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PEPLIDIUM (SCROPHULARIACEAE): A NEW GENERIC RECORD FOR THE FLORA OF TROPICAL EAST AFRICA

Iain Darbyshire
Royal Botanic Gardens, Kew
Richmond, Surrey TW9 3AB, UK
i.darbyshire@rbgkew.org.uk

Quentin Luke
East African Herbarium, National Museums of Kenya
P.O. Box 40658, Nairobi, Kenya
Centre for Tropical Plant Conservation, Fairchild Tropical Botanic Garden
11935 Old Cutler Road, Coral Gables, FL 33156-4242, USA
quentin.luke@swiftkenya.com

Kaj Vollesen
Royal Botanic Gardens, Kew
Richmond, Surrey TW9 3AB, UK
k.vollesen@rbgkew.org.uk

ABSTRACT

Two specimens of *Peplidium maritimum* (L.f.) Asch. (Scrophulariaceae / Phrymaceae) are recorded from the Indian Ocean coastline of Kenya, representing the first record of this species and genus for the Flora of Tropical East Africa. The generic key for the Flora volume is revised to accommodate this addition and a description is provided, together with notes on its distribution, habitat requirements and conservation status. The first Kenyan records of *Limnophila indica* (L.) Druce and *Lindernia zanzibarica* Eb.Fisch. & Hepper are also noted.

Keywords: *Peplidium maritimum*, *Limnophila indica*, *Lindernia zanzibarica*, aquatic, Kenya, Lamu District, Tana District, generic key

INTRODUCTION

During botanical fieldwork in coastal Kenya in July 2006, for the project "*Plant Conservation Assessment in the Eastern Arc Mountains and Coastal Forests Biodiversity Hotspot of Tanzania and Kenya*" (CEPF, 2003), one of the authors (QL), together with Lenin Festo (National Herbarium of Tanzania), collected two specimens of a tiny aquatic herb belonging to the Scrophulariaceae family (*sensu lato*). Subsequent attempts to identify the herbarium specimens using the Flora of Tropical East Africa (F.T.E.A.) treatment for this family (Ghazanfar *et al*., 2008) proved unsuccessful. Following more thorough literature

and herbarium research, the taxon was identified as *Peplidium maritimum* (L.f.) Asch., a new species and generic record for the F.T.E.A. region.

Peplidium maritimum has previously been recorded from Egypt, Iraq, India, Sri Lanka, Malesia and Australia (Barker, 1992), and recently from Madagascar (E. Fischer, *pers. comm.*). Boulos (2002) recorded it as occuring in "tropical and subtropical Africa and Asia"; however, we have been unable to find any previous tropical African records. The first Kenyan specimen was collected from shallow freshwater pools behind coastal sand dunes, together with *Acalypha* sp.; *Cyperus difformis* L.; *Enicostema axillare* (Lam.) A.Raynal subsp. *axillare*; *Ipomoea sepiaria* Roxb.; *Kohautia virgata* (Willd.) Bremek.; *Ludwigia perennis* L.; *Nymphaea nouchali* Burm.f. var. *caerulea* (Savigny) Verdc. and *Tephrosia linearis* (Willd.) Pers. The second collection was made from a sandy tidal creek in brackish water where it was growing with *Aeschynomene* sp. B of F.T.E.A.; *Ascolepis pusilla* Ridl.; *Bacopa floribunda* (R.Br.) Wettst.; *Cyperus* spp.; *Eleocharis acutangula* (Roxb.) Schult.; *Fimbristylis dichotoma* (L.) Vahl; *F. polytrichoides* (Retz.) R.Br.; *Hypertelis bowkeriana* Sond.; *Indigofera lobata* J.B.Gillett; *Ipomoea coptica* (L.) Roem. & Schult. var. *acuta* Choisy; *Lindernia zanzibarica* Eb.Fisch. & Hepper; *Lipocarpha* spp.; *Marsilea* sp.; *Nesaea radicans* Guill. & Perr. var. *floribunda* (Sond.) A.Fern.; *Schoenoplectus articulatus* (L.) Palla; *Sphaeranthus spathulatus* Peter; *Vahlia dichotoma* (Murray) Kuntze and *Xyris anceps* Lam. Elsewhere within its range, *P. maritimum* has been recorded from ephemeral freshwater sites such as ditches and rice fields (Boulos, 2002) and from saline tidal mud flats (Singh, 1978; Barker, 1992). As it is a highly inconspicuous and ephemeral annual, it is easily overlooked and thus probably more widespread within its range; for example, it is very likely to occur in suitable habitat in coastal Somalia.

In addition to this widespread species, the genus *Peplidium* Delile contains six species endemic to Australia (Barker, 1992; Mabberley, 2008). Molecular evidence demonstrates that the Scrophulariaceae *sensu lato* are polyphyletic, and should be divided into several distinct (but morphologically close) families (*e.g.* Rahmanzadeh *et al.*, 2005; Tank *et al.*, 2006). Following the arrangement of the Angiosperm Phylogeny Group (Stevens, 2008), *Peplidium* falls within the family Phrymaceae Schauer, and recent molecular data from Australia indicates that *Peplidium* is derived from within *Mimulus* L., the largest genus within the Phrymaceae (Beardsley & Barker, 2005; Tank *et al.*, 2006).

Also collected during this work from the same area of Kenya (K7) were *Limnophila indica* (L.) Druce (*Festo & Luke* 2566) and *Lindernia zanzibarica* Eb.Fisch. & Hepper (*Festo & Luke* 2576), two further species of Scrophulariaceae *sensu lato*, neither of which have previously been recorded in Kenya (*fide* Ghazanfar *et al.*, 2008).

TAXONOMIC TREATMENT

In order to incorporate *Peplidium* within the F.T.E.A. key to genera of Scrophulariaceae (Ghazanfar *et al.*, 2008), the following modifications can be applied. Where the original leads have been altered or new information added, this is treated in bold. Leads 10–12 deal with the aquatic taxa of Scrophulariaceae; *Peplidium* is therefore compared only to the aquatic species of *Veronica* in the newly added couplet 12a: in the F.T.E.A. region these are *V. anagallis-aquatica* L. and *V. javanica* Blume:

10 Leaves of two types; submerged leaves finely divided, aerial leaves undivided, deeply lobed or variously divided…… 16. ***Limnophila***

Leaves of one type.....11
11 Stems ± fleshy, **erect**; corolla bilabiate; calyx deeply 5-fid; fertile stamens 2, anterior stamens reduced to staminodes..... 19. ***Dopatrium***
Stems not fleshy; corolla regular **or if bilabiate then stems floating or creeping and calyx tubular, shallowly 5-fid**; fertile stamens 4 or 2, staminodes absent 12
12 **Stamens 4**.....25. ***Limosella***
Stamens 2..... 12a
12a Flowers solitary and subsessile in leaf axils; corolla 5-lobed, weakly bilabiate; calyx tubular, apex shallowly and obtusely 5-lobed.....24a. ***Peplidium***
Flowers held in lateral racemes; corolla 4- (rarely 5-) lobed, rotate or campanulate, not bilabiate; calyx deeply divided into 4 (–5) oblong lobes ..... 28. ***Veronica***

Peplidium maritimum *(L.f.) Asch.* in Schweinf., Beitr. Fl. Aethiop.: 275 (1867); Wettst. in Engl. Nat. Pflanzenfam. IV, 3b: 78 (1895); Gamble in Fl. Madras 2: 963 (1924); Singh in J. Bombay Nat. Hist. Soc. 74: 390 (1978); Cramer in Dassan. & Fosb., Rev. Handb. Fl. Ceylon 3: 435 (1981); Rani & Matthew in Fl. Tamilnadu Carnatic, pt. II, Gamopetalae & Monochlamydeae: 1099, pl. 78j (1983); Boulos, Fl. Egypt 3: 77 (2002). Type: "India orientale", *König* s.n. (?C, holo., n.v.)

Floating-aquatic or *creeping paludal, annual herb*, rooting at nodes in terrestrial plants; glabrous. *Leaves* opposite, obovate, elliptic or suborbicular, to 10–18 × 6–8 mm, base attenuate from short petiole, margin entire, apex rounded, surfaces glandular-punctate; petioles of opposite pairs connected by a membranous ridge across the node. *Flowers* axillary, solitary, subsessile, ebracteolate. *Calyx* tubular, c. 2–3 mm long, 5-ribbed, apex shallowly and obtusely 5-lobed, persistent and somewhat accrescent in fruit. Corolla purplish, barely extending beyond calyx, c. 3.5 mm long, weakly bilabiate, upper lip 2-lobed, lower lip 3-lobed, lobes rounded. *Stamens* 2; filaments flattened, broadened towards base; anthers yellow, unilocular. *Stigma* with broad, flattened lobe. *Capsule* ovoid, tardily and irregularly dehiscent, rupturing at the base. Seeds numerous, oblong, angular.

KENYA. Tana River District: Nairobi Ranch, 2°30'S, 40°39'E, alt. 3 m, fl. & fr. 14 July 2006, *Festo & Luke* 2368 (EA, K, MO, NHT); Lamu District: Hindi to Kililani, 2°12'S, 40°54'E, alt. 2 m, fl. 22 July 2006, *Festo & Luke* 2586 (EA, MO, NHT).

DISTR. **K** 7; Egypt, Iraq, India, Sri Lanka, Australia, Madagascar.

HAB. Floating aquatic in shallow freshwater wetlands behind coastal sand dunes and in brackish sandy tidal creeks.

SYN. *Hedyotis maritima* L.f., Suppl. Pl. 119 (1782).
Peplidium humifusum Delile, Fl. Egypte: 148 (1814). Type: Egypt, rizieres de Damiette, *Delile* s.n. (MPU!, holo.)

CONSERVATION NOTES. Although rather rarely collected for herbaria, *P. maritimum* is very widespread and almost certainly under-recorded as it is highly inconspicuous and favours ephemeral wetland habitats. It is not considered threatened and is assessed as of Least Concern (**LC**) using the categories and criteria of IUCN (2001).

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