Floribunda 9 (2) 2026: 45 — 51
https://ejournal.brin.go.id/floribunda/
DOI: 10.55981/floribunda.2026.16962
P-ISSN : 0215 - 4706, E-ISSN : 2460 - 6944

Report on the Naturalized *Furcraea foetida* (L.) Haw. (Asparagaceae) in Java, Indonesia

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Received 19 August 2026; revised 26 August 2026; accepted 26 August 2026;
available online; October published

ABSTRACT

Arifin Surya Dwipa Irsyam 2026. Laporan mengenai *Furcraea foetida* (L.) Haw. (Asparagaceae) yang ternaturalisasi di Jawa, Indonesia. Floribunda 9(2) 45 — 51 — *Furcraea* merupakan suatu anggota dari suku Asparagaceae yang berasal dari Dunia Baru. Sebanyak dua jenis, telah lama diintroduksi ke Jawa sebagai tanaman hias, yaitu *F. foetida* (L.) Haw. dan *F. tuberosa* (Mill.) W.T.Aiton. Berdasarkan penelitian sebelumnya, kedua jenis tersebut hanya diketahui tumbuh dalam budi daya. Namun, studi lapangan menunjukkan bahwa *F. foetida* telah mengalami naturalisasi di Sumedang, Jawa Barat. Tulisan ini menyajikan catatan pertama mengenai keberadaan *F. foetida* yang tumbuh secara spontan di Jawa.

Kata kunci: Asparagales, *Furcraea*, Malesia, Monokotil, Ornamental.

Arifin Surya Dwipa Irsyam 2026. Report on the Naturalized *Furcraea foetida* (L.) Haw. (Asparagaceae) in Java, Indonesia. Floribunda 9(2) 45 — 51 — *Furcraea* is a member of Asparagaceae native to the New World. Two species were introduced long time ago to Java for ornamental purposes, namely *F. foetida* (L.) Haw. and *F. tuberosa* (Mill.) W.T.Aiton. According to previous studies, both species have been recorded only from cultivation. However, field observations revealed that *F. foetida* has become naturalized in Sumedang, West Java. This paper presents the first report on spontaneously occuring *F. foetida* in Java.

Keywords: Asparagales, *Furcraea*, Malesia, Monocot, Ornamental.

INTRODUCTION

Furcraea Vent. is naturally distributed from Mexico to Tropical America and comprises 26 accepted species (POWO, 2026). Taxonomically, the genus is currently placed in the Asparagaceae based on molecular studies (Bogler *et al.*, 2006; Chase *et al.*, 2009; APG IV, 2016). *Furcraea* can be distinguished morphologically from *Agave* L. by several diagnostic characters. The inflorescence of *Furcraea* is consistently a large, pyramidal panicle, whereas the latter generally has a narrowly elongate to relatively broad panicle, or occasionally an elongated spike or raceme. The flowers of *Furcraea* are pendent and white to whitish, in contrast to the typically erect flowers of *Agave*, which are rarely whitish. The leaves of *Furcraea* are generally more flexible and have a less conspicuous terminal spine. In addition, the filaments are shorter than the tepals, whereas in *Agave* they are usually longer than the tepals. The tepals in *Furcraea* are also free or nearly free, while those of *Agave* are fused at the base to form a relatively long tube (Backer & Bahkuizen van

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den Brink, 1968; Verloove *et al*., 2019).

Several species of *Furcraea* are of considerable economic importance and are cultivated for a variety of purposes, including fibre production (*F. foetida* (L.) Haw.), food (*F. andina* Trel.), medicinal use (*F. cabuya* Trel. and *F. selloa* K.Koch), and as ornamental plants (POWO, 2026). According to the Flora of Java vol. III, two species, *F. foetida* and *F. tuberosa* (Mill.) W.T.Aiton, were introduced to Java during the Dutch colonial era for ornamental purposes and fibre crop. These species were previously known only from cultivation (Backer & Bakhuizen van den Brink, 1968; Amrulloh & Widodo, 2022). However, during a botanical survey in West Java, a naturalized population of *F. foetida* was found in Jatinangor, Sumedang. Here, I formally report the occurrence of naturalized *F. foetida* in Java.

MATERIALS AND METHODS

Fieldwork on alien flora was carried out from 2025 to 2026 at several sites across West Java (Bandung, Bogor, Cirebon, Pangandaran, and Sumedang). Plant materials were collected following the Royal Botanic Garden Edinburgh (2017). The collected specimens were preserved and deposited in the Herbarium Bandungense (FIPIA), SITH, ITB. Preservation method following Bridson & Forman (1998). Species identification was conducted using taxonomic references, including Backer & Bakhuizen van den Brink (1968), Chen *et al*. (2015), Crouch & Smith (2011), and Verloove *et al*. (2019).

RESULT AND DISCUSSION

***Furcraea foetida* (L.) Haw.,** Syn. Pl. Succ.: 78 (1812); Backer & Bakh. v/d Brink.f., Fl. Java III: 165 (1968). *Agave foetida* L., Sp. Pl.: 323 (1753). *Aloe foetida* (L.) Crantz, Inst. Rei Herb. 1: 466 (1766). (Figures 1–3)

Agave bulbosa W.Bull, Nursery Cat. (William Bull) 60: 3 (1871).
Agave commelyni Salm-Dyck, Hort. Dyck.: 301 (1834).
Agave gigantea (Vent.) D.Dietr., Syn. Plant. 2: 1192 (1840).
Agave madagascariensis (Haw.) Salm-Dyck, Index Pl. Succ. Hort. Dyck.: 1 (1822).
Funium piliferum P.Willemet, Ann. Bot. (Usteri) 18: 26 (1798).
Furcraea atroviridis Jacobi & Goeff., Vers. Syst. Ord. Agav.: 273 (1871).
Furcraea barillettii Jacobi, Abh. Schles. Ges. Vaterl. Cult., Abth. Naturwiss. 1869: 166 (1869).
Furcraea cabuya var. *integra* Trel., Ann. Jard. Bot. Buitenzorg, Suppl. 3: 907 (1910).
Furcraea commelyni (Salm-Dyck) Kunth, Enum. Pl. 5: 842 (1850).
Furcraea gigantea Vent., Bull. Sci. Soc. Philom. Paris 1: 65 (1793); Backer & Bakh. v/d Brink.f., Fl. Java III: 165 (1968).
Furcraea gigantea var. *mediopicta* Trel., L.H.Bailey, Stand. Cycl. Hort. 3: 1306 (1915).
Furcraea madagascariensis Haw., Suppl. Pl. Succ.: 42 (1819).
Furcraea viridis Hemsl., Biol. Centr.-Amer., Bot. 3: 353 (1884).
Furcraea watsoniana Sander, Gard. Chron., ser. 3, 23: 242 (1898).

Large herbs, up to 3 m in height. *Stem* superterraneous, short, thick, white inside. *Leaves* densely crowded, foetid; sheath white, margin entire; blade linear-lanceolate, canaliculate, succulent, lower part up to 5.5 cm thick, tough fibrous, 54–260 × 6–19 cm, margin spinulose in the lower part, entire in juvenile, apex apiculate for ca. 5 mm long in adult leaves; adaxial surface glossy green, abaxial surface rough in the middle; cutilcle layer white, with a plastic-like texture; marginal spines upcurved, apically yellow or reddish brown, 2–9 mm long (including the broadened base). *Flowers* and *fruits* not seen. *Bulbils* ca. 6.5 cm long, ca. 2.3 cm in diam.; bracts broadly ovate, papery, brown; leaves fleshy, curved dark green.

Note. During the field study, we did not observe any generative organs. However, a description of the flowers is provided by Backer & Bakhuizen van den Brink (1968: 165).
Specimens examined. INDONESIA. JAVA — **West Java**: Sumedang Regency, Jatinangor,

Hegarmanah village, Jl. Raya Cirebon-Bandung, 19.VIII.2026, *ASD Irsyam 1344–1349* (FIPIA!); Padjadjaran University, cultivated in a garden near the DAMRI bus terminal, 24.X.2018, *ASD Irsyam 168* (FIPIA!).

The genus *Furcraea* tends to become naturalized outside its native range in suitable habitats (Verloove *et al*., 2019). Among the study areas surveyed in West Java, spontaneous *F. foetida* was found only in Jatinangor, Sumedang. The naturalized population occurred in dry, open habitats, including grassy fields (Figures 1A–B), soil cliff edges (Figure 1C), areas beneath bamboo stands (Figures 1D–E), and abandoned sites along roadsides (Figure 1F), at an elevation of 745–767 m a.s.l. A total of 63 individuals were observed along a 508 m stretch, comprising 31 adult plants and 32 juveniles. No flowering plants were observed during the field survey.

Furcraea foetida produces numerous bulbils, with each inflorescence potentially bearing several thousand plantlets (Figure 3). Following flowering, these viviparous propagules detach from the inflorescence and readily root upon contact with the soil, allowing them to develop into dense, monotypic stands. This prolific vegetative reproductive strategy may facilitate the establishment and persistence of naturalized populations beyond cultivation (Crouch & Smith, 2011). The presence of numerous juveniles at the study site, despite the absence of flowering plants, may therefore indicate that vegetative propagation has contributed to the establishment of the population. In addition, Crouch & Smith (2011) reported that longer-distance dispersal of bulbils may be facilitated by human activities, while these viviparous propagules readily root upon contact with the soil and can form dense monotypic stands. The occurrence of *F. foetida* along roadsides and in abandoned areas may therefore indicate that human-mediated dispersal contributed to its introduction and subsequent naturalization in Jatinangor.

Outside Indonesia, the species has been reported as naturalized and considered invasive in many regions, including the Seychelles, Madagascar, the Mascarene Islands (Baker, 1888; Drummond, 1907; Macdonald *et al*., 1991), the Marquesas Islands, Cook Islands, Fiji, Guam, French Polynesia, Hawaii, Tonga, New Caledonia, Australia (Forster, 1986), New Zealand, and South Africa (Crouch & Smith, 2011), as well as Brazil (Barbosa *et al*., 2017) and the Canary Islands (Verloove *et al*., 2019). Based on observations at the newly recorded locality, it is too early to conclude whether *F. foetida* will become invasive in Java. Zulkarnaen *et al*. (2024) identified *F. foetida* among 78 potentially invasive plant species recorded in the Bogor Botanic Gardens, where five individuals were documented at the ex situ conservation site. The occurrence of a spontaneous population in Jatinangor highlights the need for continued monitoring and further assessment of its distribution, reproductive capacity, and spread to evaluate its potential to become invasive in Java.

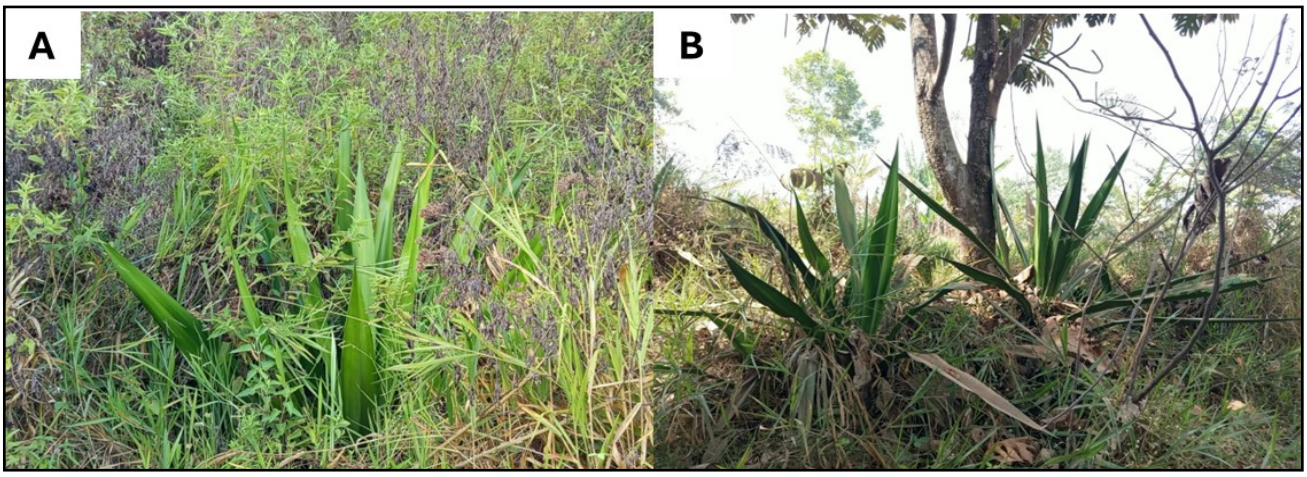


Figure 1. Naturalized population of *F. foetida* in Hegarmanah Village, Jatinangor, Sumedang, showing adult plants (A–F) and juvenile plants (G–I) in various habitat types.

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Figure 1. Naturalized population of *F. foetida* in Hegarmanah Village, Jatinangor, Sumedang, showing adult plants (A–F) and juvenile plants (G–I) in various habitat types. (*continue*)

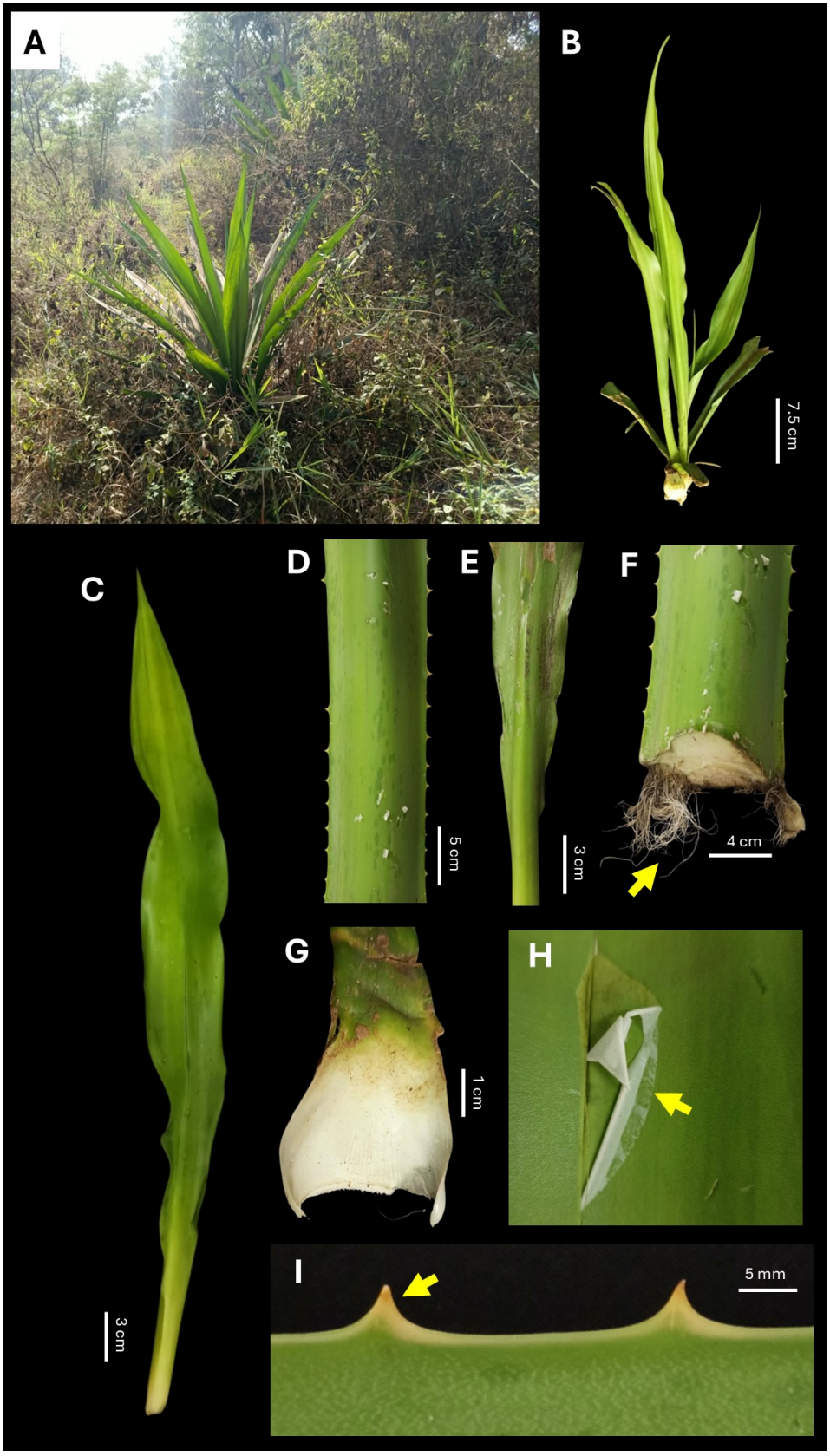


Figure 2. *Furcraea foetida* (L.) Haw. A. Habit of an adult plant, B. Habit of a juvenile plant, C. Leaf shape of a juvenile plant, D. Spiny lower margin of an adult leaf, E. Spineless lower margin of a juvenile leaf, F. Leaf fibres (arrow), G. Leaf sheath of a juvenile plant, H. Cuticle (arrow), I. Marginal spines (arrow) and rough surface on the abaxial side of the leaf.

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Figure 3. Wet specimen of *F. foetida* bulbils (*ASD Irsyam 168*, 2018) collected from a cultivated plant.

ACKNOWLEDGMENTS

The author would like to thank Mr. Mulyana for his kind assistance during field observation in the sand truck staging area at Hegarmanah.

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