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A NEW RECORD OF EUPHORBIACEAE WEEDS FOR PENINSULAR MALAYSIA

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ABSTRACT
RAFIDAH, A. R. & NIK FAIZU, N. H. 2023. A new record of Euphorbiaceae weeds for Peninsular Malaysia. *Reinwardtia* 22(1): 27–30. — *Caperonia* A.St.-Hil. is a new genus record for Peninsular Malaysia, with the species of *Caperonia palustris* (L.) A.St.-Hil. This paper will provide a description, distribution, habitat, and colour plates of the species.

Key words: Flora, naturalized species, Peninsular Malaysia, taxonomy.

ABSTRAK
RAFIDAH, A. R. & NIK FAIZU, N. H. 2023. Rekaman baru gulma Euphorbiaceae untuk Semenanjung Malaysia. *Reinwardtia* 22(1): 27–30. — *Caperonia* A.St.-Hil. merupakan rekaman marga baru di Semenanjung Malaysia, dengan jenis *Caperonia palustris* (L.) A.St.-Hil. Deskripsi, sebaran, habitat dan foto berwarna jenis ini disertakan.

Kata kunci: Flora, jenis ternaturalisasi, Semenanjung Malaysia, taksonomi.

INTRODUCTION

Weeds are often overlooked, ignored or misidentified. As weeds become established and later reproduced, they are considered naturalized and become part of the flora. Some weeds are widespread and they grow aggressively and later become noxious weeds (Kiew, 2009). The majority of the most common and widespread weed species we know have become as a consequence of crop domestication, planting and cultivation (Dekker, 2016).

Caperonia A.St.-Hil. (Euphorbiaceae) is a new genus record for Malaysia. *Caperonia palustris* (L.) A.St.-Hil., is native to Central and South America and was first reported as a new record in Java, Indonesia in 2019 (Anshori *et al*., 2020) where it grew as a weed along rice fields. According to Anshori *et al*. (2020), the species may have been accidentally introduced into Java as a soil contaminant, but the time and vector of introduction are uncertain. In Peninsular Malaysia, *Caperonia palustris* was encountered recently in rice fields in Perak and Selangor. At first, the species might be confused with *Croton* species, but after further examination and detailed study of the morphology, it was confirmed that the collected species is *Caperonia palustris*. The species was not recorded in Moody (1989), Turner (1997), or in the weed diversity of Sebarang Perak, Malaysia (Hakim *et al*., 2013). Hence, it is reported here as an additional new record for the Flora of Peninsular Malaysia.

Caperonia palustris has been described as an invasive alien species of rice fields in southern United States since 2007 where it is called as Texas weed (Miller *et al*., 2010; Godara *et al*., 2011) and is one of the most troublesome weeds in the Texas and Louisiana rice growing areas (Godara *et al*., 2012). The seeds are dispersed by water and both Koger *et al*. (2004) and Godara *et al*. (2012) showed that the seeds have a capability to survive under flooded conditions. Permanent flood establishment is an important cultural practice for weed management in rice crops (Bouman *et al*., 2007). However, in Malaysia, the method of rice establishment changed to direct seeding in the 1980's that provides aerobic conditions for weeds because they are not flooded during the initial growth stages of the crop (Karim *et al*., 2004). Flooding can affect both weed emergence and growth (Godara *et al*., 2011). Therefore, more adapted weeds can compete to grow for light, water and nutrients, which may cause losses in rice yields. The composition of weed species assemblages in rice fields is rapidly changing due to factors such as the increasing use of herbicides, changes in ploughing and fertilizer practices, cropping systems, and also environmental change by the creation of well-drained rice fields (Kosaka *et al*., 2006).

Fig. 1. *Caperonia palustris*. A-B. Habit. C. Staminate flowers (lowest position of inflorescence), young buds (centre) and pistillate flowers (at the top). D. Top view of fruits (left) and pistillate flowers with white sepals (right). E. Side view of fruits with the green persistent sepals. F. Persistent sepals of pistillate flowers (left and centre) and top view of fruit (right). Scale: 5 mm for C, D, E, F.

Euphorbiaceae is one of the largest, most complex and diverse families of angiosperms and are distributed mainly in the tropics, in various vegetation types and habitats. The family comprises 225 genera and more than 6,300 species in the world (Challen, 2015). Euphorbiaceae consists of 81 genera in the Flora Malesiana region (van Welzen, 2020). Now that *Caperonia palustris* is an addition to the Flora of Peninsular Malaysia, the description, distribution and habitat are provided in detail here.

MATERIALS AND METHODS

Field survey was carried out in 2019 and 2021. Flowering and fruiting specimens were collected, examined and preserved using the standard herbarium technique of Bridson & Foreman (1998) and deposited in the KEP Herbarium of Forest Research Institute Malaysia (FRIM). The morphological descriptions of this species was based on the examination of the fresh plants.

TAXONOMIC TREATMENT

CAPERONIA PALUSTRIS (L.) A.St.-Hil., Hist. Pl. Remarq. Bresil 3/4: 245. 1825; Anshori *et al.*, J. Trop. Biol. Conserv. 17: 273. 2020. **Basionym:** *Croton palustris* L., Sp. Pl. 2: 1004. 1753 ('*palustre*').

Herb to sub-shrub, woody at base, monoecious, erect, to 50–60 cm in height, with milky latex. *Stems* green, erect, cylindrical, ridged, hollow, with or without glandular hairs. Stipules triangular to lanceolate or subulate, 2–5 × *ca*. 1 mm, caducous. *Leaves* simple, alternate; petioles green, slender, up to 15 mm long, glandular hairs present; lamina ovate, elliptic to oblong, 4–10 × 2–5 cm, base rounded to acute, margin serrate, with glands on leaf teeth, apex acute or acuminate; midrib prominent beneath, sparsely hairy, secondary venation 8–12 pairs, pinnate, trinerved at base; tertiary venation conspicuous. *Inflorescences* racemose thyrse, axillary, up to 1 cm long; flowers unisexual, 1–4 proximal pistillate flowers, several distal staminate flowers; peduncles 2–4 cm long, hispid; bracteoles ovate, *ca.* 1 mm long. *Staminate flowers*: *ca*. 1.5 mm diameter; pedicel *ca.* 1 mm long; sepals green, 5, united at base, ovate-elliptic, *ca.* 1.5 × 0.4 mm; petals white, 5, free, obovate-oblong, *ca.* 3.5–2 × 1.5–2 mm long, clawed, disc absent; stamens 10, filament length unequal, whitish cream, united near the base into a column, free distally, filiform, anthers yellowish, oblong; pistillode present, minute, cylindrical. *Pistillate flowers*: 1.5–2 mm diameter, sub-sessile to sessile; sepals 5, united at base, ovate, unequal, in two rows, 3 inner larger, 3–5 × *ca.* 1 mm, 3 outer smaller, 1.5–2 × *ca.* 1 mm, persistent in fruit; petals 5, white, free, oblong-lanceolate; staminodes and disc absent; ovary green, superior, trilocular with 1 ovule per locule, glandular hairs present, style short, stigma white, greenish at base, bifurcate. *Fruits* subsessile, a trilocular capsule, deltoid at shape, 4–6 mm diameter, pilate glandular; persistent sepals 5–6, ovate to deltoid, *ca.* 5 × 3 mm. *Seeds* 3, brown, globose, *ca.* 2 mm diameter, ecarunculate.

Distribution. Native to Central and South America. The species is present in tropical and subtropical America, and in the south of the USA (Texas, Arkansas, and Mississippi). It is common in tropical Africa, South Africa and Madagascar. In Malesia, it is reported as naturalized from Bogor (West Java) and Rembang (Central Java) (Anshori *et al*., 2020). In Peninsular Malaysia, it is recorded in Perak and Selangor.

Habitat and ecology. The species can be found in ditches, rice fields along the canals and roadsides. In Bogor and Rembang, the species grows as a weed along rice fields and according to Anshori *et al*. (2020), the seeds are dispersed by water. A previous study showed that the seeds have a capability to survive under flooded conditions (Koger *et al*., 2004).

Specimens examined. PENINSULAR MALAYSIA: Perak, Hilir Perak, Chenderong Balai, 14 July 2019, *Rafidah & Nik Faizu FRI 93110* (KEP); PENINSULAR MALAYSIA: Perak, Kg Changkat Budiman, 15 October 2021, *Rafidah & Nik Faizu FRI 97360* (KEP); PENINSULAR MALAYSIA: Selangor, Sg. Besar, Pasar Jerami, 14 October 2021, *Rafidah & Nik Faizu FRI 97361* (KEP).

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