DOI : 10.32556/floribunda.v7i3.2023.3533
P-ISSN : 0215 - 4706
E-ISSN : 2460 - 6944

FLORIBUNDA
Jurnal Sistematika Tumbuhan

EPISTOLA BOTANICA

MAYACACEAE IN INDONESIA: AN ALIEN FAMILY ESCAPED FROM CULTIVATION

Mayacaceae Kunth is a monogeneric family with a single genus, *Mayaca* Aubl. The members of this family are herbs that are found in swamps, lakes, and rivers. The family is distributed throughout the Neotropics, except for *M. baumii* Gürke, which is only found in Africa [de Carvalho MLS & Machado AFP., *Revisiting Mayacaceae Kunth towards to future perspectives in the family*, *Rodriguésia* 66(2): 421-427. 2015]. Mayacaceae consists of ten species and one of them, *Mayaca fluviatilis* Aubl. is widely cultivated as an aquascape ornamental plant, including in Indonesia. This aquatic family is not yet recorded in the Flora of Java Vol. III [Backer CA & Bakhuizen van den Brink RC., *Flora of Java*, Vol. III, Groningen: NVP Noordhoff. 1968].

Botanical exploration was conducted in Jakarta and West Java from October 2022 to October 2023 as part of the Alien Species Inventory Project. During the field observation, two spontaneous populations of *M. fluviatilis* were discovered in the Jatinangor Subdistrict, Sumedang Regency, West Java. The first population was found on the ITB Jatinangor campus, and the second was located in Cikeruh village. This report presents a brief discussion, description, and photographs of the findings.

***Mayaca fluviatilis* Aubl.**, Hist. pl. Guiane 1: 42, t 15. 1775; *Syena fluviatilis* (Aubl.) Willd., Sp. Pl., ed. 4, 1: 254. 1797. (Figure 1)

Coletia madida Vell., Fl. Flumin.: 32. 1829; *Mayaca madida* (Vell.) Stellfeld in Tribuna Farm. (Curitiba) 35: 2. 1967.

Herb, submerged. Stems heavily branched and matted, decumbent to erect, 80–220 cm tall, but usually much longer, green, upper stem white. Leaves simple, spiral, sessile; lamina narrowly lanceolate to linear, 6–21 mm × 0.5 mm, margin entire, apex bifid, dark green, young leaves pale green. Flower axillary, solitary on short pedicel, actinomorphic, perfect, hypogynous, trimerous, strongly differentiated calyx and corolla; sepals 3, equal, free, green, valvate; petals 3, equal free, white, imbricate; stamens 3, alternate with the petals; filaments slender, glabrous; anthers basifixed, opening by apical pores. Ovary unilocular; style simple, terminal; stigma short capitate.

Distribution: Native to Bolivia, Uruguay, and Argentina [de Mello Canalli Y, Moreira ADR & Bove CP., *Flora do Rio de Janeiro: Mayacaceae*, *Rodriguésia* 68(1): 073-075. 2017].

Habitat: In its native habitat, the species grows in marshes, springs, ponds, pools, streams, and coastal plain margins. In this study, the wild populations of *M. fluviatilis* grew in artificial lakes at 700 m asl.

Examined specimens: JAKARTA: East Jakarta City, Jatinegara, Bali Mester, 19.VIII.2023, *MR Hariri, ASD Irsyam, MH Fadhil s.n.* (FIPIA). WEST JAVA: Sumedang Regency, Jatinangor Subdistrict, ITB campus area, Danau Pendidikan Situ II, 8.X.2022, *MR Hariri & ASD Irsyam ASP05* (FIPIA); Sumedang Regency, Jatinangor Subdistrict, Cikeruh Village, 13.X.2022, *MR Hariri & ASD Irsyam ASP06* (FIPIA); Bogor Regency, Dramaga Subdistrict, Ciherang, Jl. Bojong Sari, 27.V.2023, *MR Hariri, ASD Irsyam, MH Fadhil MRH 356* (FIPIA).

The specimen collected from Jatinangor was discovered in its submerged vegetative phase (Figure 1). Previous studies showed that *M. fluviatilis* has solitary and bisexual flowers with a pink or purplish corolla and trimerous stamen. Fruits are capsules 3–5 × 3–5 mm in size [de Mello Canalli Y, Moreira ADR & Bove CP., *Flora do Rio de Janeiro: Mayacaceae*, *Rodriguésia* 68 (1): 073-075. 2017; Niissalo MA & Leong-Škorničková J., *Mayaca fluviatilis* Aubl. *(Mayacaceae), a new record of a naturalised aquatic monocotyledon in Singapore*, *Nature in Singapore* 12: 7-9. 2019].

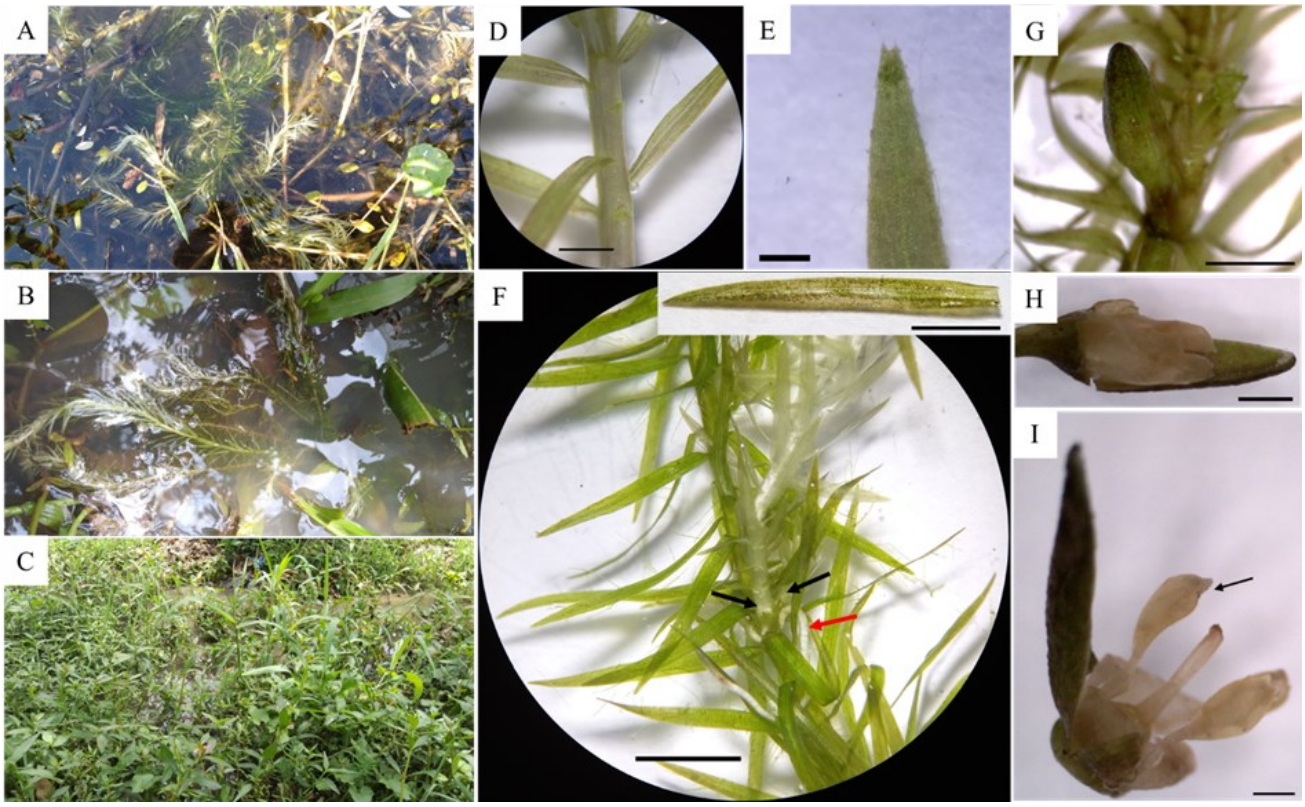

Figure 1. *Mayaca fluviatilis* Aubl. A=specimen found in Danau Pendidikan Situ II, ITB Jatinangor; B=specimen found in Danau Cikeruh Village; C=habitat of those in Danau Cikeruh Village; D=phyllotaxis (bar=3 mm); E=bifid apex (bar=0.3 mm); F=stem with some buds (black arrow), roots (red arrow) (bar=3 mm), and lamina shape (bar=0.3 mm); G=flower bud (bar=2 mm); H=opened *Mayaca* flower (sepal artificially removed, bar=1 mm); I=artificially opened *Mayaca* flower showing stamen with terminal pore (sepal and petal artificially removed, bar=0.5 mm).

The observation of flowers has been limited to the submerged stems of the species. The floral structures exhibit diminutive dimensions, measuring approximately 10 mm in diameter. The perianth, which encloses the reproductive organs, is characterized by its transparent physical form. Furthermore, the perianth is composed of three distinct segments, following a trimerous pattern, with discernible differentiations between the petals and sepals. *Mayaca fluviatilis* exhibits anther characteristics that are worth noting. Specifically, the anthers of this species possess terminal pores that do not protrude from the anther by more than 0.1 mm. This particular arrangement creates a crevice-like appearance. It is interesting to observe that other *Mayaca* species have pores that are extended by marginal flaps, resulting in a tubular shape (Figure 1.I and 2) [Stevenson DW., *Mayacaceae*. In: Kubitzki, K. (eds) *Flowering Plants Monocotyledons. The Families and Genera of Vascular Plants*, vol 4. 1998. Springer, Berlin, Heidelberg; Niissalo MA & Leong-Škorničková J., *Mayaca fluviatilis* Aubl. *(Mayacaceae), a new record of a naturalised aquatic monocotyledon in Singapore*, *Nature in Singapore* 12: 7-9. 2019].

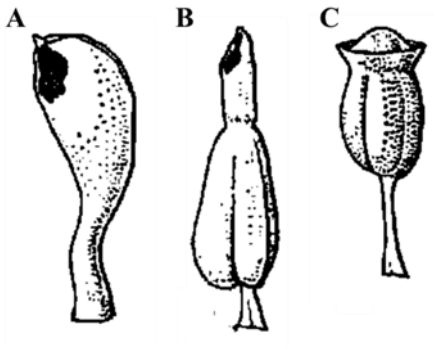

Figure 2. Shape variation on stamen in *Mayaca* Aubl. A=*Mayaca fluviatilis* Aubl.; B= *Mayaca sellowiana* Kunth; and C=*Mayaca baumii* Gürke (Stevenson DW., *Mayacaceae*. In: Kubitzki, K. (eds) *Flowering Plants Monocotyledons. The Families and Genera of Vascular Plants*, vol 4. 1998. Springer, Berlin, Heidelberg).

The observed *M. fluviatilis* population was assumed to be in its initial stages of development. The species may have escaped from an aquascape breeding culture. Submerged plants most likely produced buds and spread quickly due to fragmentation. Manual removal could have promoted their spread [Yakandawala K & Dassayanake DMGS., *Mayaca fluviatilis* Aubl*.: an ornamental aquatic with invasive potential in Sri Lanka*, *Hydrobiologia* 656(1):199-204. 2010]. *Mayaca fluviatilis* grows in the same habitat as *Hydrilla verticillata* (L.f.) Royle at Danau Pendidikan Situ II, ITB Jatinangor Campus. Both species differ in the presence of teeth on the leaf margin, while *Mayaca fluviatilis* lacks of teeth character (Figure 1-F).

As a point of interest, *M. fluviatilis* is traded in the Indonesian aquascape market. We also collected traded individuals from East Jakarta City (Jatinegara) and Bogor Regency (Dramaga). The occurrence of *M. fluviatilis* outside its native distributional area has also been reported from Sri Lanka [Yakandawala K & Dassayanake DMGS., *Mayaca fluviatilis* Aubl*.: an ornamental aquatic with invasive potential in Sri Lanka*, *Hydrobiologia* 656(1):199-204. 2010], China [Su F, Guo YN, Zhou XX, & Wang RJ., *Mayacaceae, a newly naturalized family for the Flora of China*, *Phytotaxa* 447(1): 77-80. 2020], and Singapore [Niissalo MA & Leong-Škorničková J., *Mayaca fluviatilis* Aubl*. (Mayacaceae), a new record of a naturalised aquatic monocotyledon in Singapore*, *Nature in Singapore* 12: 7-9. 2019].

— **Muhammad Rifqi Hariri** (Research Center for Biosystematics and Evolution, BRIN, Cibinong), **Muhammad Hisyam Fadhil** (Department of Agronomy and Horticulture, Faculty of Agriculture, IPB University), **Arifin Surya Dwipa Irsyam**, **Dian Rosleine**, & **Rina Ratnasih Irwanto** (Herbarium Bandungense, School of Life Sciences and Technology, ITB, Bandung)