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Seirospora orientalis (Callithamnieae, Ceramiales), a new red algal species from the southern Great Barrier Reef

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A diminutive (5–25 mm high), uncorticated species of *Seirospora* has been collected from 9–27 m depths on a variety of algal and invertebrate hosts at the southern end of the Great Barrier Reef. Lack of catenate paraspores (seirospores) and seeming differences in branch pattern, procarp structure, and configuration of early gonimoblasts distinguish the Australian material from the only other species of *Seirospora* with comparable anatomy, *S. occidentalis* Boergesen. As a result, the Great Barrier Reef plants are described as *S. orientalis* sp. nov. Japanese records of *S. occidentalis* are the only other reports of the genus outside the Western Hemisphere, and it is suggested that they also may represent *S. orientalis*.

*Key Index Words: Callithamnieae—Ceramiales—Great Barrier Reef—paraspore—*Seirospora*—seirospore.*

Members of the family Ceramiaceae from warm-water habitats in eastern Australia are not well catalogued, but they appear on the basis of our present knowledge to consist of a fair number of genera [at least 27 (pers. obs.)] which are often represented by few (in some cases only one) species. *Rhipidothamnion* (Huisman 1985), *Gymnophycus* (Huisman & Kraft 1983), *Balliella* (Huisman & Kraft 1984), *Crouania* (Saenger & Wollaston 1982) and *Baldockia* (Millar 1986) are examples of such genera that have been studied recently.

The Ceramiaceae from mostly intertidal and shallow subtidal habitats on the southern Great Barier Reef have been surveyed by Cribb (1983), who lists 13 genera and 27 species from the region. Among the few deep-water representatives identified by Cribb is *Seirospora occidentalis,* a species originally described from the Caribbean Sea. Collections made by the present author in the same general Australian locality (Fig. 1a, b) have included numerous specimens of *Seirospora* fitting Cribb's description but varying somewhat from published accounts of *S. occidentalis* and from the limited Caribbean material available for examination. The differences, taken together, seem to be of specific importance, with the result that the Great Barrier Reef entity is described here as new.

Seirospora is presently a genus of six Northern Hemisphere species, of which five occur in the Mediterranean Sea or at scattered localities along the rim of the Atlantic Ocean from Brazil (Joly 1967) to northern Europe. The sixth, *S. occidentalis* Boergesen (1909) is recorded from Japan (Itono 1971, 1977) as well as its Caribbean type region. With the exception of *S. occidentalis,* plants are fairly robust and to some degree rhizoidally corticated (Dixon 1971), and all species are characterized by a unique carposporophyte in which gonimolobes form branched uniseriate chains of cells that mature synchronously into rounded carposporangia (Kylin 1956). Dixon (1971) points out that this feature alone separates *Seirospora* from the large genus *Callithamnion,* as members of both have the same basic vegetative structure, procarp, and apparent immediate postfertilization development.

Description

Seirospora orientalis KRAFT, sp. nov.

Plantae erectae ad 25 mm longae, ecorticatae, irregulatim alternatim ramosae; filis carpogonialibus prae cellulam axialem fertilem horizontaliter tentibus, carpogoniis cellulis hypogynis lateraliter adjunctis, his e cellulis subhypogynibus oblique divisis, et his omnibus compactis angularibusque, trichogynis excentricis; tetrasporangiis tetraedralibus, initiis universe binis raro ternis adaxialiter portatis, sed quoque serie solum solitario eorum maturescente; sine seirosporis.

Plants erect, 5–25 mm in length, uncorticated; branching irregularly alternate, radial. Carpogonial branch directed horizontally across fertile axial cell; carpogonium angular, dovetailed against hypogynous and subhypogynous cells, with excentrically placed trichogyne. Tetrasporangial initials generally borne two (rarely three) per bearing cell, only one of each set maturing. Seirospores lacking.

Named for its Eastern Hemisphere collection localities and to emphasize its superficially close resemblance to *Seirospora occidentalis* from the Caribbean.

Holotype: MELU, A35194 (Fig. 2), collected with isotypes (MELU, A35196–8) on 19 November 1983 by G. KRAFT and R. RICKER.

Type locality: One Tree Island, Capricorn Group, Great Barrier Reef, Queensland (Fig. 1a, b).

Habitat and material examined: Plants of the holotype collection were epiphytic on *Coelarthrum boergesenii* WEBER-VAN BOSSE at a depth of 27 m along the steeply sloping front of the southwestern edge of the fringing reef. The following additional specimens have been examined:

1) One Tree Island, Qld. 20–27 m depths along the southwestern reef face, epizoic on tunicates and epiphytic on *Liagora* sp., *Gibsmithia larkumii* KRAFT, *Coelarthrum boergesenii* WEBER-VAN BOSSE, and *Titanophora weberae* BOERGESEN (MILLAR, O'BRIEN, HILL, CHIDGEY, WITHELL,

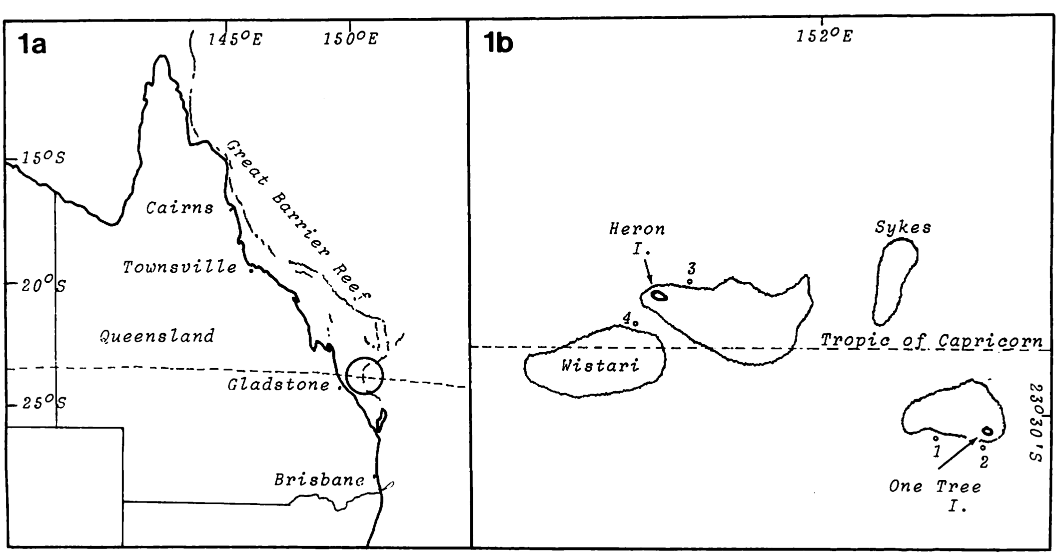


Fig. 1. Collection localities of *Seirospora orientalis*, sp. nov.

1a: Overview of northeastern Australia, showing the location of the Capricorn Group (circle) at the southern end of the Great Barrier Reef.

1b: Detail of the Capricorn Group showing the type locality (1) and Keyhole (2) on the One Tree Island reef; Blue Pools (3) on the Heron Island reef; and the mid-northeastern Wistari Reef (4).

RICKER & KRAFT, 19.xi.1983. MELU A35199–35204, 35367. Cystocarpic, spermatangial, tetrasporic). 20–27 m depths at "The Keyhole", epizoic on calcareous bryozoans and corals and epiphytic on *Galaxaura arborea* KJELLMAN (KRAFT, SCOTT & LARKUM, 21.xi.1979. MELU, A35368. Cystocarpic, spermantangial, tetrasporic); on *Coelarthrum boergesenii* WEBER-VAN BOSSE (O'BRIEN & SIOTAS, 17.xi.1982. MELU A35365. Cystocarpic, tetrasporic); on *Distromium didymothrix* ALLENDER & KRAFT (GABRIELSON & HAUSER, 17.xi.1982. MELU, A35369. Tetrasporic).

2) Blue Pools, Heron Island, Qld. 16–17 m depths on the bryozoan *Pleurotoichus clathratus* (HARMER) (NOBLE & MILLAR, 17. xi. 1983. MELU, A35366. Tetrasporic).

3) Wistari Reef, Qld. 9–10 m deep midway along the northeastern reef face on *Laurencia brongniartii* J. AGARDH and *Chondrococcus hornemannii* (LYNGBYE) SCHMITZ (KRAFT & O'BRIEN, August 1978. MELU, A35372. Cystocarpic, tetrasporic); 18–20 m deep on *Chondria dangeardii* Dawson (KRAFT & HAUSER, 19.xi.1979. MELU, A35205–35208. Cystocarpic, spermatangial and tetrasporic).

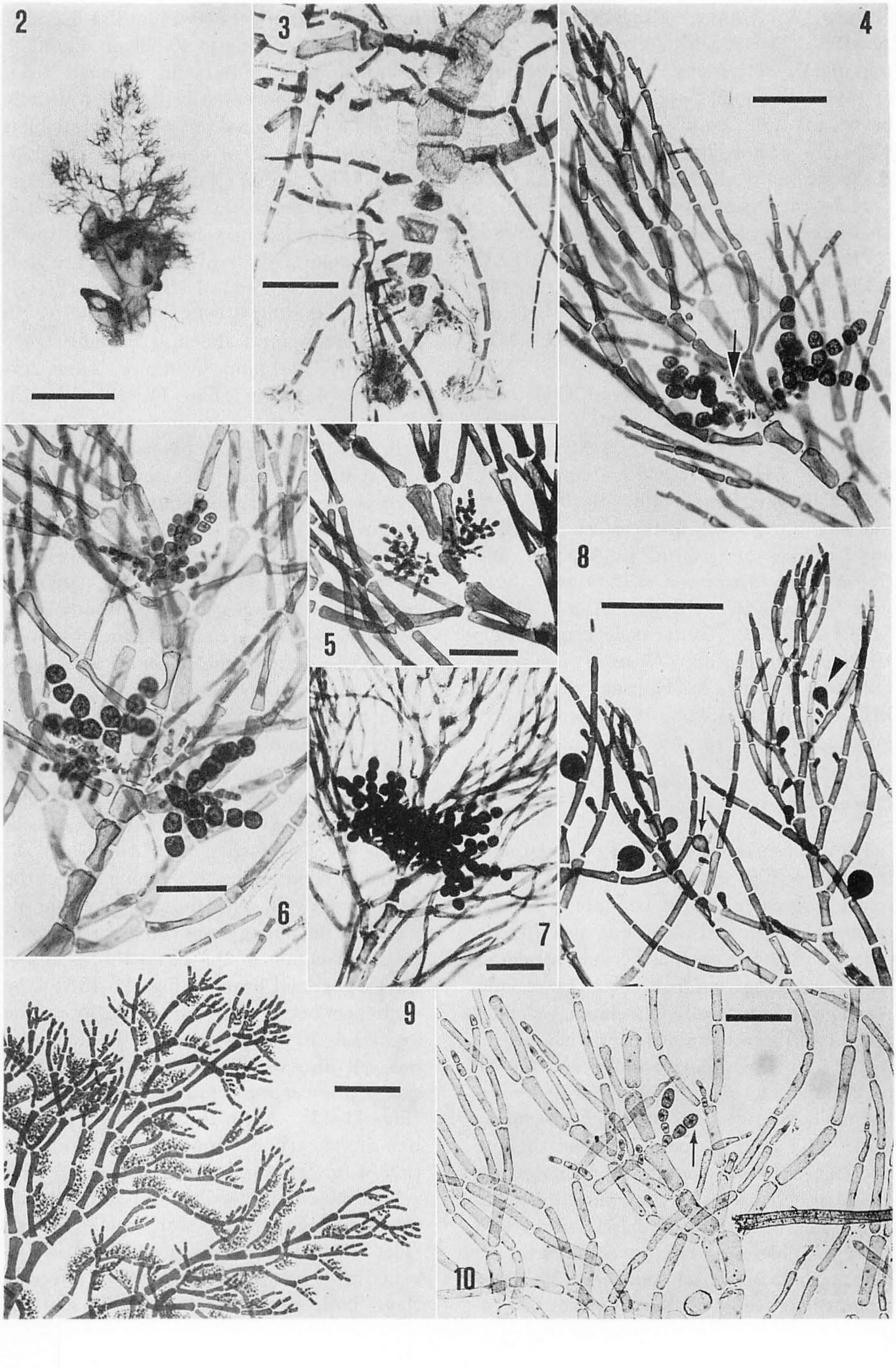
Observations

Plants of *S. orientalis* are often pyramidal in outline (Fig. 2) and generally occur in sparse aggregates, most commonly as epiphytes of larger red algae but also directly on hard substrata such as hermatypic corals and encrusting or fruticulose bryozoans. Anchorage is generally by relatively slender (12–30(–40) μm diam.) rhizoids issuing directly from the squarish lower cells of the main axis (Fig. 3). The tips of lower determinate laterals also contribute to securing the thalli, as these often become digitate and form secondary holdfasts. Some plants are attached exclusively by such lower laterals, in which cases the bases usually lack the cuboidal lower cells of complete main axes. Squarish basal cells are 150–180 $\times$ 120–210 μm, cells of the main axes becoming rectilinear above (80–140 $\times$ 350–600 μm) and distally tapering to 40–70 μm diam.

Branching is radial and alternate from all but the hypogenous cells, which usually initiate an additional one or two branchlets during the course of gonimoblast development (Figs 16, 17), and occasionally the axial cell immediately distal to the fertile axial cell, which may bear a single subsidiary filament. Lateral branchlets are simple or subdichotomously branched (Figs 4, 8, 9, 11), the distal cells tapering to 20–30 μm in diam. and the apices being fairly uniformly 10–15 μm in diam., often terminating in hairs (Figs 11, 18) 3 μm in diam. by up to 90 μm in length. Apical cells divide mostly transversely (Fig. 11) but at times also by slightly oblique walls. Vegetative cells throughout the thalli are uninucleate.

Procarps differentiate within 5 cells of the apices of fertile indeterminate axes, but carpogonial branches with apparently functional trichogynes are rare. More than two viable or aborted procarps tend to develop on a given indeterminate axis, but more than two cystocarps per such axes (Fig. 6) have not been observed.

Structure of the procarps appears to be very precise and uniform. The supporting, basal, subhypogynous and hypogynous cells of the 4-celled carpogonial branch are directed at right angles to the long axis of the fertile axial cell, with the carpogonium situated on the hypogynous cell at right angles to the direction of the basal three cells of the carpogonial branch (Figs 11–13). The subhypogynous cell is pyramidal in outline and forms an oblique angle to the hypogynous cell into which one angular proximal side of the carpogonium precisely dovetails (Figs 11–13). With the apparent fertilization of the carpogonium and the disintegration of the trichogyne, a second pericentral cell forms on the fertile axial cell opposite the supporting cell of the carpogonial branch (Fig. 13). Immediate postfertilization events have not been seen, but at an early stage both pericentral cells have cut off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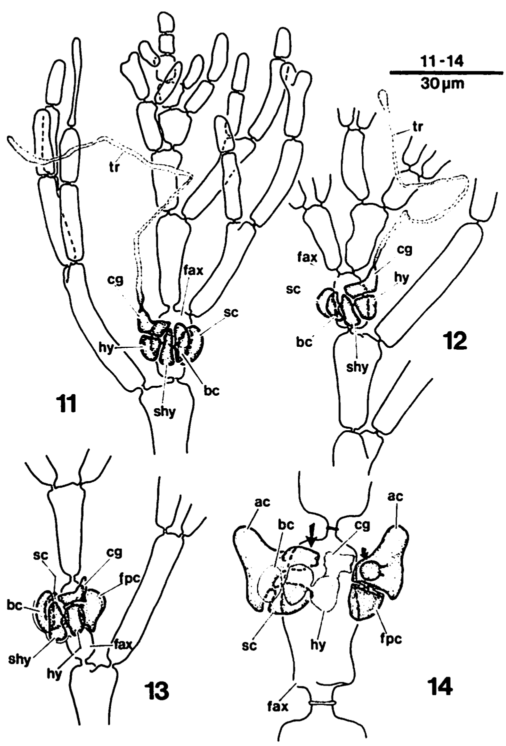
campanulate auxiliary cells (Figs 14, 15) and the carpogonium and hypogynous cells have largely fused following the cutting off of two connecting cells from the carpogonium (Fig. 14). The connecting cell linking the carpogonium and the first auxiliary cell (the one borne on the supporting cell) apparently fuses to the auxiliary cell more completely than the connecting cell linking the carpogonium to the second auxiliary cell (Figs 14, 15). In each pair of con-

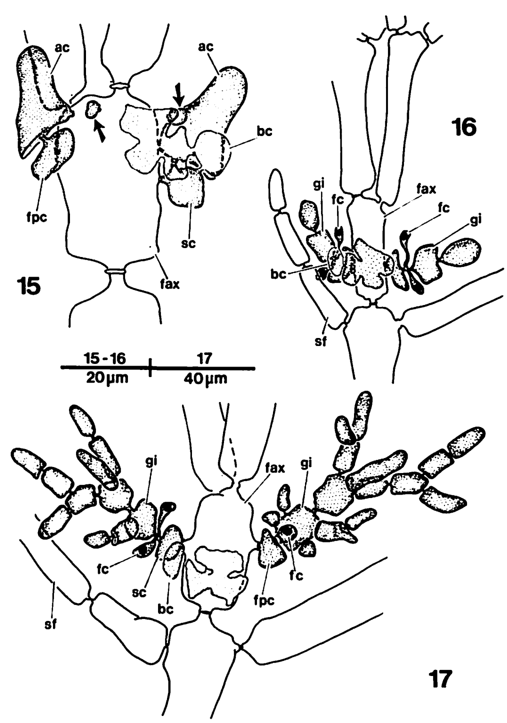


Figs 11–14. *Seirospora orientalis*, sp. nov.(MELU, A35368).

11, 12. Complete procarps with apparently functional trichogynes.

13. Formation of second fertile pericentral cell (fpc) following apparent fertilization of carpogonium.

14. Division of supporting cell (sc) and fertile pericentral cell (fpc) to form auxiliary cells (ac). Auxiliary cells have fused to connecting cells (arrows), and remnants of the carpogonium and hypogynous cells have also fused.



Figs 15–17. *Seirospora orientalis*, sp. nov.(MELU, A35368).

15. Association of auxiliary cells (ac) with connecting cells (arrows) and fusion of all but the basal cell of the carpogonial branch.

16. Division of auxiliary cell into distal gonimoblast initial (gi) and basal foot cell (fc).

17. Early development of branched gonimolobes from gonimoblast initials (gi). Foot cells (fc) contain prominent double nuclei and all but basal cell of carpogonial branch have fused.

Figs 2–9: *Seirospora orientalis*, sp. nov. (Figs 2–7, 9: MELU, A35368; Fig. 8: MELU A35370).

2. Herbarium-mounted holotype specimen. Scale = 5 mm.
3. Anchoring rhizoids and cuboidal cells at base of main axis. Scale = 200 µm.
4. Distal portion of main axis, the carposporophyte bearing two mature and one immature (arrow) gonimolobes. Scale = 100 µm.
5. Early stage in development of branched gonimoblasts. Scale = 100 µm.
6. Axis with two carposporophytes. Scale = 100 µm.
7. Appearance of mature carposporophyte. Scale = 200 µm.
8. Distal tetrasporangial axes, some cells bearing two (arrow) or three (arrowhead) tetrasporangial primordia. Scale = 200 µm.
9. Habit of spermatangial axes. Scale = 100 µm.

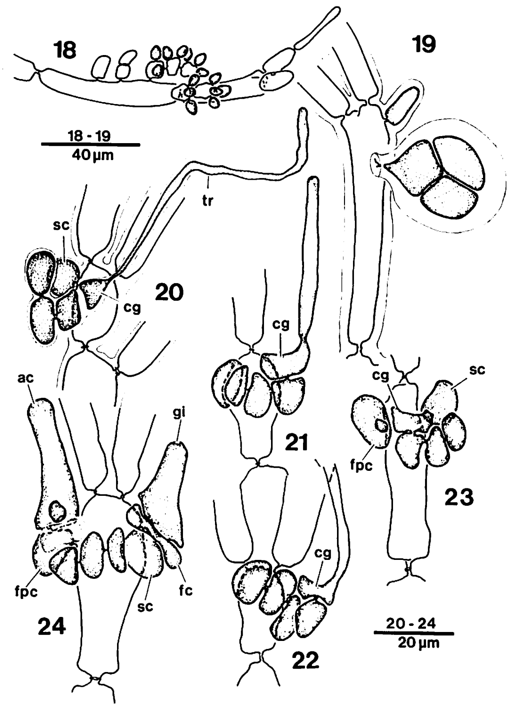
Fig. 10. *Seirospora occidentalis* Boergesen. US JN 6348 (Norris & Bucher 1982, p. 205). Habit of thallus with seirosporangia (arrow). Scale = 100 µm.

necting cell fusions, one appears to take place at the lower border of an auxiliary cell whereas the other occurs more distally, although it does not appear to be invariable which type of fusion is associated with which auxiliary cell.

As events procede, all but the basal cell of the carpogonial branch fuse (Figs 15–17), and all cells of the branch fade and eventually disappear. Both auxiliary cells divide unevenly, the lower (or foot) cell consisting primarily of two slender lobes each containing little more than a nucleus (Figs 16, 17), the upper cell initiating the gonimoblasts. Gonimoblasts consist of irregular to subdichotomous filaments (Figs 5, 17), the subdivisions of which constitute distinct lobes of the carposporophyte that result in cystocarps composed of catenate carposporangia (Figs 4, 6, 7). Carposporangia in any given lobe develop synchronously, but lobes of carposporangia at several different rates of maturity may be present (Figs 4, 6). Carposporangia are spherical to ovoid and reach 30–40 × 35–45 μm. Mature cystocarps are laxly subtended by 1–2 subsidiary vegetative filaments arising after fertilization on the hypogenous cell (Figs 6, 16, 17).

Spermatangia are present in great numbers on 2–4-celled fertile axes borne in one or two rows on the adaxial sides of determinate laterals (Figs 9, 18). Although vegetative laterals are generally slightly forcipate (Figs 4, 8), those bearing spermatangial axes are often slightly to strongly revolute (Fig. 9). The fertile axes are generally directed towards the apex of the bearing branch and often overlap the proximal end of the contiguous bearing cell (Fig. 18). Spermatangia reach ca. 4 μm diam. and develop directly on fertile axial cells.

Tetrasporangia are always sessile and are often accompanied by a second (rarely a third) primordium (Fig. 8) which may be either distal or proximal to the tetrasporangium (Fig. 19). It is not known whether the additional primordia develop into tetrasporangia once the first tetraspores are shed, but more than one tetrasporangium per bearing cell has not been observed. Tetrasporangia divide tetrahedrally (Fig. 19), reach 65–70 μm diam., and are borne adaxially on the distal ends of lateral branch cells (Fig. 8).



Figs 18–19. *Seirospora orientalis,* sp. nov.

18. Spermatangial axes being initiated and developing on adaxial lateral branch cells (MELU, A35368).

19. Mature tetrasporangium and undeveloped primordium (MELU, A35370).

Fig. 20. *Seirospora occidentalis* BOERGESEN (US JN 6341).

20. Mature carpogonial branch with apparently functional trichogyne (tr).

Figs 21–24. *Seirospora occidentalis* BOERGESEN (MICH Wynne 8344)

21, 22. Mature procarps, the carpogonia (cg) abutting the subhypogynous cells.

Fig. 23. Postfertilization stage following cutting off of second auxiliary cell (fpc) and an associated connecting cell.

Fig. 24. Later postfertilization stage showing auxiliary cell (ac) and gonimoblast initial (gi); cells of carpogonial branch remain unfused.

Discussion

The only species of *Seirospora* to which the Great Barrier Reef material might be compared is *S. occidentalis,* originally described from the Virgin Islands (Boergesen 1909, 1917) and subsequently recorded from several Caribbean localities and southern Japan (Table 1). Caribbean and Australian specimens are all uncorticated and of similar height, occur on a variety of algal hosts, and have comparable cell dimensions. Comparison of the Australian collections with published accounts of *S. occidentalis* (Table 1) reveals, however, that there are apparently some differences between the two entities. *Seirospora orientalis* occurs on both algal and invertebrate hosts, in contrast to *S. occidentalis* from the Caribbean Sea, which is mostly recorded on species of *Gracilaria* (Taylor 1960), *Sargassum* and *Dictyota* (Norris & Bucher 1982). Branching is alternate in both species, but is reported to be also occasionally opposite (Boergesen 1917, Fig. 209) or trichotomous (Boergesen 1909, Fig. 9A) in *S. occidentalis,* conditions not yet observed in Australian and Japanese material. Both Australian and Japanese collections completely lack "seirospores", in contrast to at least some plants of Caribbean *S. occidentalis* (Fig. 10), and lower axial cells of the Barrier Reef plants can reach somewhat greater lengths (Table 1). Tetrasporangia in Caribbean *S. occidentalis* are reported to be pedicellate as well as sessile (Howe 1920), occasionally cruciately divided (Boergesen 1909), and are apparently unaccompanied by adjacent primordia formed on the bearing cell (Boergesen 1917, Fig. 210B, C), all conditions at variance with Australian and, apparently, Japanese (Itono 1977, p. 205, Fig. 41G) *Seirospora.* Perhaps as significant are differences in the configurations of cells of the procarps and early gonimoblasts in the two species. As details of procarp and gonimoblast anatomy have not been published for Caribbean *S. occidentalis,* material from Belize [housed in US, cited by Norris & Bucher (1982, p. 205)] and Guadeloupe [leg. D. Ballentyne, Wynne no. 8344, MICH, epiphytic on *Dictyota* sp.] preserved on microscope slides has been examined. The single female gametophyte from Belize (JN 6341) lacks seirospores but does have occasional opposite or unequally trichotomous branching. Although not numerous, its procarps are composed of far less angular and less regularly disposed cells (Fig. 20) than are those of *S. orientalis,* in which the carpogonium, hypogynous cell and subhypogynous cell [termed cells 4–2 in Dixon & Price (1981)] display a regular spatial pattern (Figs 11–13). Procarps in the one Guadeloupe specimen available are more uniform in cell disposition (Figs 21, 22), more angular, and closer to *S. orientalis* in shape than are procarps in the Belize specimen, but details of early gonimoblast development still display some differences from comparable stages in *S. orientalis.* Carpogonial, hypogynous and subhypogynous cells of the carpogonial branch apparently do not fuse at the time of auxiliary cell formation (Figs 23, 24) in the Guadeloupe specimen (cf. also Boergesen 1917, Fig. 211B), nor are foot cells so slender and deeply scalloped (Figs 24, 25) as they are in *S. orientalis* (Figs. 16, 17). Cells of the first gonimolobe initial in the former (Fig. 25) also flare out asymmetrically at the top, unlike similar cells in the latter (Fig. 17). Neither of the axial cells adjacent to the fertile axial cell in Wynne 8344 bears subsidiary laterals, unlike *S. orientalis* in which at least the hypogenous cell almost always does. On the other hand, the Guadeloupe specimen is regularly alternately branched and lacks "seirospores", as is typical of *S. orientalis.* It is difficult to assess the importance of the differences between Australian and Caribbean material without having a greater number of both Eastern and Western Hemisphere plants to examine. This study is based on fourteen female gametophytes collected at two localities (One Tree Island, Wistari Reef) during three months (August, October, November) in four different years (1975, 1978, 1979, 1983). Early gonimoblasts in all these specimens have a consistent morphology, but fully-formed carpogonial branches bear-

Table 1. Features of *Seirospora occidentalis* BOERGESEN, as described in various publications, compared with those of the Australian material of *Seirospora* treated in this paper. (*—Algal hosts of *S. orientalis* KRAFT, sp. nov.: *Chondria dangeardii, Chondrococcus hornemannii, Coelarthrum boergesenii, Distromium didymothrix, Galaxaura arborea, Gibsmithia larkumii, Laurencia brongniartii, Liagora* sp., *Titanophora weberae*)

	S. occidentalis Boergesen 1909	S. occidentalis Boergesen 1917	S. occidentalis Howe 1920	S. occidentalis Taylor 1960	S. "occidentalis" Itono 1971	S. "occidentalis" Itono 1977	S. orientalis Kraft
Collection localities	St Thomas; St Jan	St Thomas; St Croix	Virgin I.	Fla.;Bahamas; Virgin I.; Guadeloupe	Amami I.	Amami I.	Capricorn Group, Great Barrier Reef
Substrata	on G.blodgettii	on G.blodgettii Sarg.vulgare	—	on Gracilaria & other algae	Liagora	—	on Algae*; Bryozoans (encrusting; Pleurotoichus); Coral (Acropora); Tunicates
collection depths	27 m	27 m	—	27 m	18 m	—	9-27 m
Plant heights	1-2 cm	1-2 cm, dense bushes	—	1-2 cm	0.7 cm	—	most 5-8 mm, extreme length 2.5 cm
Basal anchorage	short thick-walled rhizoids	short thick-walled rhizoids	—	short rhizoids from basal cell	slender rhizoids, 75 um diam.	—	rhizoids 12-30(-35) mm, digitate tips
Basal cells L x W	200 um long v. thick walls (ca. 40 um thick	200 um long v. thick walls (ca. 40 um thick	—	200 um x ca. 200 um	135 um diam.	85 um diam.	140 x 110-130 um, lower cells 180 x 120-210 um
Branch pattern	illustration shows alternate & opposite	ramified on all sides	—	alternate, occ. opposite	alternate, spiral from dist. ends	alternate, branches in 1/4 spiral	alternate, spiral
main axis cells, L x W	85 um diam. x 4-5 times long	85 um diam. x 4-5 times long	—		85 um diam.	45-60 um diam. 2.5-3.5 times long	80-130 x 350-600 um main axes, 40-70 um diam. distally

ultimate branches	subdichot. above	subdichot. above	———	subdichot. in final 1-2 stages	———	———	subdichotmous
ultimate cells	8-10 um diams, can end in hair	8-10 um diams, can end in hair	———	8-10 x 2-11 um	6 um diam., hairs present	6 um diam., apical cell slightly oblique divs, hairs present	10-12 um diams, apical cell transverse to slightly oblique divisions, hairs present
G'blasts	shows all g'bl. cells same size	2 ramified moniliform threads	———	2 groups rather elongate g'blasts	———	ramified moniliform	lobes of synchronously maturing cells
Carpo-sporangia	40-42 um diam.	40-42 um diam.	———	40-42 um diam.	39-42 um diam.	———	30-38 x 45 um, spherical to oval
Sperma-tangia	uppermost & inward sides cells	uppermost & inward sides cells	———	same pos. as t'spores & s'spores	none	none	4-7 sp'tangial heads per bearing cell, adaxial, bearing-cells often revolute
Sperma-tangia	uppermost & inward sides cells	uppermost & inward sides cells	———	same pos. as t'spores & s'spores	none	none	4-7 sp'tangial heads per bearing cell, adaxial, bearing-cells often revolute
Tetra-sporangia	mostly t'hedral, occasionally cruciate	uppermost & inward-turned side of distal br. cells	T'hedral, sessile or 1-celled pedicels	on upper & distal ends	adaxial 57 um diam.	65 um diam.	adaxial, to 70 um diam., 2nd & 3rd undev. sibling primordia common
Seiro-spores	not present	18-20 um diam.	30-40 um diam.	same pos. as t'spores, simple/br. rows 3-5 cells,18-20 um diam.	not present	not present	not present

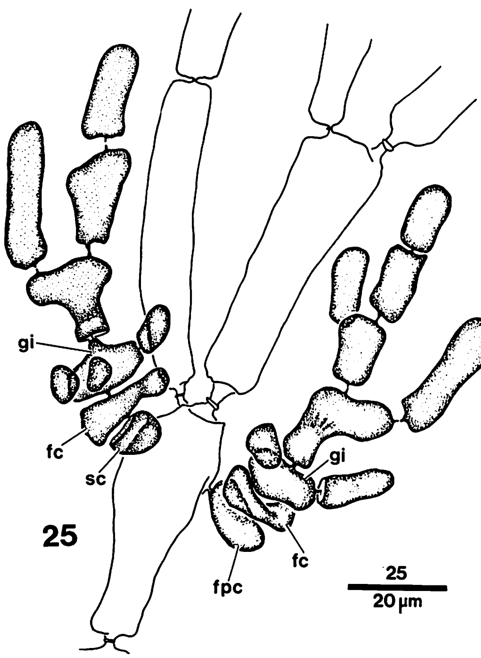


Fig. 25. *Seirospora occidentalis* BOERGESEN (MICH Wynne 8344) Early development of branched gonimolobes from gonimoblast initials (gi)
Abbreviations used in figures:
- ac=auxiliary cell
- bc=basal cell of carpogonial filament
- cg=carpogonium
- fax=fertile axial cell
- fc=foot cell
- fpc=fertile pericentral cell
- gi=gonimoblast initial
- hy=hypogynous cell
- sf=subsidiary filament
- shy=subhypogynous cell
- sc=supporting cell of carpogonial filament

ing trichogynes are present only in the November 1979 collections. Material of *S. occidentalis* is apparently very rarely collected in the Caribbean, and only the two female gametophytes described above have been available. The *Seirospora* from these two widely separated geographical regions is certainly a close match in terms of many morphological features, but until more is known of variability among populations it is proposed to treat plants from different hemispheres as representing distinct taxa.

The procarp cell pattern in *S. orientalis* corresponds to the *"Callithamnion corymbosum"* type designated by MIRANDA [1934, reproduced as Fig. 4A in DIXON & PRICE (1981)]. DIXON & PRICE (1981) observed differences in "cell spatial arrangements and alignment in the carpogonial branch" in British species of *Callithamnion*, a genus with the exact procarp cell composition of *Seirospora*. DIXON & PRICE discounted this feature as a "principal distinguishing" character of species, arguing that "sizes and shapes of carpogonia, trichogynes, and other cells of the procarp all appear too variable to be of taxonomic value at the species level." Such variation in cell orientation is well illustrated for *Callithamnion cordatum* by SCHNEIDER (1980, Figs 9–11), and seems to be a feature of Caribbean *Seirospora occidentalis*. Given that so few procarps in the *orientalis/occidentalis* suite of specimens produce trichogynes, it may be that at least some of the variation reflects the aftermath of non-viability, the cells of such procarps perhaps losing their angularity and precise orientation.

Illustrations of Japanese material (ITONO 1977, Figs 19E, 62G) are not given at a scale that permits accurate assessment of cell outlines and alignments in the procarp, although ITONO describes them to be of the *corymbosum* type. In view of the fact that differences between Australian and Caribbean plants otherwise seem to apply equally to ITONO's reports of Japanese material (Table 1), it appears likely that the latter represents *S. orientalis* rather than *S. occidentalis*.

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Gerald T. KRAFT：グレートバーリアリーフ産 *Seirospora orientalis*（新種）について

南部グレートバーリアリーフの水深 10〜27 m から種々の藻類，無脊椎動物に着生した *Seirospora* の一種を得た。catenate paraspore (seirospore) の欠除，分枝のパターンおよび procarp の構造から，このオーストラリア産の藻類は明らかに *S. occidentalis* BOERGESEN と区別され，*S. orientalis* KRAFT として新種記載された。日本から *S. occidentalis* として報告されている藻類は本種 *S. orientalis* と考えられる。(School of Botany, University of Melbourne)