeth, dentate to dentate-corneous below, yellowish to dark reddish; **marginal teeth** rather strong, upcurved or straight, rarely geminate, 2–4 (–5) mm, 2–3 (–4) mm wide at the base, reddish, brown or dark brown to black,

decurent on small deltoid bases, 1.5–3 (–4 (–6)) cm apart at mid-leaf, 0.5–1 (–2) cm near the base, absent for the upper ¼ – ½; **terminal Sp** conical, corneous, acute, 1.5–6 × 1.5–2.5 mm, blackish chestnut-brown or reddish; **Inf** (4–) 5–8 (–11) m, peduncle to (3.5–) 5–8 m, green, glabrous, with long triangular, green, puberulent to pilose **Bra** 30–65 cm long, fertile part oblong, in the upper ¼ – ½, with 40–50 part-**Inf** 50–80 cm long, with 5–8 2.-order branches 5–30 cm long, lower rarely with 3.-order branches to 12 cm long, all puberulent to pilose, freely bulbiferous, bulbils bracteate to somewhat foliose, conical, (15–) 20–28 (–40) × 4–8 (–13) mm, with (2–) 3 deltoid green bracts, small leaves 1–3 cm; floral **Bra** deltoid, 3 mm, puberulent, brown; **Ped** 4–6 (–10) mm, puberulent; **FI** (35–) 40–45 (–52) mm, single or 2–3 (–4) grouped together, minutely papillose-puberulent; **Tep** 17–20 (–25) mm; **OTep** lanceolate-elliptic, (3–) 7–9 mm broad, glabrescent to glabrous; **ITep** elliptic, (4–) 8–12 mm broad, pilose to glabrescent on the midrib, papillose in the area of overlap, yellowish-green on the outer face, whitish within; **Fil** 10–14 mm, 2.5–4 mm wide at the broadened base, somewhat papillose; **Anth** oblong, centric, sagittate, 3.5–3.7 mm, yellow; **Ov** cylindrical, 20–27 × 3–6 mm, puberulent, neck 5–10 mm; **Sty** 14–19 mm, 7–8 mm wide at the broadened base, 3-sulcate, somewhat papillose; **Sti** 3-lobate; **Fr** oblong, stipitate for 10–13 mm, beaked for 5–8 mm, pilose, (35–) 40–50 × (25–) 30–35 mm; **Se** broadly winged for 2–4 mm, 9–12 (–13) × 5–8 mm, shiny.

The species (vernacular names: “cahum”, “cajum”, “cahun” and “cajum-ci”) was widely cultivated for fibre, but has now apparently been abandoned (García-Mendoza 2001a). It is characterized by large, linear-lanceolate leaves, small and closely spaced teeth absent in the upper ¼ or ½ of the leaves, oblong inflorescences with long peduncles occupying ⅔ of its length, and flowers which are puberulent when young, becoming glabrescent when maturing (García-Mendoza 1998, García-Mendoza 2001a).

F. depauperata Jacobi (Hamburg. Gart.- & Blumenzeit. 22: 411, 1866). **Type**: not typified. — **Distr**: Cultivated only.

Incl. *Furcraea macra* Hort. Parmentier ex Jacobi (1866) (*nom. inval.*, ICN Art. 36.1, 38.1).

[1] Stems none; **L** 15–20, lanceolate, apparently ascending, thin, coriaceous, moderately firm, 33–46 × 5–5.7 cm, dull green, much narrowed towards the base and there ±1.3 cm broad, narrowed towards the apex into a terete, fleshy tip later drying off, both faces smooth or also scabrous, lower ½ longitudinally grooved and below angularly arched and roundly keeled, towards the apex slightly arched, with several keels, with imprints of the next older leaves, margins wavy curved in the lower part, straight in the upper part, continuous, very thin and somewhat remotely toothed; **marginal teeth** small, on deltoid cartilaginous whitish-green bases, with chestnut-brown upcurved tip, 1–1.5 cm apart; **Inf** with peduncle 0.9–1.5 m, smooth, fertile part rhomboid, with spreading, somewhat flattened, 10 cm long part-**Inf**, bulbiferous; **Ped** short, articulated; **Fl** (25–) 30–35 × 32 mm, single; **OTep** lanceolate, 35 × 9–10 mm, tip nearly cucullate and with a tuft of white hairs within, finely puberulent on both faces, whitish-green; **ITep** ovate-elliptic, 38 × 12–16 mm, finely puberulent on both faces, light green turning whitish towards the margins; **Fil** 15–18 mm, 4 mm wide at the broadened base; **Ov** cylindrical, inconspicuously trigonous, with 6 flat furrows, 25 mm, whitish-puberulent, pale green; **Fr** and **Se** unknown.

This long-forgotten name was re-established by Govaerts (2014+), while García-Mendoza (2001a) lists it among the insufficiently known species. Jacobi obtained his material from the Belgian nurseryman Bedinghaus as *F. tuberosa* and noted that it was cultivated in gardens under the unpublished name *F. macra*. *F. depauperata* is only known from its protologue but appears well characterized, and cannot be reliably equated with any other presently known species. It might, however, represent a depauperate pot-cultivated *F. undulata* which likewise has wavy leaf margins and pubescent tepals and ovaries. Depauperate cultivated *F. undulata* are indeed similar in their dimensions (Baker 1892: as *F. pubescens*).

F. foetida (Linné) Haworth (Synops. Pl. Succ., 73, 1812). **Type:** [lecto — icono]: Commelin,

Hort. Med. Amstelod. Pl. Rar. 2: 35, t. 18, 1701. — **Lit:** Verhoek & Hess (2002); Guillot Ortiz & Meer (2010); Crouch & Smith (2011); all with ills. **Distr:** USA (Florida), Mexico (Yucatán), C America (Costa Rica, Panama?), Greater and Lesser Antilles, Trinidad, N South America (Colombia, Venezuela, Bolivia, French Guiana, Guyana, Suriname, Brazil); cultivated or naturalized; widely cultivated and naturalized in Africa, Asia and the Pacific and Indian Ocean Islands, to 2000 m; flowers any time but mainly July to September. **I:** Curtis's Bot. Mag. 48: t. 2250, 1821, as *F. gigantea*; Curtis's Bot. Mag. 107: t. 6543, 1881, as *F. cubensis* var. *inermis*; Trelease (1910: tt. 35, 46–48); Irish & Irish (2000: tt. 61–62); Wilcox (2005).

≡ *Agave foetida* Linné (1753) ≡ *Aloe foetida* (Linné) Crantz (1766); **incl.** *Agave foetida* Aublet (1775) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Agave foetida* Lamarck (1784) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Furcraea gigantea* Ventenat (1793) ≡ *Agave gigantea* (Ventenat) D. Dietrich (1840) (*nom. illeg.*, ICN Art. 53.1) ≡ *Furcroya gigantea* (Ventenat) Hooker (1860); **incl.** *Funium pitiferum* Willemet (1796); **incl.** *Furcraea madagascariensis* Haworth (1819) ≡ *Agave madagascariensis* (Haworth) Salm-Dyck (1822); **incl.** *Furcraea tuberosa* Hasskarl (1856) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Furcraea tuberosa* Hort. Belg. (1860) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Furcraea atroviridis* Jacobi & Goeppert (1866); **incl.** *Furcraea barillettii* Jacobi (1869); **incl.** *Agave bulbosa* W. Bull (1871); **incl.** *Agave bulbosa* K. Koch (1871) (*incorrect name*, ICN Art. 6.3); **incl.** *Furcraea cubensis* var. *inermis* Baker (1881); **incl.** *Furcraea viridis* Hemsley (1884) (*nom. inval.*, ICN Art. 61.1); **incl.** *Furcraea watsoniana* Hort. Sander (1898) ≡ *Furcraea gigantea* var. *watsoniana* (Hort. Sander) Drummond (1907) (*nom. inval.*, ICN Art. 11.4); **incl.** *Furcraea altissima* Franceschi & al. (1900) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Furcraea cabuya* var. *integra* Trelease (1910); **incl.** *Furcraea gigantea* [?] *mediopicta* Trelease (1910); **incl.** *Furcraea gigantea* [?] *variegata* hort. ex Trelease (1910); **incl.** *Furcraea gigantea* var. *mediopicta* Trelease (1915); **incl.** *Furcraea variegata* hort. ex Trelease (1915); **incl.** *Furcraea foetida* 'Mediopicta'

Trelease *ex* L. H. Bailey & E. Z. Bailey (1976); **incl.** *Furcraea foetida* ‘Striata’ Piens (1996).

[1] Stems none or short, to 0.5–1 m × 20–30 cm; **Ros** 2.5–3.5 m Ø; **L** to 50 cm (75–150 cm in aged plants), broadly lanceolate or linear-lanceolate to oblanceolate, erect, outermost sometimes recurving, thick, rigid, firm, narrowing distinctly in the lower ½ to about 10 cm near the base, ± flat, keeled, concave towards the base, at the base (4–) 6–10 cm broad, smooth or obsolescently striate, 1.5–2 (–2.5) m × (9–) 14–21 (–25) cm, shiny to verdant green to yellow-green, apex channelled dorsally, hardened, flattened and folded, sometimes corneous, conical, 1–2 (–3) mm, reddish, margins hard, smooth, usually entire at least in the distal ½, straight or somewhat wavy, sometimes basally with 4–7 trigonous upcurved teeth 1–3 mm long, otherwise unarmed; **Inf** (4–) 8–10 (–12) m, peduncle 1–1.5 m, green, glabrous, with rhomboidal **Bra** 30–40 cm long, fertile part ± rhomboidal to broadly pyramidal, rather narrow, lax, occupying most of the inflorescence, with 40–60 part-**Inf** 1–2 m long, the lower richly branched, glabrous, with 4–13 2.-order branches 15–30 cm long, glabrous or somewhat pilose, scarcely to freely bulbiferous, bulbils foliose, ovoid, sometimes conical, 25–30 (–45) × 5–10 (–15) mm, with 3–5 papyraceous or chartaceous bracts and 3–4 (–5) small leaves; **Ped** 3–7 (–12) mm, glabrous; **Fl** (35–) 40–45 (–50 (–57)) mm, single or 2–3 (–5) grouped together, scented; **Tep** 20–25 (–30) mm, glabrous, whitish-green, yellowish-green, or pale blue-green; **OTep** narrowly elliptic, 5–10 mm broad; **ITep** broadly elliptic, (8–) 10–15 mm broad; **Fil** 11–14 mm, 2–4 mm wide at the broadened base; **Anth** oblong, 2–3 mm; **Ov** cylindrical, glabrous, (12–) 15–25 (–30) × 2–3 (–5) mm; **Sty** 15–16 mm, 2–4 mm wide at the broadened base, 3-lobed up to the middle; **Sti** 3-lobed; **Fr** and **Se** not described (but “infrequently produced” according to Crouch & Smith 2011); **Se** “usually not formed” (l.c.). — **Cytology**: 2n = 60 (Whitaker 1934, Satô 1935: as *F. gigantea*).

Cultivated worldwide in (sub-) tropical regions for fibre (Dewey 1943) and often naturalized. Vernacular names: “cañamo” (Bolivia), “piteira”

(Brazil), “cabuya cimarrona” (Colombia), “cabuya blanca”, “cabuya olancho”, “cabuya sin espinas”, “cabulla” (Costa Rica), “cocuiza”, “cocuiza mansa” (Venezuela) (García-Mendoza 2001a). Characterized by solid green, slightly glossy leaves with a smooth, unarmed and often wavy margin, and a soft tip. It differs from *F. selloana* in its smooth leaves with margins unarmed or only armed up to mid-leaf. According to Lott & García-Mendoza (1994) not reliably known from Mesoamerica, but García-Mendoza (2001a) later cited specimens from the Mesoamerican countries as given above.

The synonym *F. viridis* is a spelling error for *F. atroviridis*. *F. cubensis* var. *inermis* and *F. cabuya* var. *integra* refer to variants with (nearly) completely toothless leaf margins placed here by García-Mendoza (2001a). *Furcraea* ‘Castilla’, a cultivar with toothless leaf margins cultivated in Colombia esp. around Antioquia (Pérez Mejía 1974), likewise appears to belong here. *F. watsoniana*, *F. variegata*, ‘Mediopicta’, and ‘Striata’ are variegated forms grown as ornamentals.

F. nana (Hochstätter 2016) is an invalidly published species that appears closely related to *F. foetida*, differing by smaller size and entire leaf margins.

F. geminispina Jacobi (Hamburg. Gart.- & Blumenzeit. 22: 358–359, 1866). **Type**: not typified. — **Lit**: Álvarez de Zayas (1996: with ill., as *F. tuberosa*). **Dist**: Bahamas (Acklins, Cat Island, Inagua), Turks and Caicos Islands (South Caicos), Cuba (Camagüey, Holguín, Guantánamo), C & N Haiti, Dominican Republic (?); frequent in secondary habitats near roads or settlements, 700–900 m (Cuba); flowers July to September.

≡ *Furcraea tuberosa* var. *geminispina* (Jacobi) Trelease (1927); **incl.** *Agave tuberosa* var. *β spinis duplicibus* Aiton (1789) (*nom. inval.*, ICN Art. 23.1).

[1] Stems none or short, to 0.3 m; **L** up to 60, lanceolate, erect, subcoriaceous, moderately flat, 2.5 cm broad at the base, scabrous below, smooth above, 1–1.6 (–1.8) m × (7–) 10–15 (–17) cm, shiny green, margins straight, dentate, sometimes corneous towards the base; **marginal teeth** simple, upcurved, 5–10 of them geminate, uncinat,

large, strong, 5–8 (–10) mm, 3–5 (–7) mm broad at the base, on small bases, 3.5–6 cm apart, reddish, **L** tip an acute mucro 2–5 mm long, chestnut-brown; **Inf** 5–7 m, peduncle short, green, **Bra** unknown, fertile part fusiform, lax, in the upper $\frac{3}{4}$ of the inflorescence, part-**Inf** 30, 50–80 cm, with 2–4 2.-order branches (6–) 15–30 cm long, both pilose, green, bulbiferous, bulbils ovoid, bracteate or rarely foliose, 20–30 (–45) \times 10–15 (–20) mm, with 2–3 scarious green bracts; **Ped** 5–10 mm, somewhat pilose; **Fl** 45–55 (–60) mm, single or 2 grouped together; **Tep** 25–30 (–33) mm, glabrous, whitish-greenish; **OTep** narrowly elliptic, (6–) 8–10 mm; **ITep** (9–) 11–13 mm; **Fil** 11–13 mm, 1.5–2 mm wide at the broadened base; **Anth** oblong, 2.5–3 mm, yellow; **Ov** cylindrical, 20–25 \times 3–4 mm; **Sty** 16–18 mm, 4–5 mm wide at the broadened base; **Fr** and **Se** unknown.

The first edition of this handbook and many authors placed this name in the synonymy of *F. tuberosa* (Drummond 1907, Álvarez de Zayas 1996, Smith & Figueiredo 2012), or *F. acaulis* (Dewey 1943, Pérez Mejía 1974, Ullrich 1992), while García-Mendoza (2001a) choose to re-establish the taxon as separate species for Caribbean material with geminate leaf margin teeth (as opposed to *F. tuberosa* with single teeth). *F. geminispina* is similar to *F. hexapetala* in size and armature of the leaves as well as the size of flowers and bulbils.

F. guatemalensis Trelease (Trans. Acad. Sci. St. Louis 23(3): 149, t. 32, 1915b). **Type:** Guatemala (Trelease 23 [ILL]). — **Lit:** Trelease (1915b: t. 35, as *F. melanodonta*); Standley & Steyermark (1952: with ill., as *F. melanodonta*); Lott & García-Mendoza (1994: online version with ill.); García-Mendoza (1998). **Dist:** Guatemala (Alta Verapaz, Baja Verapaz, Guatemala, El Progreso, Quetzaltenango, Sololá), Honduras (Comayagua, El Paraíso, Intibucá, Morazán), Nicaragua, El Salvador (Ahuachapán, Santa Ana, San Salvador, San Vicente); open hillsides, dry rocky hills and slopes, in ecotones of pine-oak forests to tropical deciduous forests, commonly planted in hedges or fence rows, 700–2750 m; flowers late June to August. **I:** Meer (2014a).

Incl. *Furcraea melanodonta* Trelease (1915).

[1] Stems short, 0.7–1.2 \times 0.3–0.6 m, simple; **Ros** 2–3 m \varnothing ; **L** 60–100, lanceolate, erect, coriaceous, narrowed at the base to 6.5–8.5 cm, base 5–10 cm thick, tip acute, moderately concave, keeled, rough below, mostly smooth or occasionally rough above, (1.5–) 2–2.5 m \times 15–20 (–25) cm, dark green, margins dentate, crenate, sometimes forming a corneous band towards the base; **marginal teeth** simple, upcurved or straight, strong, (4–) 6–10 mm, 3–6 mm broad at the base, chestnut-brown, dark reddish or blackish, 1.5–3 (–5) cm apart (1–2 (–4) cm low down), uppermost 10–30 cm toothless, decurrent on deltoid bases; **terminal Sp** conical, mucronate, 0.5–1 (–4) mm, chestnut-brown; **Inf** 5–8 m, peduncle 1–2 m, green, glabrous, with narrowly triangular, toothed, mucronate, green **Bra** 40–80 cm long, fertile part dense, pyramidal to rhomboidal, glabrous, in the upper $\frac{3}{4}$ of the inflorescence, part-**Inf** 40–90, 1.5–2 m, 2.-order branches (15–) 20–40 (–60) cm, sometimes with 3.-order branches 3–19 cm long, all with rapidly deciduous bracts, bulbiferous, bulbils broadly ovate, 25–30 \times 20–25 (–30) mm, green, covered with 3–5 bracts; fertile **Bra** much shorter than the pedicels; **Ped** 4–10 mm, glabrous; **Fl** (40–) 45–50 (–55) mm, single or 2–3 grouped together; **Tep** elliptic, yellowish-green with whitish margins, glabrous; **OTep** 22–25 (–30) \times 6–9 (–12) mm; **ITep** 24–30 (–35) \times 10–15 (–20) mm; **Fil** 10–15 mm, 3–4 mm wide at the broadened base, papillose, yellowish; **Anth** oblong, base sagittate, 2–4 mm, yellow; **Ov** cylindrical, 20–25 \times 3–5 mm, greenish, glabrous, neck not mentioned; **Sty** 17–20 mm, 4–6 mm wide at the broadened base, 3-sulcate; **Sti** papillose, 3-lobate; **Fr** pear-shaped, stipitate for 12–15 mm, beaked, (40–) 50–70 \times 35–50 mm; **Se** winged for 4–6 mm, 16–18 \times 8–10 mm, shiny.

The species is characterized by its stems <1.2 m high, its large leaves which are rough below, its large, massive, dense, glabrous inflorescences with glabrous flowers and broadly ovate bulbils (García-Mendoza 1998, García-Mendoza 2001a). Vernacular names: “ikaj”, “kaq ik’e”, “maguey rojo”, “maguey”, “churr”, “pita”, or “kima” (Guatemala), “maguey” or “magueyón

macho" (El Salvador), "maguey" (Honduras) (García-Mendoza 2001a). More widely used in the past when it was planted as hedges for harvesting fibres for making ropes and backpacks. Currently, plants survive near houses where they are used apparently at low levels.

Standley & Steyermark (1952) expressed doubts whether *F. melanodonta* can be separated from *F. guatemalensis*, and Lott & García-Mendoza (1994) and subsequent authors treat the name as a straightforward synonym. Material from Mexico (Chiapas) is no longer thought to belong here by García-Mendoza (2001a) but was tentatively assigned to 2 species new to describe.

F. hexapetala (Jacquin) Urban (Symb. Antill., 4: 152, 1903). **Type** [neo]: Cuba, La Habana (Jacquin s.n. [BM]). — **Lit**: Britton & Millspaugh (1920: as *F. macrophylla*); Correll & Correll (1982: with ills., as *F. macrophylla*); Álvarez de Zayas (1996: with ills.); Proctor (2012). **Distr**: Bermuda, Bahamas, W Cuba (Cienfuegos, Ciudad Habana, Habana, Matanzas, Pinar del Río), Jamaica, Cayman Islands, Peru; on Cuba in semi-deciduous forests and xeromorphic scrub on serpentine, esp. abundant at anthropogenic sites, to 750 (–1250) m; flowers any time of the year but mainly August to January. **I**: Hooker's Icon. Pl. 26: t. 2501, 1899, as *F. macrophylla*; Trelease (1910: t. 37, as *F. macrophylla*; t. 41, as *F. cubensis*); Curtis's Bot. Mag. 138: t. 8461, 1912, as *F. elegans*.

≡ *Agave hexapetala* Jacquin (1760); **incl.** *Agave aspera* Jacquin (1762) ≡ *Furcraea aspera* (Jacquin) M. Roemer (1847); **incl.** *Agave cubensis* Jacquin (1763) ≡ *Furcraea cubensis* (Jacquin) Ventenat (1793) ≡ *Furcroya cubensis* (Jacquin) Ventenat (1796) (*incorrect name*, ICN Art. 11.4); **incl.** *Agave odorata* Persoon (1805); **incl.** *Furcraea agavephylla* Brotero ex Schultes (1829); **incl.** *Furcraea valleculeata* Jacobi (1867); **incl.** *Furcraea elegans* Todaro (1876); **incl.** *Furcraea ghiesbreghtii* Hort. Verschaffelt ex Todaro (1876) (*nom. inval.*, ICN Art. 36.1c); **incl.** *Furcraea pugioniformis* Hort. Verschaffelt ex Todaro (1876) (*nom. inval.*, ICN Art. 36.1c); **incl.** *Furcraea macrophylla* Baker (1899); **incl.** *Furcraea deledevantii* Rivière (1902); **incl.**

Furcraea deledevantii Rivière (1902) (*nom. inval.*, ICN Art. 61.1); **incl.** *Furcraea altissima* Todaro ex Borzi (1909) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Furcraea andina* Trelease (1915); **incl.** *Furcraea altissima* hort. ex Trelease (1915) (*nom. illeg.*, ICN Art. 53.1).

[1] Stems none or short, to 0.5 m; **L** 60–80, lanceolate, erect, straight, coriaceous, gradually narrowed to 2–7 cm above the broadened base, flat or slightly canaliculate, slightly scabrous below, smooth above, 1–1.6 (–2) m × (5.5–) 8–12 (–20) cm, bright green, lustrous, margins dentate, crenate, sometimes corneous towards the base; **marginal teeth** simple, straight or upcurved, sometimes with some recurved smaller teeth near the base, 5–8 (–11) mm, (3–) 4–7 mm broad at the base, decurrent on small deltoid bases, 3–6 (–10) cm apart, blackish to reddish, **terminal Sp** canaliculate, acute, mucronate, 2–3 mm, sometimes lacking, chestnut-brown; **Inf** 6–8 m, peduncle 1–1.5 (–2) m, glabrous, green, with triangular, green **Bra** 15 cm long, fertile part rhomboidal, diffusely branched, open, in the upper $\frac{3}{4}$ to nearly the whole inflorescence, with 30–40 part-**Inf** (0.5–) 1–1.5 (–2) m long, pilose or glabrous, with 3–9 (–15) 2.-order branches 10–40 cm long, pilose, green, rarely with 3.-order branches <1 cm long, glabrous, bulbiferous, bulbils ovoid, 20–35 (–50) × 15–20 (–25) mm, green, with 2–3 scarious bracts; **Ped** 3–7 mm, pilose; **Fl** 40–50 (–55) mm, single or 2–3 grouped together; **Tep** 25–30 mm, glabrous, whitish or whitish-greenish; **OTep** narrowly elliptic, 7–10 mm broad; **ITep** elliptic, 9–13 mm broad; **Fil** 10–13 mm, 1.5–2 mm wide at the broadened base; **Anth** oblong, 2–3 mm, yellow; **Ov** cylindrical, 17–20 × 3–4 mm; **Sty** 15–18 mm, 4–5 mm wide at the broadened base; **Sti** minute, 3-lobate; **Fr** ovoid to oblong, 30–50 × 25–40 mm, base constricted and deeply sulcate, tip beaked; **Se** flat, winged for 2 mm, 11–13 × 6–7 mm, shiny. — **Cytology**: 2n = 60 (Cave 1964: as *F. andina*, Fritsch 1970).

Characterized by large and remote teeth along the whole leaf margin, rhomboidal inflorescences with few part-inflorescences in the upper $\frac{3}{4}$ to nearly the whole inflorescence, flowers with very narrow tepals and a very short ovary much shorter

than the tepals (García-Mendoza 2001a). Older literature mostly uses the names *F. cubensis* (described from Cuba) or *F. macrophylla* (described from the Bahamas). The occurrence in places not given above, e.g. Colombia, needs verification. *F. andina* from Peru is considered to be native to that country by the majority of authors, and is cultivated for fibre as “Fique” in Ecuador, Peru and Colombia, where it represents the Colombian national fibre (Kluge 2016). It is here included in the synonymy by García-Mendoza (2001a) due to the lack of clear morphological differences. ‘Marginata’ is a cultivar with yellow-margined variegated leaves (Meer 2014b).

F. longaeva Karwinsky & Zuccarini (Flora 15: 2 (Beiblatt 2): 94–95, 1832). **Type:** [neo — icono]: Acta Acad. Leop.-Carol. Nat. Cur. 16(2): t. 48, 1833. — **Lit:** Ullrich (1991b); García-Mendoza (2001b); David (2009); Guillot Ortiz & Meer (2010); García-Mendoza (2011); all with ills. **Distr:** Mexico (S Puebla, Oaxaca); open mountain slopes in rosette scrub on stony igneous soils, 2200–3100 m; flowers February to May, but also August. **I:** Curtis’s Bot. Mag. 91: t. 5519, 1865; Trelease (1915b: t. 28); Phillips (2013).

Incl. *Furcraea longa* J. J. Smith (1897) (*nom. inval.*, ICN Art. 61.1?).

[2] Arborescent, stems erect, thick, simple, 3–6 (–9) × 0.4–0.7 m, bark violet-red, with a single terminal **Ros** with 150–300 leaves; spent leaves forming a dry skirt below the rosette, other **L** erect, linear-lanceolate, concave, keeled below, long acuminate, narrowed at the base to 5–8 (–11) cm, base 5–7 cm thick, smooth on both faces or below at the apex slightly scabrous, 1.2–1.6 m × 10–14 (–17) cm, dark green, margin finely denticulate, 12–27 denticles per cm, on a yellowish-green band, leaf tip hardened from the involute leaf margin, dry, deciduous; **Inf** erect, 3–6 (–9 (–13)) m, peduncle 0.3–1 m, green, glabrous, with deltoid brown-violet **Bra** 50–90 cm long, fertile part pyramidal, part-**Inf** 60–100, horizontal, 0.8–1 m, glabrous or pilose, yellowish-green, 2.-order branches 30–50, 10–30 cm, pendent, pilose or glabrous, 3.-order branches 5–15 cm, pilose, rarely with 4.-order branches to 4 cm, without bulbils; floral **Bra** inconspicuous,

much shorter than the pedicels; **Ped** 2–5 (–10) mm, pilose or glabrous; **Fl** (25–) 30–35 mm, 3–6 grouped together; **Tep** 15–20 mm; **OTep** narrowly elliptic, 4–6 mm broad, pubescent outside; **ITep** elliptic, 5–10 mm broad, pubescent on the midrib in the area of overlap, whitish-yellowish or yellowish-orange during senescence; **Fil** 8–11 mm, 1.5–3.5 mm wide at the broadened papillose base, whitish; **Anth** linear-oblong, slightly excentric, 2.2–6 mm, yellow-orange; **Ov** cylindrical, (10–) 15–20 × 2–5 mm, green, puberulent, neck 1–2 mm; **Sty** 10–17 mm, 2.5–4.5 mm wide at the broadened base, deeply 3-lobed, papillose, whitish; **Sti** 3-lobate, ciliate; **Fr** subglobose or oblong, rostrate, (35–) 40–50 × 25–30 (–35) mm, yellowish-green, rostrate for 3–6 (–10) mm, stipitate for up to 15 mm, tepals persisting; **Se** winged for 1 mm, 9–10 × 7–8 mm, shiny.

Easy to recognize by the large, linear-lanceolate, dark green leaves and the inflorescence without bulbils and with 3.- and 4.-order branches (García-Mendoza 2001b). Differs from its closest relative *F. parmentieri* in being larger in all parts except its flowers, in having inflorescences without bulbils, and in occurring in drier habitats (García-Mendoza 1998). The place of valid publication (usually thought to be in 1833) was clarified by Ullrich (1991b) who also selected a neotype (as ‘lectotype’).

Vernacular names: “pescadillo”, “tehuizote”, “palma”, “palmita”, “palmilla”, “yacktobiyack”, “yahuindayasi”, “la-fo-má-é”, and “pita”. The foam from crushed and washed fresh leaves is used for washing clothes, the dry leaves for making ropes, the flowers as fodder, and the dry stems for bee-keeping (García-Mendoza 1998, García-Mendoza 2001a, García-Mendoza 2001b).

The species was attributed to Guatemala by Skinner in Bateman (1837–1843: t. 16), but this appears to be a confusion with *F. quicheensis* (Lott & García-Mendoza 1994). Standley & Steyermark (1952) cite a collection made from a cultivated plant in Europe by Berger with a purported origin from Guatemala. There is at present no reliable record of the species from Guatemala (Lott & García-Mendoza 1994). Records from Guerrero

(Ullrich 1991b, García-Mendoza 1998) appear to represent *F. martinezii*.

With a maximum size of 13 m, the species exhibits the largest inflorescences of any plant according to Verhoek-Williams (1998), but it is superseded by *F. cabuya*, for which Robbins (2001) mentions 15 m. An inflorescence may have more than 58'000 flowers (García-Mendoza 2001a). In habitat, according to local Indians cited in the protologue, the species needs 400 years to come into flower. A more likely time span is between 50 and 100 years (García-Mendoza 1998). In cultivation, plants may flower already after 25 (or perhaps even 7 or 8?) years (Ullrich 1991b).

F. macdougallii Matuda (Cact. Suc. Mex. 1 (2): 24–26, ills., 1955). **Type:** Mexico, Oaxaca (*MacDougall* 269 [MEXU, MEXU]). — **Lit:** García-Mendoza (2001b); García-Mendoza (2003b: with ill.); García-Mendoza (2011). **Distr:** Mexico (S Puebla, W & C Oaxaca); tropical deciduous and thorn forests on calcareous soils, and cultivated, 750–1800 m; flowers September to December. **I:** Irish & Irish (2000: t. 63); Meer (2014c).

[1] Arborescent, stems erect, simple but offsetting from along fallen stems or old stem bases, 6–9 m, 30–70 cm Ø, bark reddish; **Ros** single at the stem tips, 4–6 m Ø, with 80–120 leaves, with a skirt formed by dry leaves; **L** erect, linear, in young plants pointing upwards, in old plants spreading in all directions, coriaceous, keeled, narrowed at the base to 4–7 cm, base to 8 cm thick, scabrous on both faces, papillose, 1.4–1.8 (–2) m × 6–10 cm, dark green to dull olive-green or yellowish-green, tip hard, sometimes with a 1 mm long mucro, reddish or yellowish, margin dentate-corneous or dentate-denticulate; **marginal teeth** 2–4 × 3–4 mm at the base, upcurved, reddish with yellowing base or brownish, separated by (1–) 2–5 cm at mid-leaf, and by 0.5–2 cm in the lower 1/3, denticulate between the teeth; **Inf** erect, 5–9 m, peduncle 1.5–3.5 m, green, glabrous, with triangular, semi-fleshy, dentate, green **Bra** 30–65 cm long, fertile part in the upper 1/2 of the inflorescence, rhomboidal, part-**Inf** 40–70, 1–1.5 m, glabrous to somewhat puberulent, 2.-order

branches 9–20, (6–) 15–30 cm, puberulent to tomentose, rarely with 3.-order branches to 15 cm, tomentose, bulbiferous, bulbils conical, 40–70 (–85) × 12–16 mm, with 5–8 deltoid bracts, those near the base scarious and deciduous; floral **Bra** inconspicuous, scarious; **Ped** 2–6 (–10) mm, puberulent; **Fl** 35–40 mm, 2–4 grouped together; **Tep** narrowly elliptic, 15–20 mm; **OTep** 3–4 (–6) mm broad, pilose outside; **ITep** 4–6 (–8) mm broad, pilose on the midrib, papillose in the area of overlap, whitish outside, yellowish within; **Fil** 9–12 mm, 2–3 mm wide at the broadened base, papillose, yellowish; **Anth** oblong, 2–2.5 × 1.5 mm, yellow; **Ov** cylindrical, 13–23 × 2–3 mm, yellowish-green, puberulent, neck 5–8 mm, glabrescent; **Sty** 13–16 mm, 3–4 mm wide at the broadened base, 3-sulcate, papillose; **Sti** superficially 3-lobate; **Fr** oblong, stipitate for 20–23 mm, rostrate for 5 mm, 40–50 × 30–35 mm; **Se** plane-convex, winged for 1–2 mm, 11–13 × 7–9 mm, shiny.

Recognizable by linear leaves with scabrous faces and dentate-corneous or dentate-denticulate margins, and conical bulbils (García-Mendoza 2001a, García-Mendoza 2001b). The thick terminal spine mentioned in the protologue was not found in the material seen by García-Mendoza (2001a). The species is apparently extinct in nature and survives in cultivation only at the Puebla/Oaxaca border (García-Mendoza l.c.), but is also commercially available in the US-American nursery trade. García-Mendoza (2003a) reports that a single inflorescence produced >15'000 bulbils, which persisted even after the plant has died. Two sterile collections from Chiapas by Matuda first provisionally placed here by Lott & García-Mendoza (1994) and García-Mendoza (1998) were later placed in a new, apparently closely related species, *F. niquivilensis*.

F. martinezii García-Mendoza & L. de la Rosa (Bol. Soc. Bot. México 66: 121–123, ills., 2001b). **Type:** Mexico, Guerrero (*García-Mendoza & de la Rosa* 6526 [MEXU etc.]). — **Lit:** García-Mendoza (2003a: with ills.). **Distr:** Mexico (C Guerrero); on sandy soils derived from volcanic ash in montane pine-oak cloud forest, 2000–2650 m; flowers April to May.

[2] Arborescent, stems erect, 2–4 (–8) m, simple, 0.3–0.4 m Ø; **Ros** single at the stem tip, with (100–) 150–200 leaves and a skirt formed by dry leaves; **L** linear to linear-lanceolate, narrowed at the base to 4–6 cm, base 4–5 mm thick, smooth above, below slightly scabrous at the hard deciduous tip, (0.9–) 1.2–1.6 m × 6–10 cm, dark green, margin denticulate, 15–19 denticles per cm, on a greenish-yellow band; **Inf** erect, 6–8 m, peduncle 0.5–1.5 m, green, glabrous, with deltoid, denticulate, brownish **Bra** 40 × 4–7 cm, fertile part pyramidal, with 100–200 part-**Inf** 1–1.5 (–2) m long, green, glabrous, 2.-order branches 10–25 cm long, rarely with 3.-order branches 3–7 cm long, bulbiferous, bulbils leafy, ovoid, 25–45 × 15–35 mm, covered with leafy reddish bracts; floral **Bra** inconspicuous, much shorter than the pedicel; **Ped** 4–6 mm, glabrous; **Fl** 25–32 mm, 3–4 grouped together; **Tep** 12–16 mm, whitish-green outside, whitish within, puberulent at the base; **OTep** narrowly elliptic, 3–4 (–6) mm broad; **ITep** elliptic, 5–7 (–8) mm broad; **Fil** 9–11 mm, 2–3 mm wide at the thickened papillose base, whitish; **Anth** oblong, 2.5–3 mm, yellow; **Ov** cylindrical, 13–15 × 3–4 mm, green, puberulent, neck 1–2 mm, sometimes puberulent; **Sty** 9–12 (–16) mm, 3–4.5 mm wide at the broadened base, truncate, deeply trisulcate, papillose, whitish; **Sti** 3-lobate; **Fr** subglobose to oblong, 35–45 (–50) × 30–40 mm, yellowish-green, stipitate for up to 15 mm, rostrate for 4–6 mm; **Se** winged for 2 mm, 11–12 (–14) × 7–8 (–9) mm, shiny.

Only known from 3 populations consisting of few, mainly adult individuals (García-Mendoza 2001a). Similar to *F. longaeva* with which it shares the long stem, large rosettes and a pyramidal inflorescence with up to 3.-order branches, but differing by narrower leaves, smaller flowers, larger seeds, and leafy bulbils. Records of *F. longaeva* from Guerrero belong here. A specimen which flowered at the botanical garden of Mexico City was estimated to be 40 to 60 years old, had an annual stem growth of 4–8 cm, and the inflorescence was estimated to have ± 20'000 to 30'000 flowers (García-Mendoza 2003a).

F. niquivilensis Matuda ex García-Mendoza (Novon 9(1): 42–45, ills., 1999). **Type:** Mexico,

Chiapas (*García-Mendoza & al.* 6441 [MEXU, ENCB, HEM, K, MO]). — **Lit:** Lott & García-Mendoza (1994: online version with ills.); García-Mendoza (2001b). **Distr:** Mexico (SE Chiapas), probably also adjacent Guatemala; at present only known from cultivation at settlements but probably from pine-oak or montane cloud forests, 1800–2700 m; flowers April to May.

[1] Arborescent, stems 1–3 × 0.3–0.4 m, unbranched, covered with old dry reflexed and persisting leaves; **Ros** 4–5 m Ø; **L** 80–150, erect, lanceolate, coriaceous, narrowed at the base to 7–8.5 cm, 5–5.5 cm thick, concave, keeled, scabrous or muricate on both faces, (1.7–) 1.9–2.1 m × 12–14 cm, green, tip acuminate, mucronate, conical, 1–2 (–3) × 0.5–1 mm, dark chestnut-brown, margins straight, dentate; **marginal teeth** upcurved or straight at the base, recurved at mid-leaf, and upcurved in the upper part, 5–6 (–8) × 3–4 (at the base) mm, chestnut-brown, base yellowish, decurrent so that the margin becomes corneous, on small deltoid bases, (1.5–) 2–4 cm apart at mid-leaf, 0.6–1.5 (–2) cm at the base; **Inf** 6–9 m, peduncle 1.5 m, puberulent, green, with triangular, dentate and mucronate **Bra** 50 × 5 cm, fertile part pyramidal, open, making up almost the whole inflorescence, with up to 55 puberulent part-**Inf** 2–2.3 m long, 2.-order branches 14–18, 30–60 cm, puberulent, bulbiferous, bulbils spheroidal to broadly conical, 50–70 (–110) × (30–) 45–65 mm, bracteate, covered by 4–6 broadly ovate, brownish to green persistent bracts, sometimes tinged reddish; **Ped** 4–8 mm, puberulent; **Fl** 65–75 (–80) mm, puberulent, single or 2–3 together; **Tep** elliptic, greenish-white, tinged reddish outside, whitish inside; **OTep** (30–) 40–45 × 11–13 mm, pilose, glabrescent; **ITep** 40–45 × 12–14 mm, pilose, glabrescent on the prominent mid-rib, papillose in the area of overlap; **Fil** 20–25 mm, 3–5 mm wide at the broadened papillose base, greenish-yellow; **Anth** oblong, 4–6 mm, yellow; **Ov** cylindrical, 30–35 (–38) × 3–6 mm, puberulent, green; **Sty** trigonous, papillose, 20–23 mm, 4–6 mm wide at the broadened base, 3-sulcate, papillose, greenish-yellow; **Sti** entire, sometimes ciliate; **Fr** oblong, 65–70 × 40 mm; **Se** winged for 4–5 mm, 18–19 × 10–12 mm.

Sterile collections of this plant by Matuda were provisionally included under *F. macdougallii* (Lott & García-Mendoza 1994, García-Mendoza 1998), but the clear differences such as longer leaf marginal teeth, a pyramidal inflorescence with longer 1.- and 2.-order branches, much larger flowers, and larger and broader bulbils merit species status. According to the protologue, both species appear to be closely related and share arborescent growth, leaves with both faces scabrous or muricate, as well as puberulent primary and secondary inflorescence branches, pedicels and ovaries. Both taxa are apparently extinct in nature and only survive in cultivation (García-Mendoza 2001a). *F. niquivilensis* is commonly planted as fence and to prevent soil erosion, and the fibres of the leaves are used to make baskets and ropes; this use was more common in the past and is presently restricted to a very small scale (García-Mendoza 1998). The flowers emit a lemon-like odour during night and are visited by hummingbirds at day when no nectar is produced (García-Mendoza 2001a).

F. occidentalis Trelease (Bot. Jahrb. Syst. 50 (Beiblatt 111): 5, 1913). **Type:** Peru, Lima (Weberbauer 1687 [B, G, GH, MEXU, NY]). — **Lit:** Macbride (1936); Ullrich (1992); Pino (2006). **Distr:** Peru (Ancash, Cajamarca, Cuzco, Huallaga, Huánuco, Lima, Loreto); NW Bolivia (La Paz); dry rocky slopes in scrubland, 2200–3860 m; flowers April to May and November to December. **I:** Pino (1996); García-Mendoza (2001a).

[1] Stems none or short; **Ros** 2.5 m Ø; **L** erect, linear-lanceolate, coriaceous, narrowed at the base to 3–5 cm, smooth on both faces, 60–70 (–100) × (4.5–) 8–10 cm, margins crenate, ± corneous, minutely aculeate; **marginal teeth** ± deltoid, simple, straight or upcurved, 1–2 mm, 0.5–1 (–2) mm broad at the base, on small bases, absent at the leaf tip, 0.2–0.8 (–1) cm apart, 0.4–0.6 cm at the base, yellowish; **terminal Sp** mucronate, obtuse and semiglobose, minute, weak, 0.5–1 × 1 mm, reddish-brown; **Inf** 4–6 (–12) m, peduncle green, glabrous, with triangular toothless **Bra** 10–23 cm long, fertile part to 2 m broad, part-**Inf** 50–80 cm, with 8–17 2.-order

branches 10–30 cm long, both glabrous, freely bulbiferous, bulbils conical, (25–) 30–40 × 6–10 (–13) mm, green, bracteate, with 2–4 scarious bracts; **Ped** (5–) 10–18 mm, glabrous; **Fl** (50–) 55–68 mm, single or 2 (–4) grouped together; **Tep** 30–33 (–38) mm, glabrous, with apiculate apex, whitish-green, creamy-white or green with white margins; **OTep** narrowly elliptic, 8–10 mm broad; **ITep** elliptic, 10–15 mm broad; **Fil** (14–) 16–20 mm, 3–4 mm wide at the broadened base, yellow-green; **Anth** oblong, 3–4 mm, yellow; **Ov** 25–30 × 5–6 mm; **Sty** 20–25 mm, 4–5 mm wide at the broadened base, yellow-green; **Fr** and **Se** unknown.

For long insufficiently known, until García-Mendoza (2001a) provided the first complete description. It is characterized by short leaves with small teeth to 2 mm, and absent at the tip, large glabrous flowers with apiculate tepals, and conical and bracteate bulbils. With its very small teeth, this species is closest to *F. longaeva* and other species of Sect. *Serrulatae* (García-Mendoza 2001a). It differs from the second Peruvian species *F. hexapetala* by narrower, less rigid and largely toothless leaves (Pino 1996: as *F. andina*).

The vernacular name in Peru is “champa qara” (Pino 2006). The leaves are used as detergent, for fibres and for extracting chemical constituents, and the peduncles for constructions (García-Mendoza 2001a). The sap of half-roasted leaves is used for curing bronchitis by rubbing it on the chest and back during night (De-la-Cruz & al. 2007). The flowers are visited by hummingbirds (García-Mendoza 2001a).

F. parmentieri (Roezl ex Ortgies) García-Mendoza (Bol. Soc. Bot. México 66: 115, ill. (p. 116), 2001b). **Type** [neo]: Ex cult. BG Berlin (Koch s.n. [B]). — **Lit:** McVaugh (1989: 198–200, with ill.); Ullrich (1991b: with ill.); García-Mendoza (2001b); Guillot Ortiz & Meer (2010: with ill.); all as *F. beddinghausii*; González-Martínez (2016: neophyte in Spain). **Distr:** Mexico (Jalisco, Guanajuato, Hidalgo, Veracruz, Michoacán, México, Distrito Federal, Morelos); volcanic soils derived from andesite, basalt or lava flows, mountain slopes and summits, in pine-oak cloud forests, 2300–3500 m;

Fig. 1 *Furcraea parmentieri*. (Copyright: U. Eggli)



flowers June to September; neophyte in Spain. **I:** Curtis's Bot. Mag. 117: t. 7170, 1891, as *F. bedinghausii*; Sánchez Mejorada (1966: as *F. bedinghausii*); Benítez B. (1986: 62, as *F. bedinghausii*); Etter & Kristen (2007). – Fig. 1.

≡ *Yucca parmentieri* Roezl ex Ortgies (1859) ≡ *Beschorneria parmentieri* (Roezl ex Ortgies) Jacobi (1864); **incl.** *Furcraea flaccida* Hort. Panorm. ex Hort. Kew (s.a.); **incl.** *Beschorneria floribunda* K. Koch (1859); **incl.** *Beschorneria multiflora* K. Koch (1859); **incl.** *Beschorneria multiflora* hort. ex K. Koch (1860) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Roezlia regia* Laurentius (1861); **incl.** *Agave argyrophylla* Hort. Tonel ex K. Koch (1862) (*nom. inval.*, ICN Art. 36.1c) ≡ *Yucca argyrophylla* (K. Koch) Lemaire (1863); **incl.** *Yucca toneliana* K. Koch (1862) (*nom. inval.*, ICN Art. 36.1c); **incl.** *Furcraea bedinghausii* K. Koch (1863) ≡ *Fourcroya bedinghausii* (K. Koch) André (1895) (*incorrect name*, ICN Art. 11.4) ≡ *Furcraea longaeva* ssp. *bedinghausii* (K. Koch) B. Ullrich (1991) (*nom. inval.*, ICN Art. 41.5); **incl.** *Agave toneliana* Hort. ex E. Morren (1863) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Roezlia regia* Lemaire (1863) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Roezlia bulbifera* Roezl (1881); **incl.** *Fourcroya roezlii* André (1887) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Roezlia regia* André (1887) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Yucca pringlei* Greenman (1898) (*nom. inval.*, ICN Art. 38.1a); **incl.** *Roezlia regina* Trelease (1915) (*nom. inval.*, ICN Art. 61.1); **incl.** *Yucca*

argyraea Trelease (1915) (*nom. inval.*, ICN Art. 61.1?).

[2] Arborescent, stems erect, thick, simple, 1.5–4 (–8) × 0.2–0.5 m; **Ros** 1 (–4) at the stem tip, 2–2.5 m Ø, with 100–150 leaves; **L** first ascending-spreading, later spreading to pendent, forming a dry skirt along the entire stem or just below the rosette, lanceolate to linear-lanceolate, stiff, ensiform, coriaceous, narrowed below the middle, base narrowed to 2–4 (–5) cm, 2–3 cm thick, long-attenuate, flat to concave or plicate, keeled, above striate and roughened by projections from the longitudinal veins, below asperous towards the tip, muricate above the veins, above scabrous, 60–90 (–120) × 5–8 (–10) cm, somewhat glaucous, margins straight, marginal teeth none, finely denticulate, denticles minute, irregularly spaced, pale, deltoid, 14–20 per cm, on a yellowish cartilaginous band, tip formed by hardened involute margins, < 1 mm; **Inf** erect, (2.5–) 4–6 (–9) m, peduncle 0.5–1 (–1.5) m, greenish, pubescent, with deltoid to lanceolate **Bra** 20–75 × 3.5–8 cm, brown or purple, fertile part narrowly pyramidal, greenish, pubescent, occupying nearly the whole inflorescence, with (50–) 80–130 part-**Inf** 1–1.5 (–2) m long, tips pendent, pubescent to glabrescent with age, 2.-order branches 0.3–0.6 (–0.9) m, pendent, pubescent, all branches with purple bracts, freely bulbiferous, bulbils leafy, conical to ovoid, 15–20 (–30) × (7–) 10–20 mm, covered with deltoid, scarious, deciduous bracts; floral **Bra** deltoid, scarious, <

10 mm, pubescent; **Ped** 5–10 (–15) mm, puberulent; **Fl** (35–) 45–55 mm, 2–4 grouped together; **Tep** elliptic or oblong-elliptic, (15–) 20–24 (–27) mm, green-white outside, whitish within, yellowish after anthesis; **OTep** narrowly elliptic, 4–6 (–8) mm broad, pubescent outside; **ITep** elliptic, 6–9 (–12) mm, pubescent on the prominent midrib, papillose in the area of overlap; **Fil** 10–14 mm, 2–4 mm wide at the broadened base, papillose, whitish; **Anth** oblong, 2–3 mm, yellow; **Ov** cylindrical, (15–) 20–25 (–30) × 2–7 mm, puberulent, in bud nearly lanate, green, neck 3–5 mm; **Sty** 13–18 mm, 2.5–5 mm wide at the broadened base, truncate, deeply 3-sulcate, somewhat papillose, yellowish; **Sti** shallowly 3-lobate; **Fr** oblong-ovoid to ovoid, 40–45 (–60) × (25–) 30–35 mm, rostrate for 4 mm, stipitate for up to 20 mm; **Se** plane-convex, winged for 2 mm, 9–11 × 6–8 mm, shiny. — **Cytology**: $2n = 60$ (Whitaker 1934: as *F. bedinghausii*).

This is the species common in the Trans-Mexican Volcanic Belt, easy to recognize by its short glaucous leaves rough below and with minute denticles, its narrowly pyramidal inflorescence with pendent 1.- and 2.-order branches, a short trunk and puberulent branches and flowers (García-Mendoza 1998). It is closely related to *F. longaeva*, but smaller in all its parts except the flowers (García-Mendoza 1998). Vernacular names: “Shishi” (“xixi”), “large sishi”, “tacamba”, “palma”, “palmilla”, “palmito”, “magueyito”,

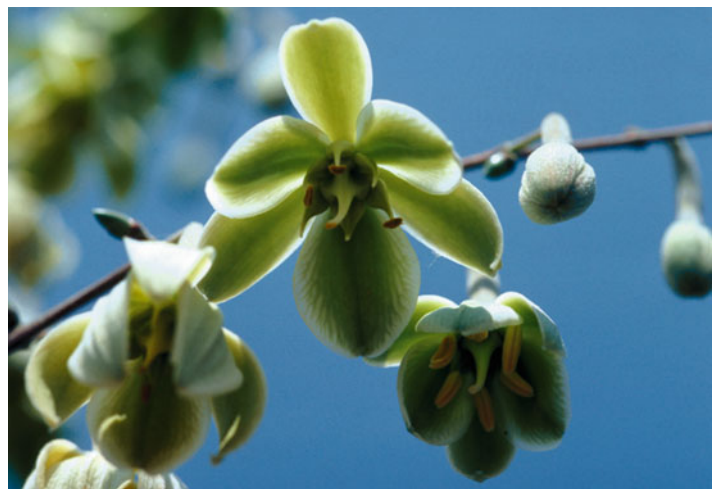
“izote”. The leaves and flowers are used as Easter decoration, the dried leaf fibres for binding sheaves of grain, and the whole plants as living fences (García-Mendoza 1998, García-Mendoza 2001a).

The *F. parmentieri* plant community on Pelado volcano (Mexico City) was studied by Almeida-Leñero & al. (2013), who found declining conditions due to repeated fires. According to Valverde & Hernández-Pedrero (2017), germination rate under field conditions reaches 40%, and the presence of nurse plants does not positively influence establishment rates. This is the only species of the genus at present widely grown outside in the UK (David 2009).

F. pubescens Todaro (Index Seminum [Palermo] 1877: 38, 1877). **Type**: not typified. — **Lit**: Todaro (1879: with ills.); McVaugh (1989: as *F. guerrensis*); García-Mendoza (1998: as *F. guerrensis*). **Distr**: México (S Nayarit, W Jalisco, Colima, Michoacán, México, Guerrero, Oaxaca); in calcareous, sandy or clayey soils or soils derived from volcanic rocks, in ecotones of tropical deciduous forests with pine-oak forests, subdeciduous tropical forests, and oak and pine-oak forests, rarely in montane cloud forests, 650–1900 m; flowers July to November, also in February, March and December. **I**: Matuda (1966: as *F. guerrensis*). — Fig. 2.

Incl. *Furcraea guerrensis* Matuda (1966).

Fig. 2 *Furcraea pubescens*. (Copyright: U. Eggli)



[1] Stems mostly none, rarely short, 0.3–0.7 m, simple; **Ros** 1.5–2 × 3–4 m; **L** 40–80 (–120), lanceolate, erect, coriaceous, narrowed at the base to 3–6.5 cm, 4–5.5 cm thick, keeled, apex acuminate, nearly flat in the lower part, concave in the upper part, smooth on both faces, 1.2–1.8 (–3) m × 10–15 cm, dark green, margins crenate, somewhat corneous esp. towards the base; **marginal teeth** deltoid, upcurved or straight, sometimes hooked, strong, 3–6 (–8) mm, 2–4 (–5) mm broad at the base, brown to dark-reddish, with yellowish bases, mostly with teeth throughout, sometimes toothless for 10–15 cm below the leaf apex, (2–) 3–5 (–7) cm apart at mid-leaf, 1–2 (–4) cm at the base, decurrent on prominent deltoid bases; **terminal Sp** conical, 1–4 (–8) mm, brown; **Inf** (3–) 5–8.5 m, peduncle short, 0.5–2 m, green, puberulent, with linear-lanceolate, toothed, green **Bra** (15–) 40–70 × 4–7.5 cm, fertile part pyramidal or ellipsoid, open, in the upper $\frac{3}{4}$ – $\frac{1}{2}$ of the inflorescence, **part-Inf** 40–80, (60–) 100–150 cm, longest at mid-inflorescence, puberulent to tomentose, green, with 5–12 (–25) 2.-order branches 10–30 cm long, puberulent, tomentose or velutinous, green, with reddish tinge, bulbiferous, bulbils ovoid to conical-ovoid, (20–) 25–30 (–45) × 15–20 (–25) mm, green, covered with 3–4 suborbicular bracts, brownish; **Bra** at the base of the flower clusters <3 mm, deciduous; **Ped** 5–10 (–15) mm, puberulent to velutinous; **Fl** (50–) 55–65 (–70) mm, single or 2–3 (–4) grouped together; **Tep** (23–) 25–30 (–35) mm, whitish-green to yellowish, sometimes with reddish tinge outside; **OTep** narrowly elliptic to lanceolate, 6–10 (–13) mm, puberulent to glabrescent; **ITep** elliptic, 10–15 (–21) mm, puberulent on the midrib; **Fil** 15–18 mm, 3–4 mm wide at the broadened papillose base, yellowish-white; **Anth** oblong, base sagittate, 3–4 (–7) × 1–2 mm, yellow; **Ov** cylindrical, (20–) 25–30 (–35) × (2–) 3–4 mm, puberulent to tomentose, green, neck 5–7 mm; **Sty** (18–) 20–25 mm, 4–6 (–10) mm wide at the broadened base; **Sti** papillose; **Fr** ovoid to pyriform, 60–80 (–95) × 35–50 (–55) mm, rostrate, base and rostrum puberulent, stipitate for 10–20 (–25) mm, stipe glabrescent; **Se** plane-convex, with broad wing 5–6 (–8) mm, 15–20 (–22) × (7–) 8–10 (–12) mm, shiny. —

Cytology: $2n = 60$ (Satô 1935: as *F. pubescens*), but uncertain whether applying to this taxon, or to *F. pubescens* Baker = *F. undulata*.

F. pubescens is based on material flowering 1877 at Palermo. Baker (1888) and Baker (1892) misnamed plants cultivated in the UK and attributable to *F. undulata* as *F. pubescens* (Drummond 1907). García-Mendoza (1998) attributes the name to plants from the state of México and adds *F. guerrerensis* as synonym. As now circumscribed, *F. pubescens* is characterized by its usually acaulescent habit, leaves smooth on both faces with large teeth, open pyramidal or ellipsoid inflorescences with short peduncles and puberulent flowers, peduncles and branches, ovoid to conical-ovoid bulbils, and seeds with broad wings. Vernacular names: “maguey de pita”, “maguey” (“wechi en triqui”), “maguey de ixtli”, “maguey de zopilote”, and “yú-gua oo yuwa”. Locally used (formerly more wide-spread) for fibre and as living fence, the flowers are eaten, and the leaf juice is used to stupefy fishes (García-Mendoza 1998, García-Mendoza 2001a).

F. quicheensis Trelease (Trans. Acad. Sci. St. Louis 23(3): 148, t. 29, 1915). **Type:** Guatemala, Quiché (Cook 421 [US]). — **Lit:** Standley & Steyermark (1952); Lott and García-Mendoza (1994: online version with ills.); García-Mendoza (2001b: with ills.). **Distr:** Mexico (E Chiapas), W Guatemala (Huehuetenango, San Marcos, Totonicapan, Quetzaltenango, Solola, Quiché), Honduras; oak forests, sometimes on exposed sites in montane pine-oak cloud forests, on soils derived from volcanic ash, cultivated or escaped from cultivation, 2000–3300 m; flowers April to August. **I:** Schröter (1992).

[2] Arborescent, stems erect, thick, naked, simple or 4–5 × branched, 1–2 × 0.2–0.4 m; **Ros** at the stem tip, 2–3 m Ø; **L** 60–100, erect, forming a dry skirt below the rosette, lanceolate, erect, spreading or reflexed, gradually narrowed towards the base, base 4–7 cm broad, 3–6 cm thick, broadly attenuate, flat or slightly channelled, subcoriaceous, smooth, below with prominent venation, 80–120 (–150) × 7–10 (–14) cm, glaucous to glaucous-green, margin narrow, minutely denticulate, denticles 8–10 per cm, yellow, on a

cartilaginous band, **L** tip hardened by the involute margins, narrowly rounded, obtuse, without terminal spine; **Inf** erect, 2–5 m, peduncle 1–2 m, green, often red, glabrous, with triangular **Bra** 20–60 × 5–12 cm, fertile part narrow, oblong, in the upper $\frac{2}{3}$ – $\frac{3}{4}$ of the inflorescence, part-**Inf** 50–80, (15–) 50–70 (–100) cm, sometimes with 2.-order branches to 10 cm, green, glabrous, without bulbils; **Bra** at the base of the flower clusters deltoid, 4–8 cm, much larger than the pedicels, reddish, bracteoles deltoid, scarious, <1.5 cm; **Ped** (10–) 20–35 mm, reddish, glabrous; **Fl** (50–) 55–65 (–70) mm, 3–5 grouped together; **Tep** elliptic, suberect or somewhat spreading, (20–) 25–30 (–35) mm; **OTep** 4–7 (–9) mm broad; **ITep** 6–9 (–12) mm broad, with prominent midrib, (pale) green with brownish tinge outside, greenish-whitish or greenish-yellow within, glabrous; **Fil** 10–14 mm, 2–4 mm wide at the broadened base, somewhat papillose, whitish; **Anth** oblong, 2–2.5 mm, yellow; **Ov** cylindrical, 25–30 (–39) × 3–5 (–7) mm, dark green to brown-green, glabrous, neck <2 mm; **Sty** 13–17 mm, 2–4 mm wide at the broadened base, papillose; **Sti** shallowly 3-lobate; **Fr** oblong, 50–70 (–80) × 20–30 (–35) mm, somewhat lustrous, contracted at the base, rostrate for 5 mm, stipitate for 20–30 mm; **Se** winged for 1 mm, 8–10 × 5–7 mm, shiny.

The above description largely follows García-Mendoza (2001a) and García-Mendoza (2001b); morphological measurements in Lott & García-Mendoza (1994) and García-Mendoza (1998) partly differ.

Characterized by the narrow inflorescences without bulbils, large, glabrous flowers, oblong fruits and glaucous leaves (García-Mendoza 2001b). Common on the W Guatemalan highland where it often is a conspicuous feature of the landscape (Standley & Steyermark 1952). The species apparently reproduces by seeds, since no bulbils were seen or reported. Vernacular names: “Mecate”, “mecatl”, “cheche”, “palma”, “chijute”, “maguey”, and “micato”. The plants are used as ornamentals and to prevent soil erosion, the leaves to extract fibres and as religious Easter decoration, which relates to its abundance near settlements, at the borders of agricultural land, or around houses

(García-Mendoza 1998, García-Mendoza 2001a). Nelson (2008) provides a new record for Honduras. Ullrich (1991b) placed the species in the *F. longaeva*-complex.

F. samalana Trelease (Trans. Acad. Sci. St. Louis 23(3): 149, tt. 30–31, 1915). **Type:** Guatemala, Quetzaltenango (Trelease 20 [ILL]). — **Lit:** Standley & Steyermark (1952); Lott & García-Mendoza (1994: online version with ills.). **Distr:** Mexico (Chiapas), Guatemala (Quetzaltenango, Retalhuleu, Suchitupéquez), El Salvador?, generally cultivated only; in flat and brown stony soils, disturbed sites on rocky slopes in scrub or pine-oak forests, often in moist thickets or more often in dry places, 400–2000 m; flowers July to September.

[1] Stems none, simple; **Ros** 2–3 × 4–6 m; **L** 150–200, broadly lanceolate, erect, cartilaginous, tapering at the base to 6–9 cm, 4–6 cm thick, apex long acuminate, convex below, channelled above, smooth on both faces, (1.3–) 1.8–2.6 m × (12–) 20–25 cm, green, margins straight to somewhat crenate; **marginal teeth** upcurved or straight, (2–) 3–5 (–7) × 2–4 mm, brownish to blackish, 2.5–4.5 (–6) cm apart at mid-leaf, 1.5–2 cm below, lacking in the upper $\frac{1}{2}$ – $\frac{2}{3}$ of the leaf, decurrent on low fleshy bases, sometimes forming a corneous band down to the base; **terminal Sp** normally lacking, or mucronate, conical, 1–2 mm, reddish; **Inf** 5–8 m, peduncle 2.5–3 m, green, glabrous, with deltoid, dentate, mucronate, green **Bra** 50 × 7.5 cm, margin entire or with few denticles near the constricted base, fertile part lax, narrow, oblong, with 25–35 part-**Inf** in the upper $\frac{3}{4}$ of the inflorescence, <75 cm, glabrous, 2.-order branches (5–) 10–30 cm, glabrous, bulbiferous, bulbils 50–65 × 20 mm, leafy, with dull grey-green scales and 6–8 small leaves, green, conical-ovoid; floral **Bra** much shorter than the pedicels; **Ped** 3–9 mm, glabrous; **Fl** (45–) 50–55 (–57) mm, single or 2–3 grouped together; **Tep** 25–35 mm, greenish-white outside, yellowish-green within, glabrous; **OTep** elliptic, 10–13 mm broad; **ITep** broadly elliptic, 13–18 mm broad; **Fil** dorsiventrally flattened, 12–14 mm, 2–3 mm wide at the broadened base, papillose, yellowish; **Anth** oblong, 4–6 mm, yellow; **Ov** cylindrical, 20–25

(–27) × 2–4 mm, glabrous, greenish-white; **Sty** 19–22 mm, 4.5 mm wide at the broadened base; **Sti** papillose; **Fr** and **Se** not known.

Standley & Steyermark (1952) and Lott & García-Mendoza (1994) record the species from El Salvador (*Villacorta* 787, MO), but this view is not shared by García-Mendoza (2001a). Vernacular names: “ixtle”, “mecate”, “pita”, “jasite”, “maguey”, and “maguey ixtle”. The leaf fibres are used for making ropes for backpacks, hammocks and nets.

F. selloana K. Koch (Wochenschr. Vereines Beförd. Gartenbaues Königl. Preuss. Staaten 3: 22, 1860). **Type**: not typified. — **Lit**: Verhoek & Hess (2002); Wilcox (2005); Guillot Ortiz & Meer (2010); Aedo (2013); Smith & Figueiredo (2016: neophyte in RSA); Guillot Ortiz & al. (2016: neophyte in Spain); **Distr**: Colombia (Antioquia, Cauca, Cundinamarca, Huila, Magdalena, Santander, Tolima, Valle), Ecuador (Chimborazo, El Oro, Loja, Los Rios, Islas Galápagos); cultivated or as escape at anthropogenic and disturbed sites, wild possibly in dry river valleys and lowlands, 1000–2600 m; cultivated and naturalized in many parts of the world (e.g. RSA, Spain); flowers June to October. **I**: Curtis’s Bot. Mag. 86: t. 5163, 1860, as *F. flavoviridis*; Curtis’s Bot. Mag. 101: t. 6148, 1875; Irish & Irish (2000); Smith & Figueiredo (2012).

Incl. *Agave cubensis* var. *striata* hort. (s.a.) (*nom. inval.*, ICN Art. 29.1); **incl.** *Furcraea selloa* hort. (s.a.) (*nom. inval.*, ICN Art. 61.1); **incl.** *Furcraea flavoviridis* Hooker (1860); **incl.** *Furcraea lindenbergii* Jacobi ex Anonymus (1869); **incl.** *Furcraea albispina* Hort. Panorm. ex Baker (1893); **incl.** *Furcraea tuberosa* Franceschi (1900) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Furcraea selloana* var. *edentata* Trelease (1915a) ≡ *Furcraea selloana* fa. *edentata* (Trelease) H. Jacobsen (1954) (*nom. inval.*, ICN Art. 41.5); **incl.** *Furcraea selloana* var. *marginata* Trelease (1915a).

[1] Stems usually none or short, to 0.3 or sometimes 0.9 (–1.5) m; **Ros** 3–4 m Ø; **L** 40–60, linear-lanceolate to oblanceolate, erect, straight, coriaceous, narrowed to 4–5 cm at the base, concave, rough below (fide protologue and various authors) or smooth (fide García-Mendoza

(2001a)), (0.7–) 1–1.7 (–2.4) m × (7–) 10–15 cm, green, margins with teeth throughout; **marginal teeth** simple, upcurved, straight or recurved, rarely 1–3 bifid, 4–7 × 3–4 mm, 2.5–5 (–7) cm apart at mid-leaf, 3–4 cm below, chestnut-brown, decurrent on prominent bases, rarely forming a corneous band up to the base, leaf tip acuminate, mucro conical, 1–3 mm, deciduous, chestnut-brown; **Inf** 6–10 m, peduncle 2–3 m, green, glabrous, with oblong to lanceolate, mucronate, green, glabrous **Bra** 11–35 (–50) cm, fertile part lax, oblong, in the upper ½ of the inflorescence, part-**Inf** 40–60, patent to pendulous, (60–) 80–130 cm, green, glabrous, with 6–12 2.-order branches (5–) 10–30 cm long, green, glabrous, freely bulbiferous, bulbils ovoid to ovoid-conical, 20–50 × 15–30 mm, bracteate to somewhat foliose, with 2–4 green bracts and 3–4 small leaves; floral **Bra** small, subulate, scarious, green; **Ped** 5–10 mm, glabrous; **Fl** (37–) 45–50 (–55) mm, 1–4 grouped together; **Tep** spreading and incurved, tip rounded, (20–) 25–30 mm; **OTep** narrowly elliptic, 7–10 (–12) mm; **ITep** elliptic, 10–15 mm broad, whitish-green to greenish-yellow; **Fil** 10–14 mm, 2–4 mm wide at the broadened base, greenish-white; **Anth** oblong, 3 mm, yellow; **Ov** cylindrical, (15–) 20–25 × 3–5 mm, glabrous; **Sty** 15–20 mm, 4–5 mm wide at the broadened base; **Sti** 3-lobate; **Fr** and **Se** unknown. — **Cytology**: 2n = 60 (Whitaker 1934).

The name was published in January 1860 and thus antedates *F. flavoviridis* (publ. February 1860) (Drummond 1907). Described from material cultivated at Potsdam (Germany) and purportedly originating from Quetzaltenango, Guatemala, but neither cultivated plants nor herbarium records are known from that country (Trelease 1915b, Lott & García-Mendoza 1994, García-Mendoza 2001a). The species is at present not certainly known from C America (Lott & García-Mendoza 1994).

F. selloana belongs into a group with *F. cabuya* and *F. hexapetala*, sharing flowers with an ovary much shorter than the tepals and ovoid bulbils, but is separated from both by its linear-lanceolate leaves, 23–35 (–50) teeth per leaf margin and variably sized, oblong, lax inflorescences, and oblong bracts with denticles at their apex only. Specimens with bifid teeth might indicate

hybridization with *F. acaulis* (García-Mendoza 2001a). Vernacular names: “fique”, “cabuya”, “penca” and “mión-kei-úvi” (“maguey”). Planted as fence or hedge or ornamental (esp. the variegated forms). The leaf fibres are used for making bags and sacks (García-Mendoza 2001a).

The variegated form was introduced in 1867 from the Cauca valley in Colombia by the botanical traveller Wallis and published by Jacobi (1870: 79–80) as *F. lindenii*. Several variegated or toothless horticultural variants have been described. The variegated form (var. *marginata*) with creamy-yellow stripes along the leaf margin and sometimes light creamy streaks on the lamina is much more common in cultivation than normal green forms (Irish & Irish 2000). Reported as local neophyte from C Portugal by Silva & al. (2015).

[Editorial note by U. Eggli:] The name was originally published with the spelling ‘selloa’, which is sometimes amended to ‘selloi’. Since the epithet honours Hermann Sello, the name must be corrected to ‘selloana’ under ICN (2018) Art. 60.8c (see Figueiredo & Smith (2016)).

F. stricta Jacobi (Abh. Schles. Ges. Vaterl. Cult., Abth. Naturwiss. 1869: 171, 1869). **Type:** not typified. — **Distr:** Not known to be extant.

[1] Acaulescent; **Ros** rather regular, 0.9 m Ø; **L** ± 30, linear-lanceolate, straight, rigid, coriaceous, spreading to all directions, narrowed to 3.8 cm above the base, gradually narrowed from mid-leaf towards the tip, convex below and subacutely keeled, above below the base flat or concave, so deeply channelled as to be almost triquetrous in section above mid-leaf, scabrous below, smooth and somewhat shiny above, 60–76 × 5–6.3 cm, vivid light green to bright green, margins straight, narrow, somewhat reddish; **marginal teeth** strong, rigid, distant, tip corneous, uncinat, reddish chestnut-brown on broad deltoid reddish bases, leaf tip straight, upper end soon drying; **Inf** erect, 2.43–2.74 m, green, glabrous, peduncle very short, ± 0.45 m, with lanceolate appressed **Bra** to 12.5 cm long below, fertile part 2 to 2.3 m, with part-**Inf** longest at mid-inflorescence, ascending-spreading, somewhat incurved above the middle, 30–35 cm, 2.-order branches very short, to 1 cm, bulbiferous,

bulbils many, partly somewhat laterally flattened, partly inconspicuously obtusely trigonous; **Ped** very short; **Fl** not known whether single or in groups, ovoid; **Tep** incurved, whitish-green; **OTep** lanceolate, tip somewhat thickened, 25 × 8 mm; **ITep** elliptic, with fleshy midrib, 25 × 10 mm; **Fl** 10 mm, 2.5 mm wide at the broadened base; **Anth** elliptic, sagittate, 4 mm, golden-yellow; **Ov** clavate, bluntly trigonous, 15 × 4 mm, papillose; **Sty** longer than the stamens, 15–17 mm, 4 mm wide at the broadened base; **Sti** slightly thickened, capitate; **Fr** and **Se** unknown.

Insufficiently known, and first described from a plant that flowered in the Demoulin garden in Mons (Belgium) in 1868, later also grown at Kew from material from the Berlin Botanical Garden (Baker 1888). Characterized by deeply channelled leaves scabrous below, inflorescences with a very short peduncle, and esp. by the laterally somewhat compressed bulbils (terete in all other species except *F. stratiotes*, here included in *F. acaulis*). The name was for long considered as unresolved (e.g. in the first edition of this handbook and in the revision of García-Mendoza (2001a), but was recently re-established by Govaerts (2014+). Govaerts places *F. elegans* in the synonymy here, whereas García-Mendoza (2001a) is followed here, to treat it as synonym of *F. hexapetala*. Modern records of *F. stricta* possibly refer to *F. hexapetala*.

F. tuberosa (Miller) W. T. Aiton (Hort. Kew., ed. 2, 2: 303, 1811). **Type:** [icono]: Plukenet, Almag., 19, 1700. — **Lit:** Drummond (1907); Álvarez de Zayas (1996); Proctor & Acevedo-Rodríguez (2005); Smith & Figueiredo (2012); all with ills. **Distr:** Lesser Antilles, Bahamas, Haiti, Puerto Rico, Dominican Republic, French Guiana, Guyana & Suriname (natural?), Brazil, Paraguay (?), cultivated worldwide; in Guyana and Suriname in tropical lowland forests, otherwise mostly in secondary anthropogenic habitats near roads or settlements, 50–400 m; flowers July to August in Guyana & Suriname, in the Caribbean January to October.

≡ *Agave tuberosa* Miller (1768) ≡ *Fourcroya tuberosa* (Miller) Hooker (1860) (*incorrect name*, ICN Art. 11.4); **incl.** *Agave tuberosa* Lamarck (1784) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Agave*

tuberosa Aiton (1789) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Agave tuberosa* var. *β spinis solitariis* Aiton (1789) (*nom. inval.*, ICN Art. 23.1); **incl.** *Furcraea spinosa* O. Targioni Tozzetti (1808) ≡ *Agave spinosa* (O. Targioni Tozzetti) Steudel (1840); **incl.** *Yucca superba* Roxburgh (1814) (*nom. illeg.*, ICN Art. 52.1); **incl.** *Agave gigantea* Tussac (1818); **incl.** *Agave vivipara* Maycock (1830) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Agave commelynii* Salm-Dyck (1834) ≡ *Furcraea commelynii* (Salm-Dyck) Kunth (1850); **incl.** *Agave angustifolia* Hort. Par. ex Steudel (1840) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Furcraea gigantea* var. *willemetiana* M. Roemer (1847); **incl.** *Agave cubensis* Hasskarl (1856) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Furcraea interrupta* Hort. van Houtte ex Jacobi (1869); **incl.** *Furcraea lipsiensis* Jacobi (1869); **incl.** *Fourcroya vivipara* hort. (1869) (*incorrect name*, ICN Art. 11.4); **incl.** *Furcraea tuberosa* Fenzl ex Baker (1879) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Agave gigantea* Baker (1888) (*nom. illeg.*, ICN Art. 53.1); **incl.** *Agave campanulata* Sessé & Moçño (1894).

[1] Stems none or short, hardly 30 cm, moderately rhizomatous; **Ros** semiglobose in outline, 1.5–2 × 2–3 m; **L** 50–70, oblong-elliptic, erect, coriaceous or cartilaginous, semi-concave, 4.5–6 (–10) cm broad at the base, keeled below, smooth, 1–1.5 (–2) m × (10–) 15–20 cm, yellowish-green, glossy, margins between the teeth crenate, sometimes with a corneous band towards the base; **marginal teeth** simple, small, straight or recurved, 1–3 (–4) × (1–) 2–3 mm, decurrent on prominent deltoid bases, 1–2.5 (–3) cm apart at mid-leaf, 1–3 cm below, lacking in the upper ½ – ⅔, brown-reddish or blackish, with yellow base, **L** tip broadly acuminate, canaliculate, mucro thickened, flattened and folded, sometimes horny, (1–) 2–4 mm, reddish; **Inf** 4–7 m, peduncle 2–3 m, green, glabrous, with deltoid, mucronate, entire, pilose, green **Bra** 6 cm long, fertile part lax, oblong to rhomboidal, in the upper ½ of the inflorescence, part-**Inf** 30–40, 45–100 (–150) cm, glabrous, with 4–15 2.-order branches 10–30 cm long, glabrous, freely bulbiferous, bulbils conical to conical-ovoid, (20–) 30–50 (–70) × 10–20 (–25) mm, with 3–5 bracts and 3–4 broadly lanceolate small leaves 3–7 (–10) cm long; floral

Bra deltoid, 4–7 mm, deciduous; **Ped** 5–10 (–15) mm, glabrous; **Fl** (47–) 50–55 (–57) mm, single or 2–3 grouped together; **Tep** 25–30 mm, glabrous, whitish-green to greenish-yellow; **OTep** narrowly elliptic, 6–10 mm broad; **ITep** broadly elliptic, 10–15 mm broad; **Fil** dorsiventrally flattened, 10–15 mm, 2–4 mm wide at the broadened base, yellow; **Anth** oblong, 2–3 (–6) mm, yellow; **Ov** cylindrical, (22–) 25–30 × 3–4 mm, glabrous, “perhaps not functional” fide Proctor & Acevedo-Rodríguez (2005); **Sty** 15–20 (–22) mm, 3–4 (–5) mm wide at the broadened base; **Sti** papillose; **Fr** and **Se** unknown.

The typification of this name remains unresolved: Howard & Thompson-Mills (1979) designate a Plukenet plate (Almagestum, 19, 1700, showing an unarmed plant) as type, but this is in conflict with the protologue, which describes an armed plant. García-Mendoza (2001a) selected a neotype (Commelin, Horti Med. Amstelod. 2: 35, 5. 19, 1701), but since García-Mendoza’s thesis was not formally published, the selection remains inoperative.

Characterized by oblong-elliptic or broadly lanceolate leaves with a very narrow base, small, prominent teeth placed close together in the lower ½ or ⅔ of the leaves, a canaliculate tip with thickened and flattened mucro, and an ovary as long as the tepals (García-Mendoza 2001a). The species is cultivated since earliest times in the Americas and later worldwide as “Mauritius hemp”, esp. in the 19. and 20. century on Mauritius. The occurrence in Guyana and Suriname is natural (García-Mendoza 2001a). It reproduces entirely by bulbils (Proctor & Acevedo-Rodríguez 2005).

F. samalana is very close and García-Mendoza (2001a) treats it as a mere variety of *F. tuberosa*, but the combination is not validly published. *F. tuberosa* is also similar to *F. hexapetala* (Álvarez de Zayas 1996, Smith & Figueiredo 2012), but differs in its oblong-elliptic, mostly broader leaves smooth on both faces with brown-reddish teeth and larger flowers (vs. narrower, lanceolate leaves scabrous below with blackish to reddish teeth and smaller flowers).

Vernacular names: “guassu” (Brazil), “karata” or “carata” (Guadalupe), “pite” (Haiti), “maguey”, “maguey criollo” or “female karata” (Puerto

Rico), “langue boeuf” (Trinidad), “aloés créole” (“sábila criolla”) (Mauritius), and “shikwenga” (Moçambique) (García-Mendoza 2001a).

F. undulata Jacobi (Abh. Schles. Ges. Vaterl. Cult., Abth. Naturwiss. 1869: 170, 1869). **Type:** not typified. — **Distr:** Mexico (?). **I:** Curtis’s Bot. Mag. 100: t. 6160, 1874; Curtis’s Bot. Mag. 118: t. 7250, as *F. pubescens*;

Incl. *Furcraea aitonii* Jacobi (1869); **incl.** *Furcraea pubescens* Baker (1892) (*nom. illeg.*, ICN Art. 53.1).

[1] **Ros** (almost) acaulescent, small, to 0.9 m Ø; **L** few, (12–)20–30, younger leaves somewhat erect-recurved, older leaves spreading-recurved or strict, partly nearly horizontal, (narrowly) lanceolate to ensiform, coriaceous but not rigid, narrowed towards the broadened semi-amplexicaul base, base to 10 cm broad, above the base 1.9–3.8 cm broad, at mid-leaf ±3 mm thick, long-acuminate, below sharply keeled in the lower ⅓, obscurely keeled in the middle, asperous, channelled above, at mid-leaf very shallowly grooved, smooth, 40–45 × 5–10 cm, fresh to dull dark olive-green, not glaucous, margins strongly wavyly curved; **marginal teeth** stout, triangular, upcurved, regular along the whole margin, or reduced in the upper ⅓, 2–3 mm, brown, on small deltoid bases; **terminal Sp** straight, (scarcely) pungent, 2.5 mm, obtusely conical, corneous, chestnut-brown; **Inf** ± 3 m, peduncle green, with few subulate bracts, fertile part elongate, slender, narrow, pubescent, in the upper ⅓, with ascending, more erect than spreading, simple, strict part-**Inf** to 30 cm, tips pendent, bulbils not mentioned; floral **Bra** minute; **Ped** ± 6 mm; **Fl** usually geminate, 50–63 mm Ø; **Tep** narrowly oblong to oblong-lanceolate, obtuse, obtusely keeled down the centre, 10–13 mm broad, pale green to greenish-white; **Fil** ½ as long as the tepals, subulate above, broadened base deltoid; **Anth** short, yellow; **Ov** cylindrical, ± 25 mm, green, pubescent (but glabrous according to Baker (1879)); **Sty** deeply 3-lobed below, subulate above, about as long as the filaments; **Fr** and **Se** unknown. — **Cytology:** 2n = 60 (Satô 1935), as *F. pubescens*, but undecidable whether applying to *F. pubescens* Baker (and thus belonging here), or to *F. pubescens* Todaro.

Introduced by Ghiesbreght for the nursery Verschaffelt (Gand, Belgium). Differs from all other species except *F. depauperata* in its wavyly curved leaf margins. It was published from sterile plants allegedly from Chiapas and Tabasco (Mexico) where Ghiesbreght mainly travelled the years before. *F. undulata* is at present unknown in habitat or cultivation; no material from S Mexico matches the description (Lott & García-Mendoza 1994), and records for El Salvador (Standley & Calderón 1941: 52), the Lesser Antilles or Puerto Rico and cultivated plants labelled *F. undulata* are all doubtful. A specimen from the Bahamas doubtfully placed here (Drummond 1907) is placed in *F. hexapetala* by Britton & Millspaugh (1920: 77, as *F. macrophylla*). Baker (1892) misnamed plants with a wavy margin and thus attributable here as *F. pubescens*. See also under *F. depauperata*.

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