

## *Emilia* (Compositae) in Ceylon\*

by

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The genus *Emilia* (Compositae: Senecionidae), thought small, is intrinsically difficult taxonomically. The species, though distinct in appearance when living seem to lose some of their distinguishing features when dried. The principal taxonomic characters are in habit, robustness, leaf shape, texture and margin, pubescence, shape of involucre, relative length of involucre and florets, number and color of florets, and achene surface. Many species are so weak and delicate, deficient in supporting tissue in the stems, that, though firm and turgid when living, they wilt and collapse on being uprooted, often before they are pressed, making tangled nondescript specimens. The heads on a plant may be very few in number and are easily lost from mounted specimens, making identification difficult if not impossible. Some of the taxa seem to be very plastic, but this cannot be established with any confidence until the taxa are more clearly defined than they have been.

The revision by S. Garabedian (Kew Bull. 1924 : 137-144, 1924), while it may be satisfactory for the African species, does not deal very effectively with those of South Asia, several of which have become widely established in the tropics as weedy adventives. Garabedian admits three species, *E. sonchifolia* (L.) DC., *E. walkeri* Hook. f. and *E. zeylanica* C.B.Cl., from Ceylon.

The native range of the genus is Africa south of the Sahara, the moister parts of Asia, south of the Himalaya, South China eastward to Japan, the Philippines, and one species extends into the Pacific Islands. How far east in the Pacific it may be regarded as indigenous is difficult to determine, but it occurs in the high island groups at least to the Austral, Society and Marquesas Archipelagos. In Hawaii and Micronesia it is certainly introduced.

### DESCRIPTION OF THE GENUS

*Emilia* Cass., Bull. Soc. Philom. 1817: 68, 1817.

Weak to robust annual to perennial herbs, rarely slightly suffrutescent at base, herbage usually somewhat glaucous; leaves alternate, varying greatly from basal to upper cauline, frequently clasping at base; inflorescence 1- few-headed, usually loosely corymbosely branched or sub-umbelloid; heads discoid, involucre of a few (usually 8-10) linear-oblong phyllaries in one series, coherent but tending to pull apart on drying and with age, edges imbricate, receptacle convex, naked, gently rugose, florets 10 to 100 or more, corolla very slender, with a firm, cup-shaped, somewhat dilated base, upper portion gradually very slightly expanding

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upward, lobes 5, triangular to oblong-lanceolate, spreading, stamens 5, filaments very slender except the top 0.3-1.0 mm which is firm and cylindrical, style-branches exerted, slightly recurved; pappus abundant, capillary, minutely scabridulous, caducous, achenes prismatic, truncate distally, with 5 angles, these with open to almost closed grooves with minute puberulence in them, sometimes with intermediate ribs, outer achenes fertile, inner sterile.

In Ceylon there are a number of species, one or more of them occurring in most habitats. They have been treated differently by Trimen, Garabedian and Alston. The latter paid considerable attention to the genus, but because he accepted Garabedian's interpretation of *E. javanica*, his conclusions were in some respects less than satisfactory. Garabedian's rather ill-defined concepts of *E. sonchifolia* and *E. scabra* further contribute to confusion in the classification of the Ceylon species of the genus. Alston admitted 4 species for Ceylon and, hesitantly, a fifth, *E. prenanthoidea* DC.

Two groups are represented in Ceylon. One, composed of firm, usually upright herbs, mostly referred to, throughout their China, India, Philippines to New Guinea range, as forms of *Emilia prenanthoidea* DC. Two intergrading forms of this group are known from Ceylon, usually considered as one or two distinct endemic species, *E. zeylanica* C.B.Cl. and *E. walkeri* Hook. f. The other group centers around the widespread *Emilia sonchifolia* (L.) DC. The five taxa distinguished below in this group might be regarded as varieties of *E. sonchifolia*, and, indeed, that was my own earlier disposition of them. Further study of a better range of specimens and opportunities to observe some of them living make me now inclined to regard them as separate, though related species. Their relationships with Indian species, especially *E. scabra* DC., are not entirely clear, though at present all except *E. sonchifolia* appear to be Ceylon endemics. The following key and the text under the individual species is an essay toward clarification of the status of the Ceylon taxa of *Emilia*.

#### KEY

- A. Plants with a firm, usually upright stem, heads almost as broad as high.
  - B. Cauline leaves oblong with dentate margins and a conspicuously expanded terminal segment, lower part well over 1 cm wide. . . . *E. zeylanica* var. *walkeri*
  - BB. Cauline leaves narrower, linear or narrowly oblong to oblanceolate, firm, margins subentire, terminal segment narrowly triangular to ovate, lower part less than 1 cm wide. . . . . *E. zeylanica* var. *zeylanica*
- AA. Weak low plants with subscapose sparingly branched inflorescences of few cylindrical heads, involucre clearly narrower than height of heads.
  - C. Fleshy glaucous plants, much branched when well developed, forming dense mat-like clumps from a heavy cord-like root-crown, leaves, except uppermost, petiolate, sub-lobate, broader than long, uppermost (except inflorescence bracts) cuneate at base; florets exerted 1-2 mm. . . . . *E. baldwinii*

- CC. Not fleshy, sparsely branched, uppermost leaves not cuneate.
- D. Well developed lower leaves deeply and irregularly pinnately lobed, when poorly developed reduced to a strap-shaped petiole with a triangular ovate blade.
- E. Florets scarcely exerted from involucre.....*E. sonchifolia*
- EE. Florets strongly exerted, 5-6 mm.....*E. exserta*
- DD. Leaves not usually deeply lobed, terminal segment ovate to reniform not notably triangular, florets exerted 3 mm or less.
- F. Terminal segment of leaves orbicular to reniform, uppermost leaves more or less oblong or somewhat enlarged distally, florets exerted 2-3 mm from the 6 mm long involucre.....*E. alstonii*
- FF. Terminal segment ovate to orbicular, uppermost leaves sagittate-cordate, florets scarcely exerted from the 8-9 mm long involucre.....*E. speesene*

**Emilia zeylanica** C. B. Clarke, Comp. Ind. 175, 1876 ; Trimen, Handb. 3: 46, 1895; Garabedian, Kew Bull. 1924: 144, 1924; Alston in Trimen, Handb. 6: 171, 1931.

Erect firm herb; stems leafy, simple or sparsely branched at or near base; leaves sessile, bases auriculate to sagittate clasping, blades becoming smaller upward; inflorescence exerted 1-2 dm, irregularly branched, of few heads, involucre cylindrical, as broad or almost as broad as high, bracts loosely coherent, edges imbricate longitudinally, tending to separate when drying; florets strongly exerted from involucre, corolla lobes 2-2.3 mm long, minutely papillate-puberulent at tips, pale purple; achenes prismatic, heavily 5-ribbed, a very narrow groove on summit of each rib, minutely hispidulous in a fine line in each groove, truncate at summit, pappus caducous.

This species is in habit manifestly close to *E. prenanthoidea* DC. and I at first considered that it should be placed under that species as a variety. However, the differences in the morphology of the heads suggests that it might best be regarded as an independent species, endemic in Ceylon, or if the var. *paludosa* Gamble and the other material cited from Madras by Garabedian really belong here, occurring in Ceylon and southern India. The two Ceylon varieties, maintained as species by Garabedian, intergrade in a confusing manner, but since the extremes are conspicuously different, are here given varietal rank, following, in part, Trimen.

Found at high elevations in patanas and edges of forests.

Var. *zeylanica*

Cauline leaves narrowly oblong to oblong-lanceolate or even linear, entire or subentire, 1 cm or less wide, apical portion usually not conspicuously wider than middle to basal part, or somewhat but not abruptly dilated, blades firm.

Type collected in Ceylon by *T. Anderson* not seen by me.

Ceylon: in patanas 2000-2300 m.

"A(dam's) Peak & N(uwara) Ellia, *Gardner*" C.P. 430 (PDA, BM); ascent to Adam's Peak, 4500 ft., *Grierson* 1045 (US); Horton Plains, about 1 1/2 miles from Farr's Inn at Ohiya Road, *Mueller-Dombois* and *Cooray* 68011310 (PDA, US); north edge of Horton Plains. 2200 m., *Gould* 13564 (US, TAES); Pedrotalagalla, 7000 ft., *s. coll.* in 1881 (PDA); 7500 ft, *Grierson* 1066 (US); Kunadiyaparawita, *Lewis*, in 1917 (PDA); Nuwara Eliya, *s. coll.* in 1880 (PDA); Moon Plains, *Alston* 624 (PDA); Laxapana, Maskeliya, *Simpson* 8986 (BM); Nuwara Ellia, 6000 ft. *Gardner* 422 (BM) : "Kandy", *Moon* in 1819 (BM) : near Gartmore Estate, Maskeliya, *Silva* in 1926 (PDA); Thotulagalla Ridge, Haputale, *Fosberg* 51835 (US, PDA, Fo).

Var. *walkeri* (Hook. f.) *Trimmen*, *Handb.* 3: 46, 1895.

*E. walkeri* Hook. f., *Fl. Brit. Ind.* 3: 33, 1882; *Garabedian*, *Kew Bull.* 1924: 142, 1924.

Cauline leaves with apical half expanded, ovate or triangular, basal part 1.5 or more cm wide, usually somewhat toothed, membranous.

The type is *Thwaites* 430 (BM).

Ceylon: on peaks, ridges, patanas and in edges of forest, at high elevations.

"A(dam's) Peak & N(uwara) Ellia", *s. coll.* C.P. 430 (PDA, 3 sheets) ; "media provincia ins : 6-8000 ped." *Thwaites* 430 (BM); Pedrotalagalla, 7500 ft., *s. coll.* in 1881 (PDA); 6700 ft., *Grierson* 1075 (US); Adam's Peak, at base of cone *Alston* 959 (PDA); Horton Plains, at "World's End", 2130 m., *Mueller-Dombois* and *Comanor* 67070853 (PDA, US); Horton Plains-Pattipola Road, 6500 ft., *Grierson* 1091 (US); Top of Naminakuli (near Haputale) *Silva* in 1907 (PDA, 2 sheets); Haputale near Adisham Monastery, *Mueller-Dombois* 68051902 (PDA, US); Ambawela-Pattipola road, 1860 m, *Comanor* 937 (US, Fo, E. BM, TI, NY, POM) Ambawela, *Alston* 1021 (PDA); near Gartmore Estate, Maskeliya, *Silva* in 1926 (PDA); Adam's Peak Waterfall, 7 mi. s.w. Maskeliya, 4000 ft., *Grierson* 1054 (US); Adam's Peak Sanctuary, Bogawantalawa-Boralanda Road, 1400m, *Comanor* 1088 (US, Fo, E, BM, TI, NY).

Some sheets, e.g. *Mueller-Dombois* 68051902, *Gould* 13564 and *Grierson* 1091, are so intermediate as to be very difficult to assign to a variety. Actually, there are no satisfactory lines between these two varieties, and if the extremes were not so conspicuously distinct it would be easy to regard them as one variable variety.

*Emilia sonchifolia* (L.) DC., in Wight, Contr. Bot. Ind. 24, 1834; Prodr. 6: 302, 1837; Trimen, Handb. 3: 45, 1895; Garabedian, Kew Bull. 1924; 141, 1924; Alston, in Trimen, Handb. 6: 171, 1931 (but see *E. baldwinii* below).

*Cacalia sonchifolia* L., Sp. Pl. 835, 1753.

Weak, subglabrous to sparsely unevenly pilose, rather glaucous herbs, leaves deeply and irregularly pinnately lobed, terminal segments triangular, rarely broadly cordate in shaded plants, and shallowly and bluntly dentate, petioles of lower leaves narrowly winged, those of cauline broad, auriculate-clasping; inflorescence subscapose, about twice length of leaves, or longer, with 1-2 ovate-lanceolate bracts, cordate-clasping at base, sparsely corymbosely branched near top, with 3-6 heads; involucre narrowly cylindrical, 7-9 × 2.5-3 mm, flowers 30-60, exerted no more than about 1-1.5 mm or scarcely at all, "pale mauve," corolla lobes scarcely 1 mm long; achenes prismatic, about 2.5 mm long, 5 ribbed, the ribs grooved, the grooves puberulent.

Ceylon: in open grassy or weedy places from sea level to 500 m.

Peradeniya, 3/4 mile upslope from University Circuit Bungalow, 1000 m., *Mueller-Dombois and Cooray* 67103113 (US); Kandy, *Moon* in 1819 (BM), *Fosberg* 50669 (US, PDA); Peradeniya, *Alston* 1407 (PDA); *Fosberg* 50658 (US, PDA); Hindagalla, 1900 ft., *de Silva* 10 (US); Ruhuna National Park, Patanagalla 2-3 m *Fosberg* 50366 (US), 51161 (US, PDA), 51165 (US), 50366 (US, PDA, Fo, NY, BM, TI, POM, UC, AAH); Ruhuna National Park, Block 1, Rakina Wewa, near Gonalabbe Lewaya, 2 m., *Fosberg* 50263 (US); Main Yala Road, mile marker 7, 6-10m, *Comanor* 826 (US, Fo, E, BM.); Mt. Lavinia, Colombo, 1 m., *Fosberg and Read* 51796 (US, PDA, Fo); Wilpattu National Park, Marai Villu, *Fosberg et al.* 50872 (US, PDA).

This is the most widespread species of *Emilia*, found in most tropical countries, and has been variously interpreted, in Ceylon as well as elsewhere. Whether it is really as variable as commonly supposed is doubtful. In Ceylon a critical examination shows that at least 5 reasonably well-marked species have been included in *E. sonchifolia*. In Hawaii even *E. javanica* has been lumped with it. Here it is restricted to the very delicate form shown by Baldwin (Bull. Torrey Bot. Club 73: 18-23, 1946) to be a diploid. Baldwin's fig. 1 is an excellent illustration of *E. sonchifolia* as described here.

*Emilia exserta* Fosberg sp. nov.

*E. scabra* sensu Alston, in Trimen, Handb. 6: 172, 1931, non DC. Folia inferiores pinnata lobata, superiores oblongi subintegri; involucrem 6 mm longum flosculo valde superatum; flosculi pallide-purpurei, lobis corollae 1.5-2 mm longis.

Weak herb, stem creeping with erect branches, these leafy in lower parts, leaves variable, lower ones tending to be pinnately lobed with a large triangular or ovate terminal segment, more usually the lobes suppressed and petiole winged or scarcely so, somewhat clasping,

upper cauline leaves oblong to lanceolate or strap-shaped, entire to very shallowly and remotely dentate, strongly clasping, leaves tending to be pilose, hairs on wilting tending to crumple and become woolly; inflorescence 1-3 dm long, very loosely several times branched, with reduced leaves or bracts becoming smaller upward, each branch ending in 1-3 pedunculate heads, involucre short cylindric, about  $6 \times 3$  mm, flowers 26-54, exerted about 5-6 mm, pinkish lavender, spreading to about 13 mm, corolla lobes 1.5-2 mm long, anther tube about 1.5 mm long, appendages 0.3 mm long, thickened parts of filaments 0.4 mm long; achenes prismatic, minutely setulose or scabridulous on the 5 angles, pubescence originating in a narrow groove, this more evident in sterile than fertile achenes.

The holotype is *Fosberg* 50659 (US) from Peradeniya.

Ceylon: disturbed places, patanas, road embankments, on western lower slopes of the mountains, 50-600 m elevation, tending to be weedy.

S. l., C. P. 3343 (PDA, 2 sheets); no data (PDA); Gammaduwa, *Alston* 663, 664 (PDA); Peradeniya, *Mueller-Dombois and Cooray* 67103113 (PDA); *Alston* 2041 (PDA); *Fosberg* 50651 (US, PDA, Fo, E, BM, TI, NY), 50659 (US, type, PDA, Fo, E, BM), 51805 (US, PDA, Fo, E), 51858 (US, PDA); Lower Hantana, Peradeniya, *Fosberg* 51862 (US, PDA, Fo, E, BM, TI, NY, POM); Madugoda, 535 m, *Comanor* 689 (US, Fo, E, BM, TI, NY, POM), *Simpson* 8791 (BM); 3 mi.e. of Ingiriya on Panadura-Ratnapura Road, *Fosberg & Read* 51801 (US, PDA, Fo, E, BM, TI, NY, POM, UC); Kandy Annewatta 500 m, *Comanor* 345 (US, Fo); road from Ginigathena to Avissawella, marker 67.7, 500 m, *Comanor* 554 (US, Fo, E, BM, TI, NY, POM UC); Helbodde Tea Estate, 100 m., *Mueller-Dombois* 67052804 (US); Parragalla, bet. Gampola and Dolosbage, 3000 ft., *Grierson* 1006 (US); Ratnapura, 130 ft., *Grierson* 1022 (US).

A species of low to middle elevations, tending to be weedy.

This is the plant *Alston* in *Trimen, Handb. 6: 171, 172, 1931*, called *E. javanica* (Burm.f.) *Rob.*, which it is not, as that is a larger, red-flowered species, not yet found in Ceylon. *Trimen, Handb. 3: 45-46, 1895*, referred it to *E. sonchifolia* from which it differs conspicuously in its greatly exerted florets. *Haigh et al.*, in "A manual of the weeds of the major crops of Ceylon" (Colombo 1951) give a plate and text under *E. javanica*. They give the vernacular names "Hulantala" and "Kadupaia" (Sinhalese) and "Malalkat-pillu", "Mammoty-pullu", "Elunthani", "Saip-patti", and "Inumpatti pillu" (Tamil).

***Emilia alstonii*** Fosberg, sp. nov.

Folia inferiores vix lobata segmentis ultimis reniformibus, sursum reducta, petiolis valde alatis basibus cordatis, superiores oblonga; involucrem flosculo 2-3 mm superatum; flosculi valde purpurei, lobis corollae 1.2 mm longis.

Differs from *E. exserta* in lower leaves with only a slight tendency toward pinnate lobing, but with terminal segment orbicular to reniform with rounded apex, margin of this undulate rather than dentate, petiole scarcely winged to narrowly so, middle leaves with

broad wing in lower part, slightly lobed above or not, cordate clasping at base, terminal segment orbicular to reniform, upper leaves more or less oblong or somewhat enlarged distally, usually notably undulate, dentate or crenate; inflorescence almost bractless, heads slightly wider than in *E. exserta*; florets 56-100 in a head, not so much exserted, about 2-3 mm exceeding involucre, bright to dark purple, corolla lobes about 1.2 mm long.

The holotype is *Fosberg* 51822 (US) from Yahalle Badde, below Haputale.

Ceylon: An upland species, known from the eastern and southern parts of the mountain mass, weedy along roads, in eroded patanas, and tea-plantations.

Hakgalla Estate, *Alston* 630 (PDA); Castlereagh Estate, *Alston* 1905 (PDA); Hunasgiriya Group, Wakeyama, (*Alston?*) in 1926 (PDA); Thotulagalla Ridge, Haputale, *Fosberg* 52841 (US, PDA, Fo), 51844 (US), 51839 (US), 51839a (US), 51829 (US, PDA, Fo, E), 51831 (US, PDA, Fo, E); Yahalle Badde, below Haputale, *Fosberg* 51819 (US, PDA), 51820 (US, PDA, Fo, E), 51821 (US), 51822 (US, type, PDA, Fo, E), 51823 (US, PDA, Fo, E), 51824 (US, PDA, Fo), 51817 (US, PDA, Fo); Glenanore, below Adisham, Haputale, 51857 (US, PDA, Fo), 51852 (US, PDA, Fo); Ratnapura Distr., Brampton Group Estate near Belihul Oya 4500 ft., *Grierson* 1150 (US).

This was referred to *E. scabra* DC. by Alston in Trimen, Handb. 6: 171, 1931. *E. scabra*, judging by DeCandolle's description (Prodr. 6: 303, 1837) is more nearly related to *E. coccinea* (Sims) Sweet than to the *E. sonchifolia* group, to which the present species belongs. It is described as having about 100 florets in a head and as being more pubescent than *E. sagittata* [sensu DC., non (Vahl) DC., *E. coccinea* (Sims) Sweet]. I have not examined the type, collected by Wight "In India orientalis", which is presumably in Geneva, but have little doubt that it differs substantially. The new species is named for the late A. H. G. Alston, who was interested in this genus and who did much for Ceylon botany.

One specimen, a single individual, from Thotulagalla Ridge, Haputale, *Fosberg* 51836 (US), seems intermediate between this species and *E. zeylanica*, both of which grow nearby.

***Emilia speeseae* Fosberg, sp. nov.**

Planta leviter robusta infra medium foliosa; folia segmentis ultimis orbicularis vel ovatis petiolis valde alatis dentatis superiores sagittatocordata; bractea valde reductae lineares; capitula 3-5 longi-pendunculata, involucris 4-5 × 6-9 mm flosculis vix superatis; flosculi purpurei.

A somewhat robust plant for this group, somewhat pilose, rather leafy in basal half, the middle cauline leaves on well developed plants with terminal segment orbicular to ovate, petiole broadly winged, uppermost leaves sagittate-cordate, all leaves at least obscurely bluntly dentate; inflorescences with bracts much reduced, linear, peduncles 3-5, 2-12 cm long, irregularly or umbelloidly arranged, each with a single head; involucre cylindric to slightly urceolate, 4-5 × 7-9 mm, florets about 60, only slightly (1-2 mm) exserted, bright purple or dark mauve, corolla lobes 1.1-1.5 mm long.

The holotype is *Fosberg* 51837 (US) from Thotulagalla Ridge, Haputale.

Ceylon : Found at fairly high elevations in the mountain mass, rather weedy.

Dalhousie Estate, *Alston* 969 (PDA); Yahalle Badde, below Haputale, *Fosberg* 51818 (US); Haputale, *Alston* 2469 (PDA), 2470 (PDA); Thotulagalla Ridge, Haputale, *Fosberg* 51837 (US, type, PDA); above Ramboda at highway A5 on way to Nuwara Eliya, near mile marker 36, *Mueller-Dombois* and *Cooray* 68051509 (PDA, US); along eastern trail to Adams Peak, 1900 m, *Gould* 13600 (US, TAES).

This would probably have come within Alston's concept of *E. scabra* though it might run to *E. sonchifolia* in his key. These localities are not cited by him. It is more robust than *E. alstonii*, has different shaped leaves and the florets are less exserted. It is doubtless closest to this species. The name is in recognition of the chromosome work on *Emilia* done by Dr. Bernice Speese, of the College of William and Mary, Williamsburg, Va.

***Emilia baldwinii* Fosberg, sp. nov.**

Planta glauca subcarnosa subglabra valde ramosa ; folia inferiores sublobata obtusa petiolata, superiores sessilia ovato-cuneata ; inflorescentia 2-capitellata ; involucrium 4 × 10 mm flosculo vix superatum.

Much branched from a deep strong cord-like root crown, forming a loose mat when well developed (but flowering already when scarcely branched); leaves glaucous, rather fleshy, almost glabrous, petiole except uppermost, blades at most 1.5 cm long 2 cm wide, decurrent onto slender petioles 1-2 cm long, uppermost leaves sessile, ovate with cuneate base, very coarsely dentate ; inflorescence about 1 dm high, with one oblong reduced bract about half way up, 1 or 2 heads, involucre cylindric, about 10 mm long 4 mm wide, bracts 8; florets 40-50, scarcely exserted, 1.5-2 mm, pale mauve, rarely white, corolla lobes about 1 mm long; achenes to 4 mm long, prismatic, scabrous in 5 grooves situated on angles, 3 ribs between each 2 grooves.

The holotype is *Fosberg* 50344 (US) from Patanagala.

Ceylon : A halophyte, found around the south and west coasts of Ceylon. Confined to sand flats and, rarely, rocky places just back of the seashore within the influence of the sea.

Without data, C.P. 3343 (PDA); s.l., *North* s.n. (BM); Chilaw, *Simpson* 8169 (BM); Kirinda, *Alston* 1643 (PDA, BM); Ruhuna National Park, Patanagala, *Mueller-Dombois* 67082509 (US, PDA); *Fosberg* 50344 (US, type, PDA, Fo, E, BM, TI, NY, POM, UC, A); *Comanor* 889 (US, Fo, E, BM, TI, NY, POM); Buttawa, 10 ft., *Grierson* 1143 (US); 51164 (US), 51162 (US, PDA, Fo, E); Mt. Lavinia, Colombo, *Fosberg & Read* 51797 (US, PDA, Fo, E); 1 mile west of Hambantota, *Fosberg* 51217 (US, PDA, Fo); Hikkaduwa, 11 miles north of Galle, *Fosberg* 36768 (US).

This was what Alston called *E. sonchifolia*, and I first placed it in the latter as a variety but Dr. John T. Baldwin, Jr., of the College of William and Mary, who raised plants from seeds furnished by me, pointed out its distinctness. It is named for him in recognition of his work on the cytology of the genus. At Patanagala plants of this (*Fosberg* 51164) and of *E. sonchifolia* (*Fosberg* 51165) grew within 10-20 cm of each other in the edges of strand forest and maintained their distinctive characters. Hence it does not seem likely that they are ecological forms of one species as I earlier supposed.

A plant from Male, Maldive Is., *Fosberg* 36855 (US) approaches this species in its fleshiness, but in other characteristics seems to be *E. sonchifolia*. It was growing just back of the beach and perhaps the fleshiness is merely a response to saline conditions.

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