

ANTHO BRATTEGARDI SP.N (PORIFERA: POECILOSCLERIDA),
WITH REMARKS ON AND A KEY TO THE CLATHRIIDS
OF NORWEGIAN WATERS

SARSIA

R.W.M. VAN SOEST & S.M. STONE



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Recent collecting of sponges in the Bergen area yielded a new species of *Antho*, showing similarity to the Californian *Jia jia* DE LAUBENFELS, 1930, and some other interesting clathriid sponges. The genus *Jia* DE LAUBENFELS, 1930 is here synonymized with *Antho* GRAY, 1867. The name 'croca' is proposed for the unusual J-shaped spicule type found in the Californian species and in the new Norwegian species. *Clathria ctenichela* (ALANDER, 1942) and *C. armata* (BOWERBANK, 1866) are recorded new to the Norwegian fauna. The Norwegian clathriids are discussed and some nomenclatorial changes are proposed. A key to the Norwegian clathriids concludes the paper.

R.W.M. van Soest, Institute of Taxonomic Zoology, University of Amsterdam, P.O.Box 20125, 1000 HC Amsterdam, the Netherlands. - S.M. Stone, British Museum (Natural History), Cromwell Road, London SW7 5BD, Great Britain.

INTRODUCTION

The Norwegian sponge fauna has been largely ignored for the past 50 years, possibly because it was assumed to be well-known after extensive taxonomic treatments of North Atlantic sponges by LUNDBECK (1902, 1905, 1910), HENTSCHEL (1929), BURTON (1930), and ARNDT (1935). Recent collecting activities (August, 1982) by a group of European sponge taxonomists, however, revealed many new records and encountered not a few taxonomic problems. The present paper is a contribution towards improving our knowledge of Norwegian sponges in the general framework of heightened international efforts to solve the taxonomic problems remaining in European sponges.

The Clathriidae (Microcionidae of authors) are a family of poecilosclerid sponges left untreated by LUNDBECK (l.c.), whose extensive dealings with other North European poecilosclerids took care of most regional taxonomic problems in this order. BURTON (1930) summarized the species known from Norwegian waters. For clathriids his list reads: *Dictyoclathria* (= *Antho*) *dichotoma* (ESPER, 1794), *Ophlitaspongia* (= *Clathria*) *basifixa* TOPSENT, 1913, *Artemisina arciger* (SCHMIDT, 1875), *Artemisina* (= *Clathria*) *foliata* (BOWERBANK, 1874), *Hymantho* (= *Clathria*) *normani* BURTON, 1930, *Hymantho* (= *Clathria*) *bitoxa* BURTON, 1930, and *Paresperia intermedia* BURTON, 1930 (which is not a clathriid, see

below). He apparently overlooked *Microcionia* (= *Clathria*) *dianae* (SCHMIDT, 1875). *Paresperia intermedia* (holotype BMNH 1910:1:1:912) was assigned to the Clathriidae by BURTON (1930). Subsequent reexamination revealed that it has a unispicular reticulation of acanthostyles and palmate isochelae; it is close to *Esperiopsis* of the family Desmacidonidae.

Three of the above-mentioned species were again found by us, viz. *Antho dichotoma*, *Clathria barleei* (= *C. foliata*) and *C. basifixa*. Furthermore, three species not on BURTON's list were also collected: *Clathria ctenichela* (ALANDER, 1942), *Clathria armata* (BOWERBANK, 1866) and an undescribed species of *Antho*.

MATERIAL AND METHODS

Sponges were collected by snorkeling, SCUBA-diving and dredging in the Bergen area, covering a depth range of 0-600 m. Participants in these collecting activities were Ms Wallie de Weerdt, Ms Mariëes Wapstra, Dr Ole Tendal, and ourselves. Material described below and all other collected specimens (together belonging to approximately 100 species) have been equally divided between three institutions: the Zoologisch Museum Amsterdam (ZMA), the British Museum (Natural History) London (BMNH), and the Zoologisk Museum København (ZMUC), where they have been incorporated in their respective sponge collections. Methods employed in dealing with the specimens are the same as described in BUIZER & VAN SOEST (1977).

SYSTEMATIC DESCRIPTIONS

Family Clathriidae HENTSCHEL, 1923

Definition. Clathriidae constitute all sponges with a skeleton composed of ectosomal subtylostyles (arranged tangentially or in more or less elaborate spicule brushes) and choanosomal styles or strongyles (arranged erect on the substrate or in spongin-reinforced, often reticulate tracts); microscleres normally include palmate isochelae and toxa, but these may be absent; quite typically, a smaller category of wholly spined styles are present, standing erect on the substrate or echinating the skeletal tracts (they may be also partly or wholly smooth, rare or absent).

Genus *Antho* GRAY, 1867

Antho brattegardii sp.n.

Holotype. ZMA Por. 5190, N of Björöy, 60°20' N, 05°10'30" E, dredged at 35–45 m; bottom few large stones, exposed, occasional strong currents; 13 Aug. 1982.
Schizotype. BMNH 1982:9:6:1.

DESCRIPTION

Figs 1–3.

Shape, size, and consistency. Thinly incrusting on barnacles; surface microhispid, oscules not apparent; size several mm², uniformly about 1 mm thick; consistency fragile, crumbly.

Colour. Orange (cream in alcohol).

Ectosome. Hispid due to large choanosomal styles

piercing the dermis, which is strengthened by tangential bundles of subtylostyles.

Choanosome. A basal anisotropic reticulation of acanthostrongyles forming a rectangular mesh; sides of mesh of unequal length, i.e. ascending primary tracts composed of 2 or 3 smaller acanthostrongyles, reinforced by long overlapping styles, connected by 1 or 2 larger acanthostrongyles, forming the connectives, a spicule length in width; brushes of 2 or 3 larger slightly diverging smooth styles project at the surface; they are the terminal continuations of the choanosomal primary tracts, and span an askeletal zone (though filled with cells and mesohyl) covering c. 1/3 body depth, before they pierce the surface; the primary tract configuration gives a scalariform pattern to the skeleton; spongin is present at the nodes. Spicules. Ectosomal subtylostyles with microspined heads: 220–410 by 3–5 µm; choanosomal smooth styles, almost straight: 442–765 by 8 µm; choanosomal smaller styles with acanthose heads, almost straight-shafted: 160–195 by 10 µm; choanosomal acanthostrongyles of primary tracts, entirely but sparsely spined: 90–115 by 2–8 µm; choanosomal acanthostrongyles of connectives, entirely but sparsely spined, often more pronounced at the ends, very slightly curved shaft: 125–130 by 2–8 µm; palmate isochelae: 17–24 µm; toxa in two size categories: 140–160 µm and 30–40 µm; J-shaped spicules (crocae): 10–14 by 0.5 µm.

Ecology. The single specimen was scraped off barnacle-incrusted stones at 35–45 m.

Etymology. The species is named after our host, Dr. Torleiv Brattegard, Department of Marine Biology, University of Bergen.

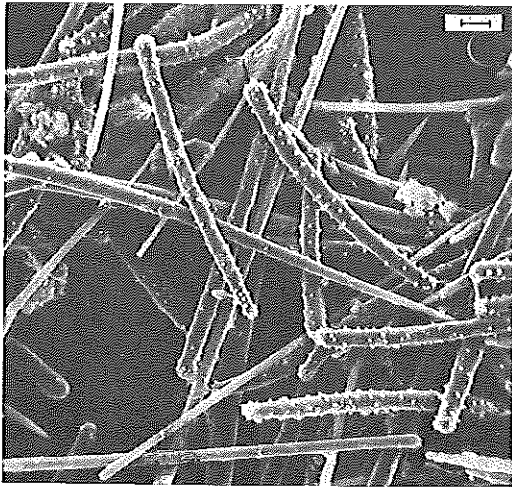


Fig. 1. *Antho brattegardii* sp.n., SEM-photo of spicule complement. (Scale = 10 µm.)

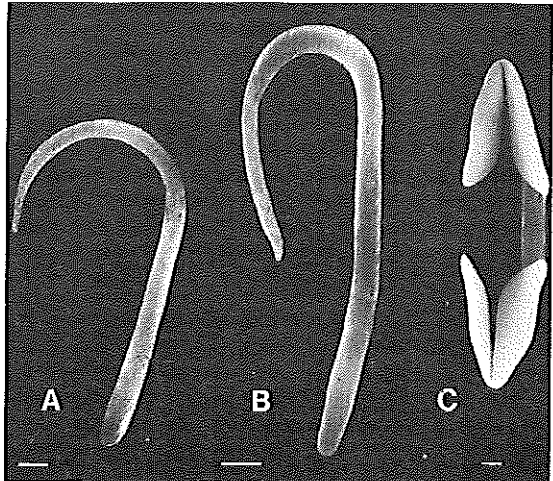


Fig. 2. *Antho brattegardii* sp.n., SEM-photo of microscleres. A-B. J-shaped microscleres (crocae). C. Isochela. (Scale = 1 µm.)

Comparison with related forms

The distinctive feature of the present species is the J-shaped spicule, for which the name 'croca' is proposed, derived from Medieval English 'crok(e)', meaning shepherd's crook, based on Scandinavian or Icelandic 'krok(r)' = hook.

Only two species are known with similar spicules, viz. *Jia jia* DE LAUBENFELS, 1930 and *Zygherpe hyaloderma* DE LAUBENFELS, 1932 sensu BAKUS (1966), both from eastern Pacific waters. The latter species is close to (if not congeneric with) *Hamacantha* (family Desmacellidae), and quite obviously unrelated to *Antho brattegardi* sp.n. The genus *Jia* DE LAUBENFELS, 1930 was founded especially on the crocae in combination with an otherwise clathriid spicule complement. We do not think that the crocae constitute a generic character in spite of the fact that a second species with approximately the same spicule complement has now been found. In other characters, such as the architecture of the skeleton, both species agree with *Antho* and neither can be differentiated from the remaining species of that genus. It is proposed here to synonymize *Jia* with *Antho*. The Californian species, of which a slide made from the holotype (USNM 21510) was kindly sent on loan by Dr K. Rützler, differs from its Norwegian relative mostly in the sizes of the different spicules; for details see Table 1. A paratype is preserved in the British Museum (Natural History) (1928:8:22:30); its skeleton shows an ill-developed reticulation of predominantly smooth styles, not unlike that of *Antho dichotoma* (ESPER, 1794).

A species extremely close to *A. brattegardi* sp.n., if we disregard the crocae, is *A. coriacea* (BOWERBANK, 1866) (type of the genus *Plocamilla* TOPSENT, 1928). It is a red, orange or yellow, thinly incrusting sponge occurring on the Atlantic coasts of Europe (ARNDT 1935) (not: Iceland, cf. BURTON 1959 = *Clathria* spec.). It differs in the presence of spination on the toxa (which is also present in *A. jia*) and in the individual spicule sizes. Like our new species, *A. coriacea* shows the '*Plocamilla*'-type of skeletal specialization with reinforcing overlapping acanthostyles. In our opinion this difference between '*Plocamilla*' and *Antho* is not of generic level. However, a careful revision of 'plocamiform' clathriid genera, which differ from *Clathria* by the possession of a renieroid spicule reticulation (including *Antho*, *Plocamilla*, *Jia*, and *Heteroclathria*), is perhaps necessary as a firm basis for this conclusion.

Another related species seems to be *A. circumflexa* (LÉVI, 1960) from the south coast of Bretagne; it differs primarily in the presence of twisted chelae, a

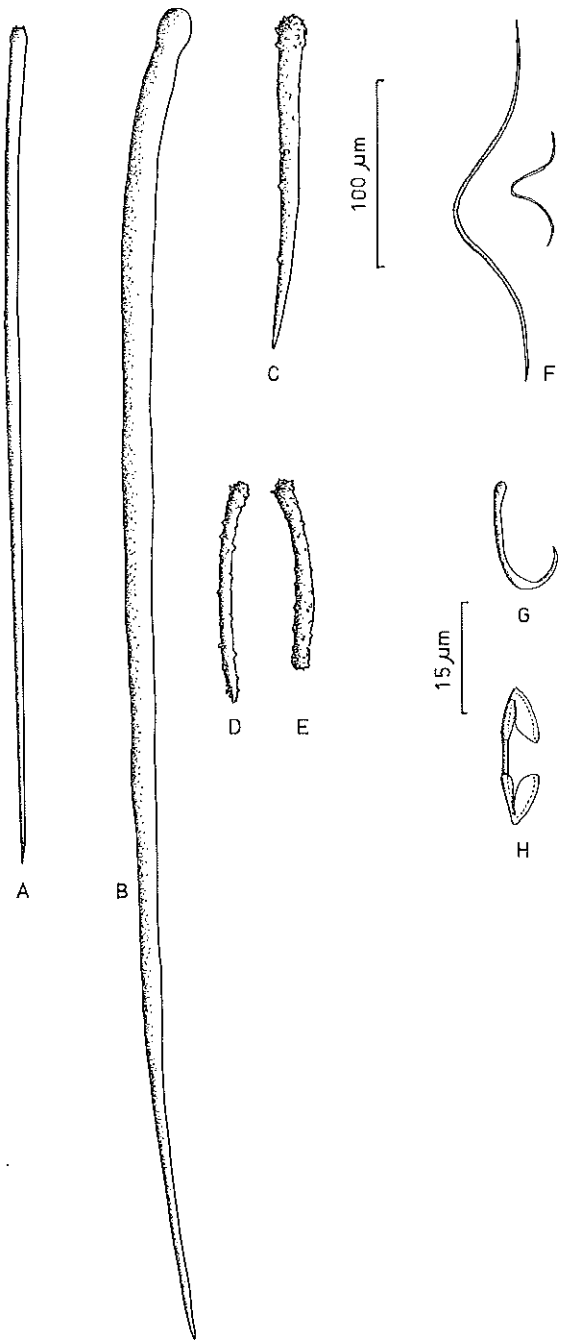


Fig. 3. *Antho brattegardi* sp.n., spicule complement. A. Ectosomal subtylostyle. B. Smooth choanosomal style. C. Reinforcing acanthostyle. D. Acanthostyle of the choanosomal reticulation. E. Acanthostyle of the choanosomal reticulation. F. Toxa. G. Croca. H. Isochela.

Table 1. Comparison of *Antho brattegardii* sp.n. and '*Jia' jia* DE LAUBENFELS, 1930.

Character	<i>A. brattegardii</i>	' <i>Jia' jia</i>
Habit	Thinly incrusting	Thinly incrusting
Colour	Yellow	?
Skeletal architecture	Basal renieroid reticulation with smooth styles reinforcing fibres	?
Ectosomal subtylostyles	220–410 by 3–5 μm microspined apices	380–570 by 4–5 μm microspined apices
Choanosomal smooth styles	442–765 by 8 μm	550 by 25 μm
Choanosomal reinforcing (acantho-)styles	195 by 10 μm acanthose	340 by 20 μm smooth
Strongyles and styles of reticulation	90–130 by 2–8 μm acanthostrongyles	260 by 15 μm smooth
Palmate isochelae	17–24 μm	27 μm
Toxa, large small	145–160 μm , smooth 30–40 μm	220 μm , acanthose apex 80 μm
Crocae (J-shaped microscleres)	10–14 μm	19–20 μm

feature shared with several other clathriids, e.g. *Plocamilla penneyi* DE LAUBENFELS, 1936), *Clathria ferrea* (DE LAUBENFELS, 1936), *C. bulbotoxa* VAN SOEST, 1984, and *Rhaphidophus cactiformis* (LAMARCK, 1814) from different parts of the world.

Antho dichotoma (ESPER, 1794)

For synonymy cf. ARNDT (1935:81) as *Dictyoclathria*.

Material. Numerous specimens from various localities in the Bergen area, generally below 100 m; substrates were *Lophelia* beds, stones, and gravel bottoms.

Comments. The species has been well-described several times. It is characterized by a thinly ramose, dichotomous habit, growing up to 30 cm high with branches about 0.5 cm in diameter. Surface hispid through protruding choanosomal styles (350–3000 by 12–18 μm). The choanosomal reticulation is made up almost entirely of smooth or barely spinous styles (150–210 by 9.5–14 μm), with rare strongylote modifications. The ectosomal subtylostyles have microspined apices and are sometimes swollen near the pointed end (size: 250–535 by 3–4 μm). Microscleres include palmate isochelae (23–28 μm , exceptionally 12 μm), and two size categories of toxa (190–305 μm with acanthose apices, and 35–95 μm). The axial part of the skeleton consists of spongin-reinforced longitudinal spicule tracts with occasional anastomoses.

Distribution. North Atlantic, from the (sub)-arctic (Kola Peninsula: KOLTUN 1959) south to

Ireland, 40–802 m. Related forms occur on the coasts of southern Europe, the Mediterranean, and West Africa, e.g. *Antho involvens* (SCHMIDT, 1864) and *A. erecta* (FERRER-HERNANDEZ, 1921). These species are characterized by a choanosomal reticulation of heavily spined acanthostrongyles and acanthostyles, but they are similar in habit. *A. involvens* is also known as thin incrustations.

Genus *Clathria* SCHMIDT, 1862

For a discussion of *Clathria* see LÉVI (1960) and VAN SOEST (1984). Incrusting forms widely known under the name *Microciona* BOWERBANK, 1863, cannot be separated generically from upright ramose *Clathria* proper. *Microciona* is used as a convenient subgeneric name.

Clathria (Microciona) ctenichela (ALANDER, 1942)

ALANDER 1942:61, pl. 15, fig. 20 (as *Microciona*).

Material. N of Lille Sotra, 60°23'54" N, 05°08'12" E, on *Lophelia* at 100 m, 13 Aug. 1982.

Description

Shape, size, and consistency. Thinly incrusting on *Lophelia* branches; surface microhispid; consistency soft, crumbly.

Colour. Red.

Ectosome. Choanosomal styles and ectosomal subtylostyles protrude beyond the dermis; ectosomal subtylostyles also strewn tangentially.

Choanosome. Leptoclathriid skeleton (cf. Lévi 1960) with choanosomal styles erect on the substrate, surrounded by acanthostyles.

Spicules. Ectosomal subtylostyles with microspined apices: 340–575 by 4–6.5 μm ; choanosomal styles with rugose heads: 665–860 by 8–11 μm ; acanthostyles: 95–160 by 5.5–9.5 μm ; palmate isochelae with inner side of the shaft ornamented by a comb-like outgrowth: 12–15 μm ; toxa: 80–220 μm . Ecology. Apparently restricted to coral beds at greater depths.

Distribution. The species was originally described from the Swedish west coast. This is the first Norwegian record. It is possibly an endemic of the North European fjord areas.

Discussion. The ctenichelate condition is found in several other clathriid species, e.g. *Microciona elliptichela* ALANDER, 1942 (which seems quite close to the present species), *Clathria simpsoni* VAN SOEST, 1984, and *Rhaphidophlus isodictyoides* VAN SOEST, 1984 (the latter two species are West Indian).

Clathria (Microciona) armata (BOWERBANK, 1866)

Microciona armata; Arndt 1935:78, fig. 159. Further synonymy citations and discussion cf. Lévi (1960).

Material. N of Lille Sotra, 60°23'54" N, 05°08'12" E, on *Lophelia* at 100 m, 13 Aug. 1982.

Description

Shape, size, and consistency. Thinly incrusting on coral branch; surface microhispid; consistency soft, easily torn.

Colour. Light-red or reddish orange.

Ectosome. Choanosomal large styles protrude beyond the dermis, which is charged with ectosomal subtylostyles confusedly arranged.

Choanosome. Leptoclathriid skeleton.

Spicules. Ectosomal subtylostyles with microspined apices: 300–450 by 3–4.5 μm ; choanosomal smooth styles with rugose heads: 250–720 by 8.5–15 μm ; acanthostyles, only slightly spined: 150–200 by 7–9 μm ; palmate isochelae: 13–18 μm ; toxa of widely varying size, not easily divisible into categories: 75–260 μm (up to 2.5 μm thick).

Ecology. The species is known from intertidal rocks down to 180 m.

Distribution. Atlantic coasts of Europe from the White Sea (78 m) into the Mediterranean. This is the first record from Norway.

Discussion. The specimen conforms to Bowerbank's type in spicule sizes with exception of the toxa (Bowerbank's measurements are: ectosomal subtylostyles 230–410 by 2 μm , choanosomal styles

350–530 by 10 μm , acanthostyles with marked spines at the head and tip 85–175 by 7–10 μm , chelae 15 μm , and toxa in two sizes c. 50 and 130 μm). From Lévi's (1960:75) table it is clear that spicule sizes in this species tend to vary considerably; the sizes in the present material fall within this large variation, but for the toxa, which are reported smaller.

Clathria (Microciona) basifixa (TOPSENT, 1913)

TOPSENT 1913: 39, pl.V, fig. 13 (as *Ophlitaspongia*).

Material. N of Lille Sotra. 60°23'54" N, 05°08'12" E, on *Lophelia* at 100 m, 13 Aug. 1982. – Marsteinsboen, on reef outside Korsfjorden, 60°07'42" N, 04°59'18" E, at 150–130 m, 23 Aug. 1982.

Description

Shape, size, and consistency. Thinly incrusting on coral branches and stones; surface microhispid; consistency soft, easily torn.

Colour. Dark brownish red.

Ectosome. Choanosomal styles protrude beyond the dermis, which is charged with ectosomal subtylostyles confusedly arranged.

Choanosome. Leptoclathriid skeleton.

Spicules. Ectosomal subtylostyles with smooth heads: 350–760 by 3–7 μm ; robust choanosomal smooth styles with smooth or slightly roughened heads: 430–1185 by 20–31 μm ; rare, possibly foreign acanthostyles: 60–100 by 2.5–3.5 μm ; shallow-curved toxa in two size categories: large robust ones (70–115 μm) and small ones (19–33 μm).

Ecology. Apparently restricted to deep waters beyond 100 m.

Distribution. Norway.

Discussion. The species was assigned to BOWERBANK'S (1866) genus *Ophlitaspongia* by TOPSENT (1913) because of the absence of chelae and acanthostyles. Both these characters are found independently in other *Clathria* species, and in view of its *Microciona*-type architecture there is no reason to exclude it from *Clathria*. The genus *Ophlitaspongia* is probably a synonym of *Clathria*, although the strictly isodictyal reticulation of the spongin skeleton in its type species *O. seriata* BOWERBANK, 1866, is certainly striking and not at all typical for *Clathria (Microciona)* species in general. The presence of rare acanthostyles in the present species is a further indication of its *Clathria* nature; it is certainly not closely related to *Ophlitaspongia seriata*.

Clathria (Clathria) barleei (BOWERBANK, 1866)

Isodictya barleei BOWERBANK, 1866. – BOWERBANK 1866: 333; BOWERBANK 1874, pl. LVII.

Halichondria foliata BOWERBANK, 1874. – BOWERBANK 1874: 198, pl. LXIII, figs 1–5.

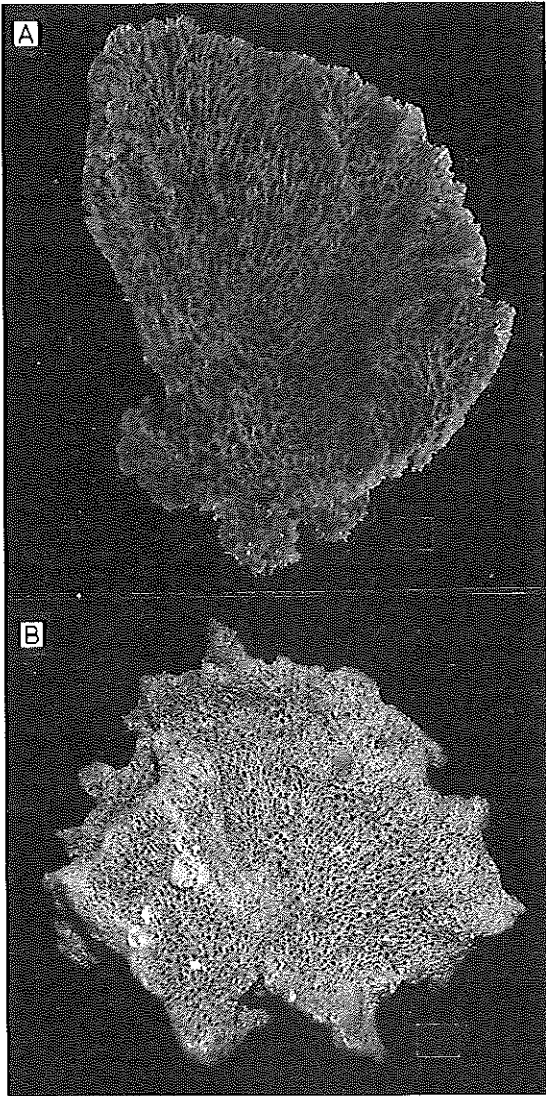


Fig. 4. *Clathria barleei* (Bowerbank, 1866) habit. A. Specimen from Norwegian waters (size 12 × 10 cm). B. Specimen from unknown North Atlantic origin, habit (size 16 × 21 cm).

Isodictya laciniosa BOWERBANK, 1874. – BOWERBANK 1874:219, pl. LXXV.
 ?*Halichondria mutula* BOWERBANK, 1874. – BOWERBANK 1874:209, pl. LXXIV, figs 4–8.
Amphilectus laciniosa; VOSMAER 1880:116.
Amphilectus foliata; VOSMAER 1880:118.
Esperia foliata; FRISTEDT 1885:41.
Tragosa barleei; TOPSENT 1894a:25.
Esperiopsis foliata; TOPSENT 1894a:26.
Homoedictya foliata; TOPSENT 1894b:12.
Echinoclathria foliata; TOPSENT 1913:38; HENSCHEL 1929:894.
Artemisina foliata; BURTON 1930:501, pl. 1, fig. 2 (with further synonyms).

Clathria laciniosa; ARNDT 1935:81, fig. 167.
Axinella barleei; ARNDT 1935:88, fig. 186.

Material. Vågegrund, N of Lille Sotra, 60°24'24" N, 05°07'06" E, on *Lophelia*, at 120–80 m, fast currents, 19 Aug. 1982.

Comments (Fig. 4). Although reported quite frequently, this species still remains ill-known, because of its apparent large variation in spicule complement. Erect, flabellate specimens looking strikingly similar in habit and macroscopical architecture, have been assigned to widely different genera, because of the rarity or absence of toxa, in *Isodictya laciniosa* BOWERBANK, 1874; acanthostyles, in *Halichondria foliata* BOWERBANK, 1874; or both these and the chelae, in *Isodictya barleei* BOWERBANK, 1866. Material assigned to *Artemisina foliata* by BURTON (1930) and to *Echinoclathria foliata* by HENSCHEL (1929) also showed a lack of spicule types, and in a specimen (Fig. 4B) of the ZMA collection (ZMA Por. 3296), of unknown North Atlantic origin, toxa were found to be very rare. In the present material (Fig. 4A) acanthostyles have not been found at all. It must be pointed out that in several clathriid genera tendencies are found to loose microscleres or acanthostyles or both, so there is nothing particularly unusual in this.

The species has been frequently assigned to *Artemisina* VOSMAER, 1885, erected for *Suberites arciger* SCHMIDT, 1875. The choanosomal skeleton in this species is confused, but the ectosome is made up of a palisade of brushes of ectosomal subtylostyles, in contrast to the more or less tangential layer of ectosomal subtylostyles in the present species. There seems to be a parallel with the relationships between *Clathria* and *Rhaphidophlus* EHLERS, 1870 (cf. LÉVI 1960; VAN SOEST 1984). Possibly, *Artemisina* will eventually be synonymized with *Rhaphidophlus*. In the meantime it seems best to refer the present species to *Clathria* (*Clathria*).

Spicule sizes in the present material: ectosomal subtylostyles with microspined heads: 260–380 by 3–5 µm; choanosomal smooth styles: 380–580 by 19–22 µm; isochelae: 18–21 µm; toxa; 265–500 µm. The species is found from the Arctic south to the west coasts of Ireland and France.

OTHER NORWEGIAN CLATHRIIDS

Several other clathriids have been described from Norwegian waters, which were not found during our recent collecting. For completeness sake they will be briefly diagnosed below.

Clathria (*Microcionia*) *normani* (BURTON, 1930). – BURTON 1930:503, fig. 1, as *Hymantho*. Leptoclathriid skeleton; subtylostyles: 210 by 2 µm; choanosomal

styles with basal tuberculations: 330 by 9 μm ; entirely spined acanthostyles: 90 by 3 μm ; toxa: 45–90 μm ; no chelae.

The genus *Hymantho* BURTON, of which the present species is the type, was erected for clathriids without chelae and with leptoclathriid skeleton. Both characters are considered to be without generic value. Norway.

Clathria (Microciona) bitoxa (BURTON, 1930). – BURTON 1930:503, fig. 2, as *Hymantho*. Leptoclathriid skeleton; subtylostyles with microspined heads: 600 by 5 μm ; choanosomal tylostyles: 900–1200 by 15 μm ; entirely spined acanthostyles: 60–100 by 6 μm ; toxa in two categories: short and stout (30–105 by 4 μm) and long and thin (150 μm). This species differs only slightly from *Clathria basifixa*. Norway and Swedish west coast.

Clathria (Microciona) diana (SCHMIDT, 1875). – SCHMIDT 1875:116, pl. 1, fig. 1, as *Suberites* (see also THIELE 1903:394, as *Microciona*). Incrusting with hispid surface; colour (dry) green. Leptoclathriid (?) skeleton; subtylostyles: 650 by 10 μm ; choanosomal acanthostyles: 110–1500 μm ; chelae: 15 μm ; toxa in two categories: 60 μm and 450 μm . This species seems also close to *C. basifixa*. Norway.

Clathria (Clathria) robusta KOLTUN, 1959. – KOLTUN 1959:186, text-fig. 147, pl. XXV, fig. 5. An upright thick branch with irregular surface. The spicules consist of the usual complement: ectosomal smooth subtylostyles: 150–270 by 5–8 μm ; choanosomal styles: 144–280 by 8–13 μm ; small echinating acanthostyles, spined only at either ends: 56–70 by 6–8 μm ; chelae: 11–14 μm ; smooth shallow-curved toxa: 120–210 μm . The species is recorded from the vicinity of Svalbard.

Artemisina arciger (SCHMIDT, 1870). – SCHMIDT, 1870:47, pl. V, fig. 6, as *Suberites*. Cushion-shaped sponge with optically smooth surface, but minutely hispid; large conspicuous chimney-like oscules. Ectosomal skeleton made up of brushes of subtylostyles which project slightly through surface: 290–400 μm ; choanosomal skeleton a confused reticulation of smooth styles: 450–700 μm ; microscleres are chelae: 7–12 μm , and toxa with acanthose apices: 70–400 μm . North Atlantic and adjacent waters north of 45° N.

KEY TO NORWEGIAN CLATHRIIDAE

1. Sponge thinly incrusting 2
- Sponge ramose, flabelliform or massive 8
2. Choanosomal skeleton includes a basal reticulation of (acantho-)strongyles or (acantho-)

- styles, and J-shaped spicules among the microscleres *Antho brattegardii*
- Choanosomal skeleton includes single megascleres erect on the substrate or united into short plumose columns 3
3. Choanosomal acanthostyles abundantly present 4
- Ckoanosomal acanthostyles absent or quite rare 7
5. Chelae ctenichelate (shaft provided with comb) *Clathria ctenichela*
- Chelae normal *Clathria armata*
6. A single category of toxa; megascleres small *Clathria normani*
- Two categories of toxa: megascleres large, robust. *Clathria bitoxa*
7. Chelae present *Clathria diana*
- Chelae absent *Clathria basifixa*
8. Sponge cushion-shaped with ectosomal spicule brushes and choanosomal spicules in confusion *Artemisina arciger*
- Sponge ramose or flabelliform 9
9. Sponge ramose 10
- Sponge thickly flabelliform with characteristic honey-combed surface ... *Clathria barleii*
10. Thinly ramose with optically hispid surface *Antho dichotoma*
- Thick branch with smooth surface *Clathria robusta*

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