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Research

A new species of *Emilia* (Asteraceae, Senecioneae) from Lower Juba region, Somalia

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Emilia corallina is described as a new species endemic to the coastal area of southern Somalia close to the Kenyan border. It is closely related to *E. bellioides*, the only other species of the genus given for the Flora of Somalia. This narrow endemic grows in coastal dunes and madreporic limestone outcrops along the lower Juba coast and is reported at present only around the area south of Chisimaio.

Keywords: Asteraceae, *Emilia*, new species, Somalia



The genus *Emilia* Cass. counts around 100 species, 117 according to POWO (2021), distributed in Tropical Africa and Asia (Tadesse and Beentje 2004, Jeffrey and Beentje 2005, Thulin 2006).

Working up an unidentified part of some collections from the Horn of Africa region made by R. Bavazzano in 1973 and housed at the Centro Studi Erbario Tropicale (Herbarium FT) of the University of Florence, some specimens of *Emilia* from southernmost Somalia were found which diverged from the only species known in this genus in the area and which could not be identified with the available literature (Jeffrey and Beentje 2005, Thulin 2006). Morphological investigation of the unidentified material and comparison with the known members of *Emilia* showed it to represent an undescribed taxon, which is described here.

Area of study

The coast between the Juba River and the border of Kenya is little known from a geobotanical point of view. Apart from Chiovenda's notes in his Flora Somala (1929, 1932, 1936), the only other contribution is by Ciferri (1939) on the coasts and dunes of Benadir.

Much of the information from coastal southern Somalia comes from studies which took place in 1970–1980 (Pardi 1976a, b, 1977, Sartoni 1976, Messina et al. 1977, Vannini et al. 1977, Chelazzi and Ferrara 1978, Moggi 1987), sponsored by the 'Centro di Studio per la Faunistica ed Ecologia Tropicali' of the Consiglio Nazionale delle Ricerche (C.N.R.), Firenze. Additional information on the dune vegetation were provided by Pichi Sermolli (1957) and Friis and Vollesen (1989).



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Other information is given by Birch (1963) and Sauer (1965); both these studies are limited to southern Kenya but point out some affinities with the coastal vegetation of southern Somalia.

An annotated checklist is available for the coastal forests of Kenya (Ngumbau et al. 2020).

Material and methods

The materials for this study come from different collections made in the area of study between 1971 and 1975 by FT herbarium staff.

Some specimens were still unidentified while others were found among specimens of *E. bellioides* or as Asteraceae sp. in FT herbarium.

Photos of minute macroscopic characters were recorded with the digital camera mounted on a stereoscope.

Emilia corallina Baldesi, sp. nov. (Fig. 1–2)

Typus: Somalia, Oltregiuba, Sar Uanle, Chisimaio [Kysmaayo], duna litoranea verso sud (Fuma terra) [Fuma mainland], 0°37'S, 42°27'E, 11–17 Jun 1973, R. Bavazzano s.n. (holo: FT FT0007406; iso: FT FT0007436, K, UPS).

Emilia corallina sp. nov. a *E. bellioides* (Chiov.) C. Jeffrey habitu perenne, caulibus largioribus, foliis glabris (versus hispidis pubescentibusque), capitulo discoideo (versus radiato), involucre latiore (4–8 mm versus 2–4 mm), phyllariis 8 ferme glabrisque vel parum pubescentibus (versus 12–14 dense pubescentibusque) differt.

Emilia corallina is most similar to *E. bellioides* (Chiov.) C. Jeffrey but clearly distinguished from the latter species by its perennial habit, stouter stems, glabrous leaves (versus hispid and pubescent), discoid capitulum (versus radiate), larger involucre (4–8 mm versus 2–4 mm) and 8 sparsely pubescent phyllaries (versus 12–14, densely pubescent).

Presumably a short-lived perennial, 10–25 cm tall, branching from a 3–5(6) mm thick basal stem showing leaf base remnants or leaf scars along it, also branching from ground/base; stem usually erect or sometimes procumbent; internodes short, around 1–2 cm.

Leaves glaucescent and sub-succulent, sessile, glabrous, 1.0–3.0 × 0.5–3.0 cm; basal leaves few or none (in older plants), smaller to much smaller than upper leaves, spatulate to obovate, at base cuneate or attenuate into a semi-amplexicaul petioloid base, with margins entire or slightly sinuate-dentate in upper part; upper leaves many, broadly elliptic with semi-amplexicaul rounded or truncate base, margin entire or ± serrate-dentate in upper part (occasionally with mucro-like teeth), and apex rounded or with a small mucro. Capitula terminal on side branches, with several peduncles arising nearly from the same point, solitary on 2–5 cm long stalks (peduncles), discoid; involucre (5)6–10 × 4–8 mm; phyllaries 8, 5–9 × 1–3 mm basally, glabrous or sparsely pubescent and distally papillose (in some capitula 2 phyllaries apparently fused for most of their length). Florets yellow; corolla 6–8(9) mm

long; tube glabrous; lobes ca 1 mm long, minutely papillose and darker at apex. Anthers with apical appendages ca 0.5 mm. Style branches truncate with a papillose rim. Achenes 3.0–3.5 × 0.5 mm, shortly hairy (papillose), 5-ribbed, light brown and papillose all along the ribs and around the apex; pappus white, 5–6 mm long.

Eponymy

The epithet refers to this species' habit of growing on coral-line sand or on madreporic limestone; the adjective 'corallina' derives from the Latin term for coral 'corallium'.

Key to *Emilia* species in Somalia:

- 1 Annual; pubescent; capitula radiate..... *E. bellioides*
- Short-lived perennial; glabrous; capitula discoid.....
.....*E. corallina*

Ecology, distribution and affinities

Habitat: coastal dunes and madreporic limestone outcrops, 0–10 m a.s.l.

The locality of the type collection is situated in the Lower Juba coast, about 20 km south of Chisimaio and 4.5 km south of the Coangiule peninsula. In this coast section the wave action is checked by the almost continuous barrier of the madreporic Bajuni islands which delimit a channel which is around 3–4 km wide and fairly sheltered from winds, especially during the SW monsoon (Pardi 1976a).

The area south of Chisimaio presents low dunes and a rather inconsistent strip of sand followed inland on the rocky madreporic substrate by prostrate bushland (Moggi 1987).

The dunes found in this area differ from the ones in central Somalia and around Mogadishu in being less extensive, relatively small (5–10 m high rarely 20 m) and composed of white calcareous sand, produced by the abrasion of the reef (Pignatti et al. 1987). The sand granulometry is characteristic of organogenic sand in tidal beaches with medium-fine grains without any important mineralogical components (Messana et al. 1977).

The coral reef that constitutes the present coastline (coastal shelf, III in Fig. 1 in Moggi 1987) presents two different aspects: an exposed rock shelf which forms a more or less elevated rock coast, or a small terrace which is covered with sand (Moggi 1987).

According to Pignatti et al. (1987) on the coast near Chisimaio sometimes at the edge of the beach the calcareous reef appears covered on top by a layer of sand, these littoral sandy terraces on limestone are parallel to the coast and host particular vegetation types.

Emilia corallina appears to grow in both these habitats and assumes consequently different growth habit in response to the different edaphic conditions. Plants growing in madreporic sandy soil maintain a low and compact growth while individuals found more inland on rocky substrate have an elongated and stretched appearance.



Figure 1. Scan image of the holotype of *Emilia corallina* sp. nov. (FT0007406).

The species seems to grow from the dunal area and trough-out the retrodunal plane up to the rocky platform and mad-repore outcrops.

Emilia corallina was gathered together with *Launaea benadirensis* Chiov. and presumably appears to belong to the *Panicum pinifolium*–*Launaea benadirensis* community (found on limestone cliffs covered by aeolian sand) and

the *Justicia*–*Polycarpea somalensis* community (growing on mobile sand deriving from the costal reefs) which have been observed near Mogadishu by Pignatti et al. (1987, Fig. 3.2) and at Sar Uanle by Moggi (1987).

Moggi (1987) considers the latter community very common along the Somalian coast, underlining it has many aspects in common with the vegetation studied at Sar Uanle.

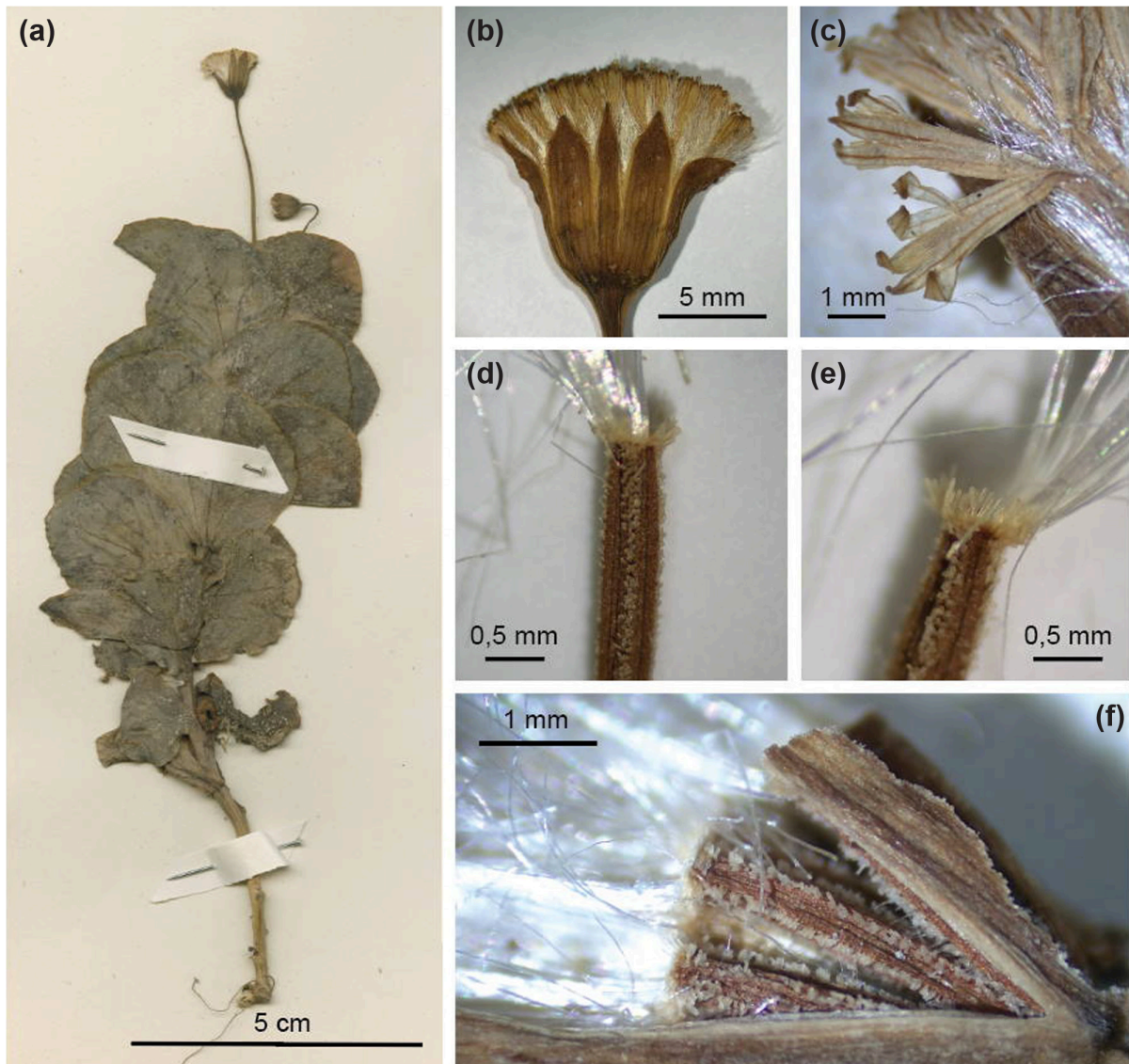


Figure 2. Plate showing anatomical details of *Emilia corallina* sp. nov. (from FT0007435): (a) whole plant, (b) capitulum, (c) capitulum close-up of florets, (d–e) achene, (f) fruiting capitulum close-up of achenes.

Distribution

The reported specimens define a distribution limited to the locus classicus and surroundings areas, along the coast between 0°30'S, 42°26'E and 0°37'S, 42°27'E (Fig. 3).

Theoretically this species could be present in Kenya as well, at least in areas adjacent the border with Somalia, although the coast in Kenya is somehow different according to Moggi (1987), being sandy and shallow, but with high coral rock cliffs (up to 15 m) immediately behind (from which the sand originates via erosion) and followed inland by a strip of forest (with trees up to 5–10 m tall) at not more than 50–100 m from the high tide limit.

According to Picchi Sermolli's vegetation map (1957) the same situation occurs along part of the Somali coast as well. Friis and Vollesen (1989) report the woodland to be less pronounced in the Chisimaio dunes.

If *E. corallina* is narrowly associated with the vegetation documented by Fig. 4, it is not likely to reach the Kenyan border and might have a distribution restricted to the area south of Chisimaio.

Comments and further investigations

Most likely the same species is represented by another collection (FT! FT0007407: 0°37'S, 42°27'E, 9–11 Jun 1973 R. Bavazzano s.n.) from the Sar Uanle area, but this time from a rocky plain, with *Sterculia* and *Combretum*, instead of the dune area in which the type was found. This plant shows some differences in that the habit as it appears to be more herbaceous and slender, around 25 cm tall, the leaves are smaller and spatulate throughout the plant, the capitula are slightly smaller and more abundant, grouped mostly in

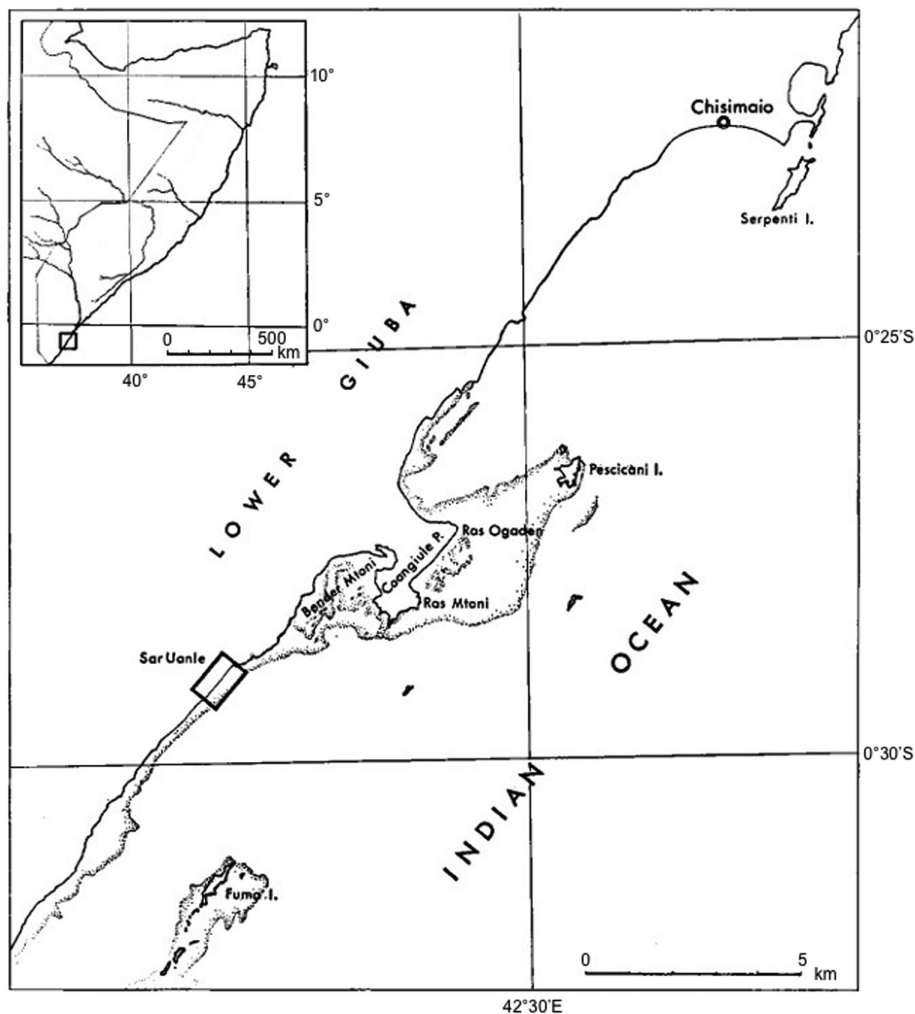


Figure 3. Map showing the localities of Sar Uanle and Fuma island (modified from Pardi 1977).

3:s, each head on a peduncle/stalk up to 7 cm long, with their bases arising close together. Florets and achenes appear to be similar.

Additional material examined (paratypes)

Somalia: Oltregiuba, Sar Uanle (Chisimaio), rocce presso il campo (rocks close to the camp), 0°37'S, 42°27'E ca, 9–11 Jun 1973 R. Bavazzano s.n. (FT! FT0007407); Somalia, Reg. Jubadda Hoose (Basso Giuba), Boscaglia rada su substrato madreporico ed emergenze rocciose lungo la costa (bushland on madreporic substrate and rocky outcrops along the coast), fra Ras Mtoni e Sar Uanle, ca 15–20 km a SW di Chisimaio, 0°30'S, 42°26'E, 15–16 Oct 1971, G. Moggi, R. Bavazzano s.n. (FT! FT0007431, MO!); Somalia, Oltregiuba, Sar Uanle (Chisimaio): costa rocciosa (rocky coast), 0°37'S, 42°27'E, 16 Jun 1973, R. Bavazzano s.n. (FT! FT0007432); Somalia Meridionale, Sar Uanle (Chisimaio): fascia costiera (coastal strip), 0°37'S, 42°27'E, 25–26 Jul 1975, M. Tardelli 132 (FT0006589); Somalia Meridionale, Sar Uanle: duna a Sud (southern dune), 31 Jul 1975, G. Moggi, M. Tardelli, R. Bavazzano 237 (FT! FT0007435); Somalia Meridionale,

Sar Uanle (Chisimaio): costa rocciosa (rocky coast), 0°37'S, 42°27'E, 29 Jul 1975, G. Moggi, M. Tardelli, R. Bavazzano 184 (UPS!); Somalia Meridionale, Sar Uanle (Chisimaio): costa rocciosa (rocky coast). 0°37'S, 42°27'E, 30 Jul 1975, G. Moggi, M. Tardelli, R. Bavazzano 217 (K!).

Somalia: Reg. Jubadda Hoose (Basso Giuba), Boscaglia rada su substrato madreporico ed emergenze rocciose lungo la costa (bushland on madreporic substrate and rocky outcrops along the coast), fra Ras Mtoni e Sar Uanle, ca 15–20 km a SW di Chisimaio, 0°30'S, 42°27' E, 15–30 Oct 1971, G. Moggi, R. Bavazzano s.n. (FT! FT0007655, FT 0007624, FT 0007623, FT 0007625, CI!, EI!, UPS!, W!); Somalia: Reg. Jubadda Hoose (Basso Giuba): costa rocciosa presso Sar Uanle (rocky coast near Sar Uanle), 0°30'S 42°26'E, 18-21 Oct 1971, G. Moggi, R. Bavazzano s.n. (FT! FT0007622).

Risk assessment

This new species can be considered a narrow endemic. No updated data are available about the status of the area where this species grows, even if satellite images do not show any

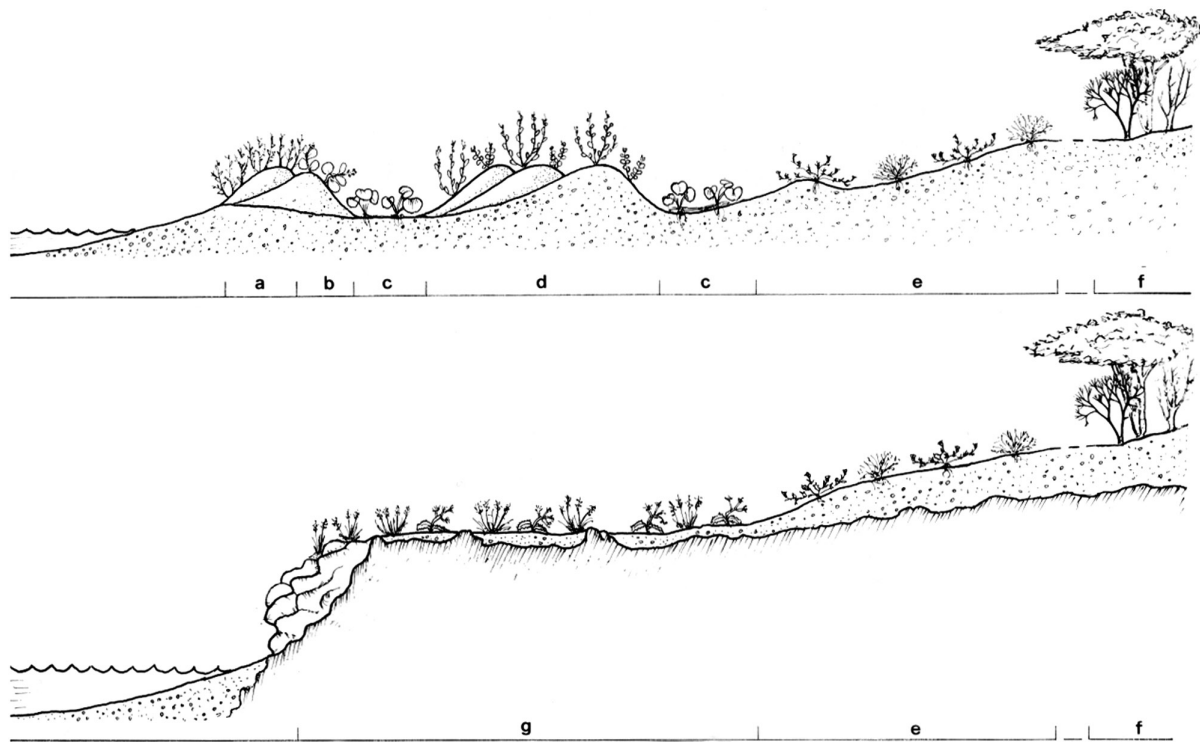


Figure 4. Transects showing the zonation of sandy (above) and rocky (below) coastal vegetation of the southern Somalia. (a) *Atriplex farinosa* community, (b) *Scaevola plumieri* community, (c) *Ipomea pes-caprae* community, (d) *Justicia-Polycarpea* community, (e) *Hypoestes-Cyperus chordorrhizus* community, (f) *Acacia tortilis* and *A. bussei* community, (g) *Panicum-Launaea benadirensis* community. Zones (d), (g) and (e) are where *Emilia corollina* grows (modified from Pignatti et al. 1987).

disturbance. Provisionally we prefer to consider this new taxon Vulnerable (VU) D1 (estimated number of mature individuals less than 1000) in absence of more data (IUCN 2012).

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