

COMMONWEALTH OF AUSTRALIA

Copyright Regulations 1969

WARNING

This material has been reproduced and communicated to you by or on behalf of
The University of Adelaide pursuant to Part VB of the Copyright Act 1968 (the Act).

The material in this communication may be subject to copyright under the Act.
Any further reproduction or communication of this material by you may be the
subject of copyright protection under the Act.

Do not remove this notice.

External Copyright permission (if applicable)

Sargassum vestitum (R. Brown ex Turner) C. Agardh 1821: 24; 1824: 302. J. Agardh 1848: 298; 1872: 68; 1889: 70, pl. 21 (I). De Toni 1895: 31. Grunow 1915: 359.

PLATE 4.

Fucus vestitus R. Brown ex Turner 1811: pl. 177.

Carpacanthus vestitus (R. Br. ex Turner) Kuetzing 1849: 625; 1861, pl. 45.

Sargassum rhyncophorum J. Agardh 1889: 71, pl. 22 (II) De Toni 1895: 31. Grunow 1915: 359.

Stem terete, simple or branched, to 4 cm. long, arising from a conical holdfast. Basal leaves to 10 cm long, $\frac{1}{2}$ - $1\frac{1}{2}$ cm broad, smooth, margins entire. Branch axes slender to moderately robust, triquetrous, branches more or less retroflex. Branches to 40 cm long. Upper leaves distinctly smaller than basal leaves, grading in young fronds; leaves often largely shed from older fertile branches; upper leaves to 4 cm long, 1-3 mm broad, smooth, entire. Vesicles usually absent, on occasional plants profuse, clustered, ovoid with tapering ends, to 8 mm long and 4 mm broad, with a small apical micro. Receptacles compressed, occasionally somewhat triquetrous, with prominent spines on the upper half, especially at the apex. Conceptacles bisexual.

Type Locality: Kents Islands, Bass Strait.

Lectotype: BM.

Distribution: Around Tasmania, Kents Island, and from Robe in South Australia to Sorrento in Victoria. Common just below low tide level and in low rock pools.

Type material exists at both BM and K, but the actual specimen figured by Turner is filed in K under S. heterophyllum with a label "Japan". Setchell, on an annotation label, has previously suggested that the labels may have been transposed. The BM specimens are labelled "The specimens returned by Mr. Turner", and as these agree well with Turner's description and figures, it seems best to select them as lectotype.

v.S. rhyncophorum J. Agardh, from Tasmania (Meredith), Lectotype No. 2021 (lower right specimen) in Herb. Agardh, LD, is a specimen of S. vestitum with vesicles. In Herb. Agardh there is only one sheet under S. rhyncophorum, with 6 fragmentary specimens on it. It is likely that 2 different species are present, but J. Agardh's description and figures mainly involve the lower two specimens, of which the right-hand one only is fertile and bears vesicles. The latter is therefore chosen as lectotype. The other specimens on the type sheet must be regarded with considerable doubt and excluded from the concept

of S. rhyncophorum. The type sheet is labelled "Browns River, Tasmania, Hb. Oldfield". The vesicles on the lectotype are young, but these, the receptacles and also the entire leaves are typical of S. vestitum. The other excluded specimens on the type sheet have dentate or serrate leaves.

The vesicles may well be produced on plants in less rough habitats or in deeper rock pools.

The Gunn specimen from Tasmania, on which Hooker and Harvey (1847: 413) based their record of S. heterophyllum (a South African species) is in K, and proves to be S. vestitum.

Sargassum biforme Sonder 1845: 51; 1846: 163; 1852: 671?
J. Agardh 1848: 301; 1872: 67; 1889: 75, pl. 23 (III). De
Toni 1895: 34. Harvey 1860: 282; Lucas 1936: 67?

PLATE 5.

Carpacanthus biforme (Sonder) Muetzing 1849: 625;
1861; pl. 44.

Stem terete, to 4 cm long. Basal leaves to 10 cm long, 1-2½ cm broad, strongly undulate - crispate, margins entire to dentate. Branch axes robust, triquetrous, branches retroflex. Branches to 30 (or more?) cm long. Upper leaves smaller, grading from the basal leaves in young fronds; uppermost leaves to 3 cm long, 1-5 mm. broad, smooth, entire to

somewhat irregularly dentate. Vesicles petiolate, spherical, 3-7 mm diameter with an apical, often leafy, mucro. Receptacles terete when young, flattened when mature, possibly triquetrous, with occasional blunt spines on the upper part; 1-2 mm long and $\frac{1}{2}$ - 1 mm broad.

Type Locality: Western Australia (Preiss)

Type: MEL.

Distribution: From Western Australia (Fremantle?) probably to the Gulf Region of South Australia.

Sargassum biforme is not a well understood species. Sonder described the receptacles as "oblongis tristiche dentatis", but in the Preiss material in MEL the receptacles are sparse, mostly young, and the older ones are flattened, with occasional blunt spines or projections on the upper part — but scarcely tristichous or triquetrous as Sonder states. I have seen few specimens which are definitely the same as Sonder's type, partly because specimens otherwise similar (with undulate - crispate, somewhat spiny, basal leaves) have rarely been collected fertile. One specimen from Rocky Point, Kangaroo Island (AD, A 2436) does show receptacles very like those of the type but becoming somewhat triquetrous in the larger ones; the basal leaves of this specimen unfortunately are lacking.

Good collections from the type locality are needed to clarify this species, but the receptacles and the undulate-crispate basal leaves appear sufficient to characterise it.

Sargassum tristichum Greville and C. Agardh ex Sonder 1845:51; 1846: 163. J. Agardh 1848: 300; 1872: 71; 1889: 76, pl. 24 (I). De Toni 1895: 35. Grunow 1915: 362.

PLATE 6.

Cystoseira tristichus Greville and C. Agardh in Greville 1830: synop. xxxiii (nomen nudum).

Carpacanthus tristichus (Grev. and Ag.) Kuetzing 1849: 622.

Carpacanthus oligophyllus Kuetzing 1849: 621; 1862: 12, pl. 37.

Stem terete, simple or branched, to 2 cm long. Basal leaves to 10 cm long, $\frac{1}{2}$ - $1\frac{1}{2}$ cm broad, smooth, margins entire. Branch axes robust, triquetrous, branches retroflex. Branches to 40 cm long. Upper leaves distinctly smaller than basal leaves, grading only in young fronds, 1-3 cm long, 1-5 (-8) mm broad, entire or with odd spines; upper leaves often completely lost from older fertile fronds. Vesicles usually only a few per plant or absent, petiolate, spherical, 3-6 mm diameter, with a small mucro (occasionally slightly leafy). Receptacles densely clustered on fertile fronds, 2-5 (-7) mm

long, about 1-1½ mm broad, strongly triquetrous with prominent spines along the ridges. Conceptacles bisexual.

Type Locality: Western Australia (Preiss)

Type: MEL.

Distribution: From Rottnest Island, Western Australia to Elliston, Eyre Peninsula in South Australia, and possibly somewhat further east. Common in rock pools and the upper sublittoral zone on the north-west coast of Eyre Peninsula.

Sonder, in providing the first valid description of S. tristichum, had a specimen of Greville's as well as the Preiss material, and both these are specifically identical.

S. lacerifolium has receptacles in general larger but otherwise rather similar to S. tristichum, but the leaves in the former are deeply incised in contrast to the usually entire leaves of S. tristichum.

Carpacanthus oligophyllus, from Kuetzing's figure, appears to agree well with S. tristichum, but C. racemosus Kuetzing (previously placed under S. tristichum) shows the incised leaves of S. lacerifolium and should probably be placed under the latter species.

Sargassum lacerifolium (Turner) C. Agardh 1821: 15; 1824: 298. J. Agardh 1848: 300; 1872: 71; 1889: 74, pl. 23 (II). De Toni 1895; 34. Grunow 1915: 361. Harvey 1862: pl. 208. Lindauer 1947: 561? Lucas 1936: 66. May 1939: 208? Sonder 1846: 162; 1852: 672. Womersley 1950: 161.

PLATE 7.

Fucus lacerifolius Turner 1811: pl. 167.

Carpacanthus lacerifolius (Turn.) Kuetzing 1849: 624; 1861, pl. 42.

Carpacanthus racemosus Kuetzing 1861: 14, pl. 45 (I)

Sargassum acanthicarpum Suhr 1836: 337, pl. 3, fig. 23.

Stem to 2 cm long, terete, simple or branched, arising from a conical holdfast to 2 cm across. Basal leaves to 10 cm long, $1\frac{1}{2}$ - $2\frac{1}{2}$ cm broad, usually slightly undulate, margins entire or more usually strongly spinous or slightly incised. Branch axes robust, triquetrous, branches retroflex. Branches to 40 cm long. Median leaves often nearly as large as basal leaves but sometimes lost, margins deeply incised; upper leaves to 8 cm long, $\frac{1}{4}$ - 1 cm broad, usually deeply incised. Vesicles often absent, sometimes moderately numerous, petiolate, spherical, to 9 mm diameter, often with a leafy mucro to 1 cm long. Receptacles 5-17 mm long, (1-) 2-3 mm broad, strongly triquetrous with prominent spines along the ridges. Conceptacles bisexual.

Type Locality: Port Dalrymple, Tasmania.

Type: BM.

Distribution: From Western Australia (Preiss) to Port Phillip, Victoria and in Tasmania. Often common in low pools and the upper sublittoral on coasts of moderate roughness in South Australia.

The large spinous, triquetrous receptacles ally S. lacerifolium with S. tristichum but the deeply incised leaves separate it well from the entire leaves of the latter. The upper leaves on fertile fronds are retained more in S. lacerifolium than in S. tristichum.

Carpacanthus racemosus Kuetzing and S. acanthicarpum Suhr (both from "Newholland") are almost certainly the same as S. lacerifolium, the figures of them showing deeply incised leaves and typical triquetrous, spiny, receptacles. The type specimens have not been seen. In MEL is a specimen elabelled S. acanthicarpum Suhr accompanied by Suhr's illustration from "Flora". This specimen, though rather inadequate, is probably S. lacerifolium. Previously both C. racemosus and S. acanthicarpum were placed under S. tristichum.

THE NEW SOUTH WALES SPECIES OF ARTHROPHYCUS.

While *Arthrophycus* is predominately a southern Australian group, two fairly well defined species (*S. globulariaefolium* (including *S. robustum*) and *S. erosum*) are known from the New South Wales coast. The former in particular is not completely typical of *Arthrophycus* and illustrates the tendency found in New South Wales species towards *Eusargassum*. May (1939) also records *S. paradoxum*, *S. fallax*, *S. laevigatum* and *S. lacerifolium*, but these records need careful checking.

Sargassum globulariaefolium J. Agardh 1889: 69, pl. 20 (III).

De Toni 1895: 30. Grunow 1915: 358. May 1939; 202.

PLATE 8.

S. robustum J. Agardh 1889: 66, pl. 19 (III). De Toni 1895: 28. Grunow 1915: 355.

Stem short, to 1 cm long, arising from a robust conical holdfast. Basal leaves to 5 cm long, $\frac{1}{2}$ - 1 cm broad, smooth, margins entire. Branch axes relatively slender, triquetrous or 4 sided, branches scarcely retroflex. Branches to 30 cm long. Upper leaves grading in size from basal leaves, often broadest in upper part of leaf and somewhat asymmetrical, 1-3 cm long, 1-4 mm broad. Vesicles apparently absent. Receptacles

terete to flattened, with irregular spines on the upper half, 2-4 mm long, about 1 mm broad.

Type Locality: Illawarra, New South Wales.

Lectotype: Herb. Agardh, LD, No. 2091.

Distribution: New South Wales (from Jervis Bay to Cape Hawke (Forster) at least).

The specimen selected as lectotype fits Agardh's description and figures better than any other in Herb. Agardh and bears mature receptacles.

S. robustum J. Agardh was originally recorded from both Western Australia (Swan River, Geographe Bay, Israelite Bay) and New South Wales. Under this species in Herb. Agardh there is only one sheet named "Sarg. robustum" without a query. J. Agardh's figure also appears to have been taken mainly from this specimen, though it has no vesicles. This sheet, No. 2015 - 2016, from "Cape Hawke, near Mount Dromedary, New South Wales, Miss Bake, misit F. de Mueller" is therefore selected as the lectotype of S. robustum. It is identical with S. globulariaefolium though the receptacles are rather young. J. Agardh's specimens from Western Australia appear to be different.

Sargassum erosum J. Agardh 1889: 74, pl. 23 (I). De Toni 1895; 33. Grunow 1915: 360. May 1939: 202.

Stem short, simple or branched, from a discoid holdfast. Basal leaves to 10 cm long, 1-1½ cm broad, smooth, the margin with scattered spines. Branch axes not robust, triquetrous, branches moderately retroflex. Branches to 40 cm long. Upper leaves grading in size from basal leaves; uppermost 1-3 cm long, 1-4 mm broad, smooth, with spinous margins. Vesicles rare ("Pyriform-elliptic, aristate - J. Agardh). Receptacles 2-4 mm long, about 1 mm broad, compressed, with irregular spines on the upper part.

Type Locality: Port Jackson, New South Wales.

Type: Herb. Agardh, LD, No. 2182.

Distribution: Only definitely known from Port Jackson, Port Stephens and Cronulla.

S. erosum is not a well understood species, though it is probably a fairly well defined one, and appears to fit *Arthrophyus* satisfactorily. The above description is based largely on good fertile specimens from Cronulla, New South Wales, which agree reasonably well with J. Agardh's description and type. The receptacles in the type are not very like J. Agardh's illustration or description, having no prominent central "midrib"; and they are more irregular with some coarse spines.

SPECIES OF ARTHROPHYCUS WHICH ARE NOMEN DUBIA.

Sargassum ensifolium (C. Agardh) J. Agardh 1848: 302.

Cystoseira ensifolia C. Agardh 1824: 288.

Type Locality: "N. Holl."

Type: Herb. Agardh, LD, No. 2170.

The type is a single specimen comprising only the basal leaves, arising from a terete stem and holdfast; no receptacles or vesicles are present. The leaves are long and slender, entire except for odd minute spines.

Since the basal leaves cannot be determined with any certainty and could belong to anyone of 3 or 4 species, the name S. ensifolium must be rejected as a nomen dubium.

The specimen from which J. Agardh drew the receptacles which he associated with S. ensifolium is not associated with basal leaves, and must be eliminated from any concept of this species.

Other references to S. ensifolium which are doubtful are —
J. Agardh 1872: 69; 1889: 73, pl. 22 (III). De Toni 1895:
33. Grunow 1915: 360.

Sargassum isophyllum (Sonder) J. Agardh 1848: 298.

S. biforme var. isophylla Sonder 1846: 163.

PLATE 9.

Type Locality: Western Australia (Preiss).

Type: MEL.

Sonder (1846) distinguished two varieties of S. biforme —

- 1) isophylla, with short branches and all leaves oblong lanceolate.
- 2) heterophylla, with lower leaves oblong, upper lanceolate linear, with long slender branches.

Specimens corresponding to these are in MEL. The var. Heterophylla is normal S. biforme, but the var isophylla is sterile and appears to be a plant in which strong development of young lateral branches has occurred in the axils of older leaves.

J. Agardh (1848) elevated Sonder's variety to specific rank, but in 1889 he mentions it only under S. ensifolium.

There is no justification for recognising var. isophylla since it is only a growth form, and in the absence of receptacles it must be rejected as a nomen dubium.

Sargassum laevigatum J. Agardh 1889: 67, pl 19 (IV). De
Toni 1895: 28. May 1939: 202?

Type Locality: Orford, Tasmania (Meredith).

Lectotype: Herb. Agardh, LD, No. 2057-2058.

J. Agardh expressed doubts in describing this species. The specimens of Meredith and Gunn from Tasmania are probably the same species, but none are properly fertile and Gunn's have no vesicles. The receptacles on the Orford specimen appear to be juvenile.

Without further examination of the type and comparisons with a range of specimens from near the type locality, the concept of this species cannot be clarified.

Sargassum membranaceum J. Agardh 1872: 68; 1889: 76, pl. 24
(II). De Toni 1895: 36. Grunow 1915: 363.

Type Locality: Tasmania (R. Gunn)

Lectotype: Herb. Agardh, LD. No. 2238.

J. Agardh (1889: 77) regarded S. membranaceum and the New Zealand S. sinclairii as comprising a group (Homophylleae) in which the branch axes were terete above, somewhat angular below, the branches scarcely retrofract, and the basal and upper leaves not markedly different. J. Agardh recognised that such species form an intermediate group between

Arthrophyceus and Eusargassum.

J. Agardh also compared S. membranaceum with S. paradoxum (and its synonyms) and his figures of leaves and receptacles could well be of female S. paradoxum.

Study of the type, and material available, is inadequate to clarify the concept of S. membranaceum at the present time.

LEGENDS FOR PLATES.

- Plate 1. S. paradoxum. Marino, S. Aust. 29.xi.1959. H.B.S.W.
(AD, A 23, 969).
- Plate 2. S. fallax. Type specimen of Sonder in MEL.
- Plate 3. S. bracteolosum. Aldinga, S. Aust. 23.xi.1958. H.B.S.W.
(AD, A 22, 028).
- Plate 4. S. vestitum. Robe, S. Aus. 20.xii.1953. H.B.S.W.
(AD, A 19, 141).
- Plate 5. S. biforme. Type sheet of Sonder in MEL.
- Plate 6. S. tristichum. Point Sinclair, S. Aust 9.ii.1954.
{H.B.S.W. (AD, A 19, 552).
- Plate 7. S. lacerifolium. Port Willunga, S. Aus. 25.x.1959.
{H.B.S.W. (AD, A 23, 958).
- Plate 8. S. globulariaefolium Jervis Bay, N.S.W. 13.viii.1959.
H.B.S.W. (AD, A 23, 140).
- Plate 9. S. isophyllum. nomen dubium. Sonder specimen in MEL.

REFERENCES

- Agardh, C.A. (1821). - "Species Algarum". Vol. 1. (Lund).
- Agardh, C.A. (1824). - "Systema Algarum". (Lund).
- Agardh, J.G. (1848). - "Species Genera et Ordines Algarum." (Lund).
- Agardh, J.G. (1872). - "Till algernes systematik. Nya bidrag. III. Acta Univ. Lund. 9: 51-71.
- Agardh, J.G. (1889). Species Sargassorum australiae. K. Svenska Vetenska Akad. Handl. 23 (3): 1-133, pl. 1-31.
- De Toni, G.B. (1895). - "Sylloge Algarum". Vol. 3. Fucoidae.
- Greville, R.K. (1830). - "Algae Britannicae" (Edinburgh).
- Grunow, A. (1915). - "Additamenta ad cognitionem Sargassorum." Verh. zool.-bot. Ges. Wien 65: 329-448.
- Grunow, A. (1916). - "Additamenta ad cognitionem Sargassorum." Verh. zool.-bot. Ges. Wien 66: 1-48, 136-85.
- Harvey, W.H. (1860). - "Algae" in J.D. Hooker: "The Botany of the Antarctic Voyage". Vol. III. Flora Tasmaniae. Pt. 2, 282-343.
- Harvey, W.H. (1862). - "Phycologia Australica" 4: pl. 181-240.
- Hooker, J.D., and Harvey, W.H. (1847). - Algae Tasmaniae. Lond. J. Bot. 6: 397-417.

- Kützing, F.T. (1849) - "Species Algarum" (Leipzig).
- Kützing, F.T. (1860).- "Tabulae Phycologicae". Vol. 10.
- Kützing, F.T. (1861).- "Tabulae Phycologicae". Vol. 11.
- Lindauer, V. (1947). - An annotated list of the brown seaweeds, Phaeophyceae, of New Zealand.
Trans. Roy. Soc. N. Zeal. 76 (4): 542-566.
- Lucas, A.H.S. (1936). "The Seaweeds of South Australia".
Part I. (Adelaide).
- May, Valerie (1939). A key to the marine algae of New South Wales. Part 2. Melanophyceae (Phaeophyceae).
Proc. Linn. Soc. N.S.W. 64: 191-215.
- Mertens, J.C. (1819). - Memoire sur plusieurs espèces de Fucus, nouvelles ou peu connues, observées dans la collection du Muséum. Mém. Mus. Hist. Nat. Paris.
5: 172-90, pl. 13-15.
- Setchell, W.A. (1931). Hong Kong seaweeds II. Hong Kong Nat.
2: 237-53.
- Setchell, W.A. (1933). - Hong Kong seaweeds III. Sargassaceae.
Hong Kong Nat. Suppl. No. 2: 33-49, pl. 3-20.
- Setchell, W.A. (1935). - Hong Kong seaweeds. IV. Sargassaceae.
Hong Kong Nat. Suppl. No. 5: 1-20, pl. 1-8.
- Sonder, O.W. (1845). - Nova algarum genera et species quas in itinere ad oras occidentales Novae Hollandiae

- collegit L. Preiss. Bot. Z. 3: 49-57.
- Sonder, O.W. (1846). - "Algae" in Lehmann, "Plantae Preissianae" 2: 148-95.
- Sonder, O.W. (1852). - Plantae Muellerianae. Algae. Linnaea 25: 657-709.
- Sonder, O.W. (1853). - Algae annis 1852 et 1853 collectae. Linnaea. 26: 506-28.
- Suhr, J.N. von (1836). - Beitrage zur algen p kunde. Flora 1836: 337-350, pl. 3,4.
- Turner, D. (1811). - "Fuci sive Plantarum Fucorum Generi a Botanicis Ascriptarum Icones Descriptiones et Historia" (London) 3: pl. 135-196.
- Womersley, H.B.S. (1950). - The marine algae of Kangaroo Island. III. List of species, 1. Trans. Roy. Soc. S. Aust. 73 (2): 137-197.
- Womersley, H.B.S. (1954). - Australian species of Sargassum subgenus Phyllotrichia. Aust. J. Bot. 2 (3): 337-354.





TYPE

Lyngbya filix Lindb. & Thiers
Cen. West. coast

by S. L. Pease

1121, 027



Sargassum brauceolanum n. sp.
 Off Snapper Pt., Abingdon, Va.
 12-20 ft. below L. W.
 23 21 1952
 Coll. V. A. W. S. P.
 Det. " 215 W. S. P.

011, 194



Sargassum vestitum (L.) Lamour.

Robt. S. Wain
U.S. Geol. Surv. Geol. Surv.
20. 10. 1913

1011. 194



Sagassum laevis Lindl. & Peck
New York, under wood
to H. B. Peck



Sargassum leucum (L.) Kunt.
Herb. Acad. Berlin
1845. No. 1000
1845. No. 1000



Sargassum laevifolium (Turn.)

Pt. Willinga, S. I.

U.S. Geol.

15 8 1934

200 4 Dec. 1934



Saxifraga hypnoides L.
Wetland, near the
C. C. Road
W. 1000 - 1051
201 9724 1000 1051



Chrysomela

1875