Lobophora J. Agardh, 1894

DICTYOTALES, DICTYOTACEAE

Thalli decumbent to erect, arising from a matted rhizoidal holdfast, up to 20 cm long, with broadly flabellate to irregularly laterally branched fronds. Growth initiated by a complete row of apical cells. Thalli usually 7-12 cells thick with an outermost layer of cortical cells overlying the larger internal medullary cells. Cells in transverse section rectangular, arranged in tiers with 2 cortical cells overlying each medullary cell. Medullary cells of uniform size except for the markedly larger central layer. Cortical cells with numerous discoid chloroplasts. Hairs arranged in concentric lines or scattered tufts. Tropical to temperate seas.

- M.D. Guiry in Guiry, M.D. & Guiry, G.M. 2021. *AlgaeBase*.

Species reported from Sri Lanka

Lobophora variegata (Lamouroux) Wormsley ex Oliviera, 1977

syn. *Zonaria variegata* (Lamx.) C. Ag. 1817 [Børgesen, 1936]
Pocockiella variegata (Lamx.) Papenfuss, 1943
Zonaria latissima Sonder ex Kützing, 1859

- Silva et al, 1996

- Durairatnam, 1961: 34, Pl. VII, Fig. 9 (as '*Pocockiella*')

Lobophora ceylanica (Harvey ex E. S. Barton) C. W. Vieira, De Clerck & Payri 2016

- Coppejans et al, 2009: 138 Fig. 111 (as *Ralfsia* ceylanica)
- Durairatnam, 1961: 31 (as *Ralfsia ceylanica* Harvey ex Barton, 1903)
- Silva et al (as *Ralfsia ceylanica* Harvey ex Barton, 1903) [Harvey 1857: no. 59; G. Murray 1887]

Description of species

Lobophora variegata (J.V. Lamouroux) Wormsley ex E.C. Oliveira, 1977

Synonym: *Pocockiella variegata* (J.V. Lamouroux) Papenfuss, 1943

Morphology Thalli variable, thin or thick, discoid, attached by rhizoids to hard substrates (Colombo reefs, Maggona, Great Basses ridge), or erect, clustered, attached by a holdfast (Kalpitiya, Bar reef). Colour usually dark brown to black underwater, or grass green in shallow, clear, sunlit water (Tiria gala, Maggona). Rhizoids reddish, felted, arising from the underside, often from superficial damage scars.

Anatomy Thallus multi-layered. In surface view both upper and lower surfaces consist of radial rows of rectangular cells arranged in distinct pairs, side by side. Cells at the growing margin heavily pigmented brown, 20-25 µm wide and 4-5 times in length. One to two rows of similar cells follow filled with green chloroplasts. Subsequent cells are only half as wide but as long. In older parts the cells are similar in width (12.5 µm) but shorter (47.5-50 µm). In transverse section the epidermal cells are about 12.5 µm square, below which are 2-3 rows of rectangular cells, each covered by 2 epidermal cells. There is a single row of medullary cells that are 37.5 µm high and as wide as the cells above and below. Sporangia form on the under surface in sori, covered by an indusium.

Ecology Epilithic, forming small mats of overlapping thalli on hard surfaces at depths ranging from 3 m to 17 m, or clusters of erect thalli attached by a holdfast on coral rubble.

Discussion All collections made consist of prostrate discoid or lobed thalli except one collection (HMF 440) from the Kalpitiya Bar reef. Coppejans, 2009 confirms the existence of varying growth forms and comments that there "… is molecular evidence that the different 'growth forms' are in fact different taxa."

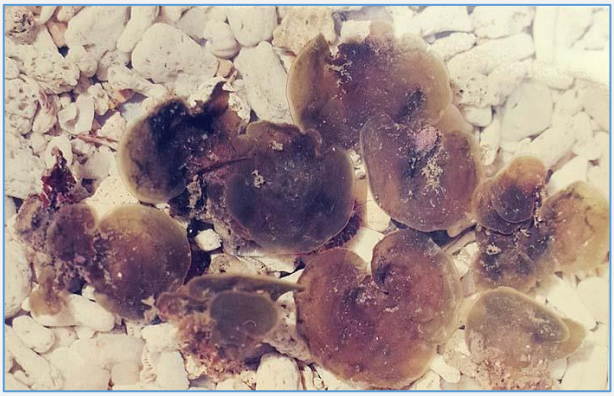
Material examined HMF 023, 18.2.1996, Mount Lavinia, First reef #3 Reef plateau - 4 m, olive green, prostrate, overlapping, lobed thalli, growing on flat rock surfaces, overlying coralline algae such as *Amphiroa*. HMF 195, 22.2. 2000, Moratuwa, Itipandama - 10 m, epilithic, brown overlapping discs attached by a thick wad of reddish rhizoids, most of the margin free. HMF 440, 1.3.2004, Kalpitiya, Bar reef, north edge, shallow reef - 3 m, epilithic on coral rubble, dark brown to blackish, a clump of fan-shaped fronds clustered together into a sub-spherical mass swaying in the current. Cellular morphology is that of *Lobophora*. However, differs from other specimens collected in the cuneate lobes with long stipes and the clustered, erect habit.

Also collected from Beruwela, Tiria gala, 21.3.1989, 6 m; Kirinda, Great Basses Ridge, 15.4.1994, 17 m; Wellawatte, Kinross reef, 17.3.1991, 3 m with *Stoechospermum* and *Spatoglossum*; Mount Lavinia, shoreward side of Bellangala, 3.11.1991, 3 m with *Spatoglossum*. Durairatnam, 1961 reports this species from Colpetty and Kankesanthurai.

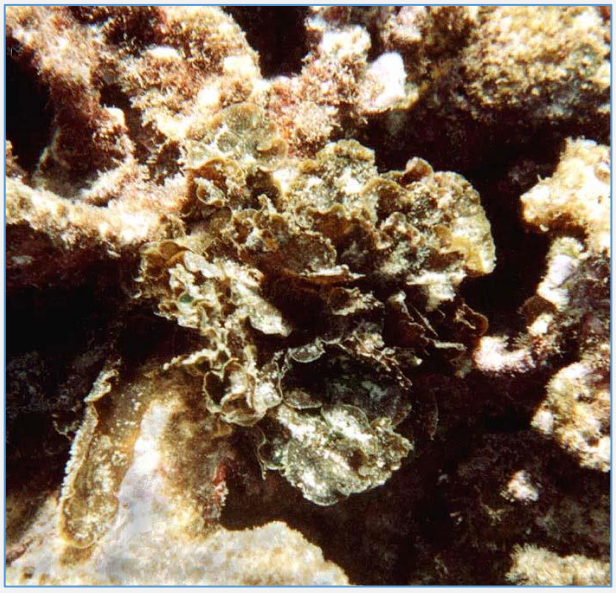
References

Coppejans et al: 138
Durairatnam, 1961: 34
Silva et al, 1996

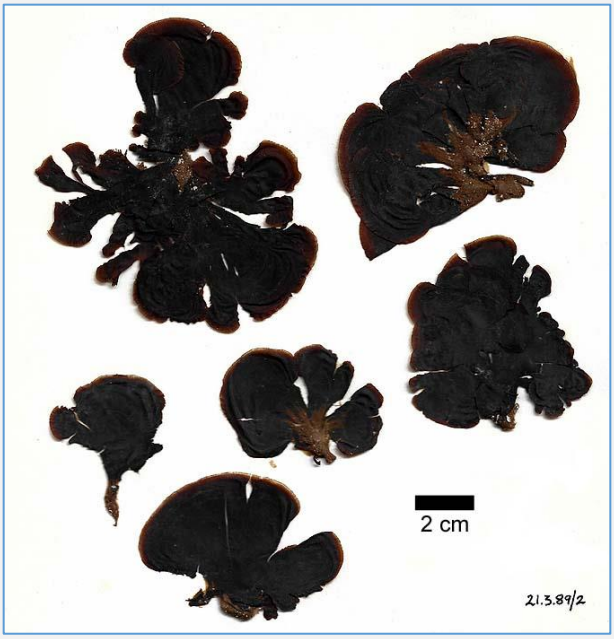
Lobophora variegata (J.V. Lamouroux) Wormsley ex E.C. Oliveira, 1977

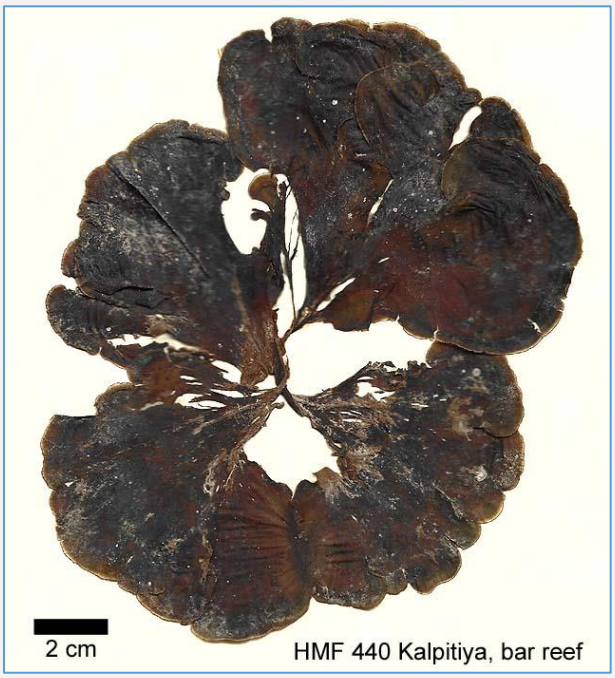


HMF 195, 22.2.2000, Moratuwa, Itipandama - 10 m
Epilithic, brown overlapping discs attached by a thick wad of reddish rhizoids, most of the margin free.
Ex situ photograph



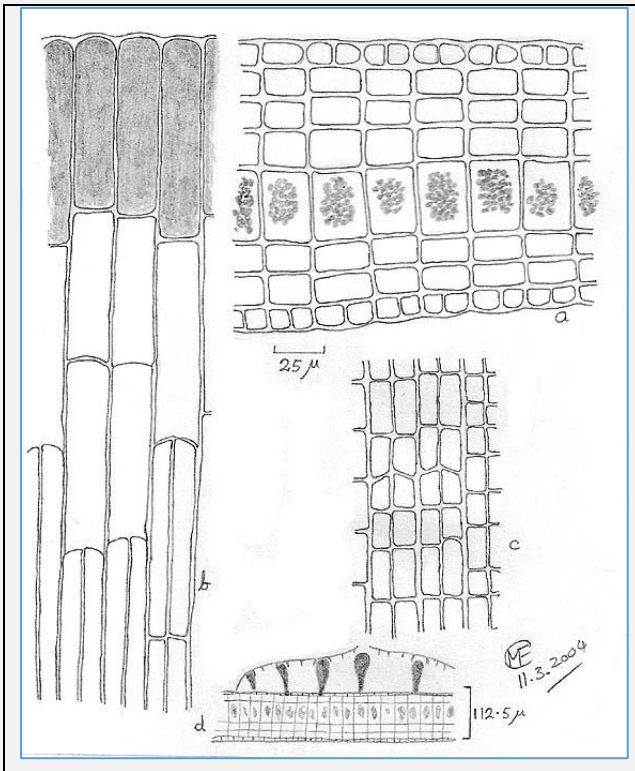
HMF 440, 1.3.2004, Bar reef, Kalpitiya - 3 m
Lobophora variegata colonising coral rubble. Differs from other specimens collected in that the lobes are cuneate with long stipes as well as the clustered, erect habit. Cellular morphology is that of *Lobophora.*
In situ, underwater photograph





Herbarium scans

Left: 21.3.89/2, Tiria gala, Maggona. Right: HMF 440, Kalpitiya, Bar reef.



HMF 440, 1.3.2004

a) Transverse section of thallus. The large medullary cells contain brown pigment, the other layers green.

b) Cells of the upper cortex in surface view, the growing margin with heavily pigmented cells, each giving rise to two columns of cells at length.

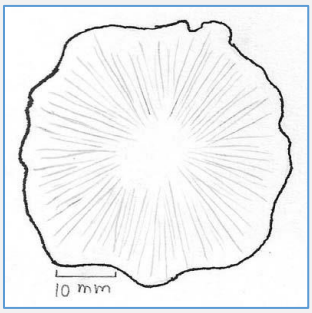
c) Upper cortical cells from an older part of the thallus, in surface view.

d) Inverted drawing of transverse section of a sorus on the underside showing developing sporangia covered by an indusium (membrane).

(a, b & c to the same scale)

***Lobophora* ceylanica** (Harvey ex E.S.Barton) C.W.Vieira, De Clerck & Payri 2016

Synonym: *Ralfsia ceylanica* Harvey ex Barton, 1903)
Type locality Sri Lanka



Morphology Thin, crustaceous, discoid, slightly lobed, thalli firmly adherent to sloping rock surfaces. Up to 6 cm in diameter, metallic golden-yellow or greenish-yellow with prominent radiating striae visible from afar. Upper surface smooth and shiny, firmly attached to the substrate throughout except the free margin. The undersurface of detached thalli felted with rhizoids and trapped sand grains.

Anatomy The thallus is multi-layered. Microscopically, radiating cords of cells that are radially aligned rectangles at the margin are seen in surface view. Proximally they divide into two in the long axis, and then at right angles to form double rows of square cells more centrally, each pair of rows separated by a clear band, accounting for the radiating striae visible macroscopically. Radially aligned rectangular cells from which septate rhizoids arise are seen on the undersurface.

Section shows a basal layer of 5 cell rows. The lowermost rows of small cells, square or flattened in transverse section (TS), flattened rectangular in longitudinal section (LS), the lowermost rows more pigmented reddish-brown than the upper ones. Above the small cells is a layer of large cells, tall-rectangular in TS, square in LS. From the upper surface of the large basal cells arise vertical filaments that branch at the extremity, increasingly pigmented greenish. In TS, the cells squarish, in LS flattened rectangular, the uppermost cells of the branches radially elongated.

Ecology Epilithic, at depths between 2 to 5 m, solitary or gregarious in overlapping sheets on bare rock or growing over sponges and polychaete tubes. More abundant at shallower depths.

Discussion Described as *Ralfsia ceylanica* in 1903 by Ethel Barton from a collection from the Laccadive Islands by Gardiner and a collection by Harvey in the British Museum. A holotype specimen is in the National Herbarium at Peradeniya as 'Harvey 59' but referred to as 'Ferguson 59' in the AlgaeBase 2021 article. Transferred to the genus *Lobophora* in 2016 based on DNA studies. My herbarium specimens and drawings compare well with Harvey 59 and the drawings in the original article by Barton, 1903.

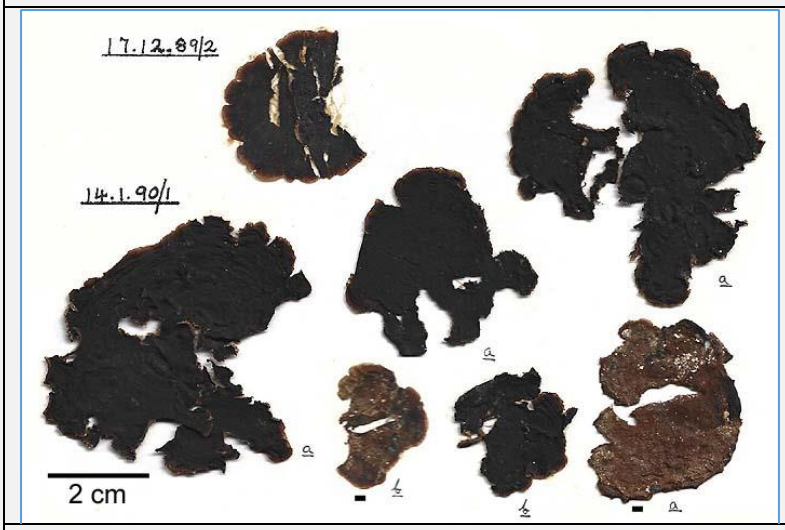
Material examined HMF 022, 4.2.1996, Mount Lavinia, First reef #2 Reef plateau - 3-5 m, golden brown, metallic, with radial striations, discoid, firmly attached to substrate throughout except the free margin; Field No. 171289/1, Mount Lavinia, Bellangala, inshore of, 3 m; Field No. 140190/1, Wellawatte, Kinross reef opposite railway station, 2 m, abundant.

Harvey 59; CA 291 from Bentota; Alston 2044 from Trincomalee at the National Herbarium Peradeniya, 12.10.2001.

References

Barton, 1903
Coppejans et al: 138
Durairatnam, 1961: 34
Silva et al, 1996

***Lobophora* ceylanica** (Harvey ex E. S. Barton) C. W. Vieira, De Clerck & Payri 2016



Herbarium scans

Field No. 171289/2: Mount Lavinia, Bellangala rocky islet, inshore slope, 3 m.

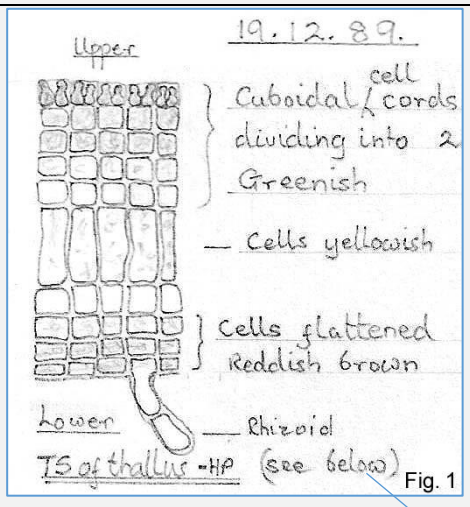
Field No. 140190/1: Wellawatte, reef opposite railway station.

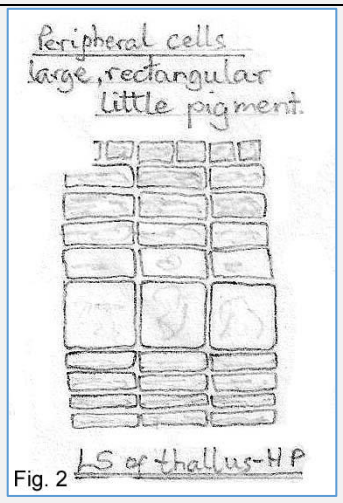
a) 2 m, abundant, upto 6 cm dia.

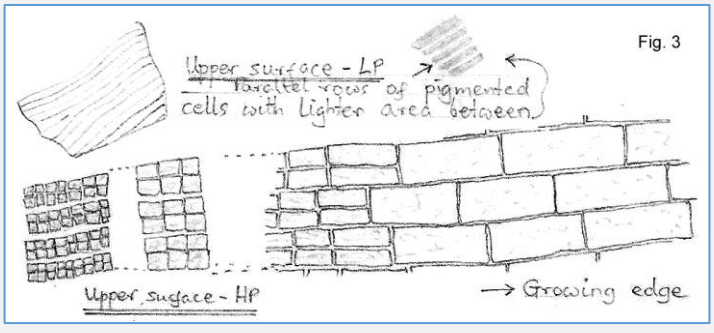
b) 5 m, uncommon, upto 3.5 cm dia.

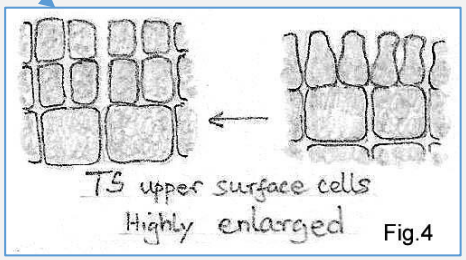
Drawn from Field No. 191289/1
Mount Lavinia, Bellangala

Fig. 1: Transverse section of thallus showing cells under high power.
Fig. 2: Cells in longitudinal section under high power (section at right angles to Fig. 1).
Fig. 3: Cells in surface view under low power.
Fig. 4: Surface cells in transverse section under high power.









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MF 17.6.2021.