

THE MARINE SHALLOW-WATER CHALINIDAE (HAPLOSCLERIDA, PORIFERA) OF THE BRITISH ISLES

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ABSTRACT

Thirteen species, including all the common ones, of marine shallow-water Chalinidae (Haplosclerida, Porifera) of the British Isles are described. Restricted synonyms and a key to the species are given.

INTRODUCTION

Haplosclerid sponges are well represented in the British and Irish coastal shallow-water area, but particularly those belonging to the family Chalinidae are very difficult to recognize at the specific and generic levels (Hiscock *et al.*, 1983 [1984]; Jones, 1984; Ackers *et al.*, 1985; de Weerd, 1985, 1986). Except for the well-known and easily recognizable species *Haliclona oculata* (Pallas), the common "Branched English Sponge" (Ellis 1755: 29), the majority of collected chalinid sponges therefore often remain unidentified. There are several reasons for this. Many haplosclerid species, especially those of the family Chalinidae, display a variety of growth forms and, to a lesser degree, of colours and consistencies. Identification on the basis of these characters, therefore, is almost impossible without a profound knowledge of the variation exhibited by each species. In itself this phenomenon is not restricted to haplosclerid sponges, but whereas in other groups there is a scale of skeletal characters available for identification, the Haplosclerida are characterized by the simplicity of the skeleton and of the spicule complement. Basically simple oxea form a reticulate pattern in which a differentiation of ascending (primary) and connecting (secondary) spicules is usually present, with different amounts of spongin. An ectosomal skeleton may be present in some species, but it is never specialized: in structure and spicules it is similar to the skeleton of the inner parts of the sponge. Microscleres, if they are present, are mainly signata or toxa, or both. Specific differences in these basic skeletal characters generally exist, but here again reliable identification is impeded by the high variation expressed by many species.

As regards the haplosclerids of the British and Irish waters, this simplicity and variation, combined with lack of information on the living animal, has given rise to a large number of specific descriptions, which are largely based on relatively

small external and internal differences. It was especially the British author Bowerbank who described the majority of the British and Irish haplosclerid sponges. He described 42 species (under the generic names *Chalina*, Chalinidae and *Isodictya*) belonging to the Haliclonidae (Bowerbank, 1866, 1874, 1882). Faced with a profusion of available specific names and the high intra-specific variation, Burton (1926a, b) lumped most of the described forms into a few, highly variable species. However, he over-emphasized the variability of the characters, and there is no doubt that he recognized a too small number of real species. It is therefore understandable that, with the rather confusing historical background of this difficult group of sponges, it is hard to identify a haplosclerid with certainty.

As part of a taxonomic revision of the North Eastern Atlantic Haplosclerida (de Weerd, 1985, 1986), the present author has made an extensive study of British and Irish Chalinidae. Freshly collected material was compared with all the available type-specimens of Bowerbank and of other authors, which are present in the British Museum (Natural History), London, and other museums. As a result of this study it is now possible to present an annotated list of chalinid species which one can expect to find around the coasts of the British Isles and to describe the variation of morphological and skeletal characters expressed by each species. Rare and uncommon species are included to attract the attention to these.

Since full synonymy lists of species and genera are presented in another paper (de Weerd, 1986), only restricted synonyms are given here. Genera are not, or only shortly, discussed. References are to good specific descriptions and figures. A key to the identification of species is given.

MATERIAL & METHODS

Fresh material was collected by the author

and others by diving, snorkeling, and shore wading during two stays at the Sherkin Marine Station, Sherkin Island, Co. Cork, (Ireland), in the early summer of 1980 and 1983, and at Lundy (Great Britain) in the summer of 1985. In addition, a collection of chalinid sponges recently collected by divers of the Marine Conservation Society (MCS) was studied. Type-specimens and other material were borrowed from or examined in the British Museum (Natural History), London (BM NH), le Muséum National d'Histoire Naturelle, Paris (MNHN), and Der Zoologisk Museum, Kobenhavn (ZMK).

SYSTEMATIC DESCRIPTIONS

Family Chalinidae Gray, 1867

Genus *Haliclona* Grant, 1835

Haliclona oculata (Pallas, 1766)
(Fig. 1; Plate 1., Plate IV, Fig. 1)

Spongia oculata Pallas, 1766: 390.

Chalina oculata; Bowerbank, 1866: 361; 1874: 169, Pl. LXVI, Figs. 1 - 3.

Isodictya varians Bowerbank, 1874: 307, Pl. LXXXVIII, Figs. 1 - 6 [non: *Isodictya varians* Bowerbank, 1866: 281; nec: Bowerbank, 1874: 124, Pl. XLVIII, Figs. 14 - 16 = *Haliclona cinerea* cf de Weerd & Stone, in prep].

Pachychalina caulifera Vosmaer, 1882: 33, pl. I, Fig. 14, Pl. III, Figs. 44 - 46; Lundbeck, 1902: 7, Pl. II, Figs 1 & 2, Pl. VIII, Figs. 4 - 6.

Haliclona oculata; Arndt, 1935: 100, Fig. 214; Hartman, 1958: 52, 85, Pls. 7 - 10; Ackers *et al.*, 1985: 177, Photographs 36 - 38.

Shape: branched, stalked. Young specimens are finger-shaped. In older sponges the branches are well developed, but they can fuse together to varying degrees: they may remain isolated along their entire length, growing from a common basal stalk, but they may also coalesce to such an extent that the shape of the sponge becomes nearly flabellate. Most common is the growth form intermediate between these two extremes. The branches have a marked tendency to be laterally compressed. Most frequently they taper gradually into blind ends; occasionally the ends of the branches are clavate. The oscula are small, with minutely elevated rims, and mainly arranged along the narrower sides of the compressed branches.

Consistency: rather soft, elastic, not fragile. Towards the base the sponge becomes firmer; the stalk is very firm and incompressible.

Surface: very smooth and velvety to touch, slightly hispid.

Colour: light brown, brown, dark-yellow, often with a greenish tinge, sometimes reddish.

Ectosome: mostly absent, but occasionally some dermal spicules are arranged in a vague, tangential isodictyal network.

Choanosome: very regular, with uni- to paucispicular primary and unispicular secondary lines.

Spongin: rather abundant, clearly visible. Towards the base it forms the main part of the skeleton.

Spicules: short, fat oxea, with gradually tapering, sharp points. Stylote and strongylote modifications are very common. Oxea are 80-120µm by 4-8µm.

Habitat: subtidal down to ca. 100m, on rocky and sandy bottom, attached to stones, *Mytilus* etc. It has a preference for localities with considerable tidal currents, with silt held in suspension. It is also found in estuaries and harbours, and can tolerate polluted and brackish water conditions.

Distribution: Arctic-boreal, circum North Atlantic. Common along the British and Irish coasts.

Haliclona urceolus (Rathke & Vahl, 1806)
(Fig. 2; Plate I, Figs. 2 & 3; Plate IV, Figs 2 - 4)

Spongia urceolus Rathke & Vahl, 1806: 42 Pl. 157, Fig. 3

Reniera urceolus; Lundbeck, 1902: 35, Pl. I, Fig. 6, Pl. XI, Fig. 1.

Adocia urceolus; Arndt, 1935: 95, Fig. 207

Haliclona urceolus; Alander, 1942: 25, Pl. 4, Fig. 2; Könnecker, 1973: 459.

Isodictya clava Bowerbank, 1866: 316; 1874: 135, Pl. LIII, Figs. 7 - 11.

Chalina pulcherrima Fristedt, 1885: 49, Pl. IV, Figs. 3a, b.

Siphonochalina pulcherrima; Lundbeck, 1902: 13 Pl. I, Figs. 3 & 4, Pl. VIII, Figs. 10 & 11.

Reniera parenchyma Lundbeck, 1902: 37, Pl. VII, Figs. 1, Pl. Figs. 2 - 4.

Haliclona pulcherrima; Alander, 1942: 24, Pl. 4, Fig. 1.

Haliclona sp. (1st); Hiscock *et al.*, 1983 [1984] 28 "Stalked tubular *Haliclona*", Ackers *et al.*, 1985: 184, Photographs 90 & 91.

Shape: basically the sponge consists of hollow, cylindrical or compressed tubes originating from a common flexible stalk. Generally the tubes end terminally in an osculum of varying width, but blind-ended tubes may be present. A few oscula at the sides of the tubes may be also present, but this is not a common feature. There is a considerable variation in the number and degree of coalescence of the tubes, and also in the length of the stalk. Young sponges are always of a very simple

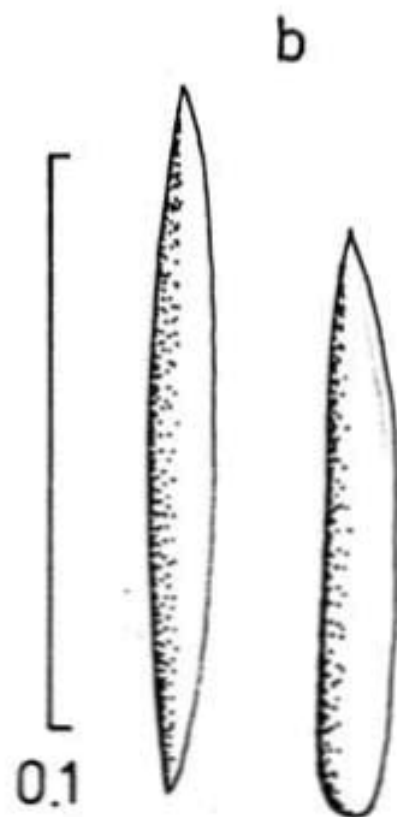
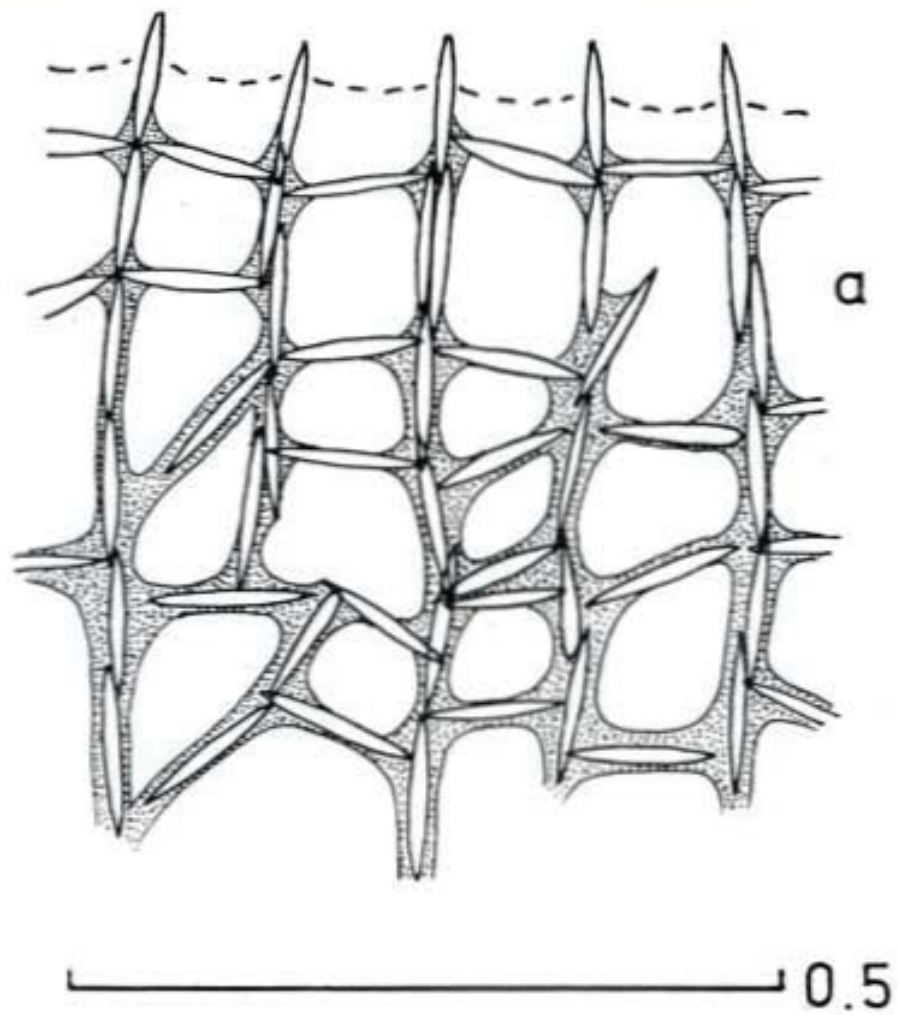


Figure 1. *Haliclona oculata*, a: cross-section of choanosomal skeleton, b: oxea (scale in mm).

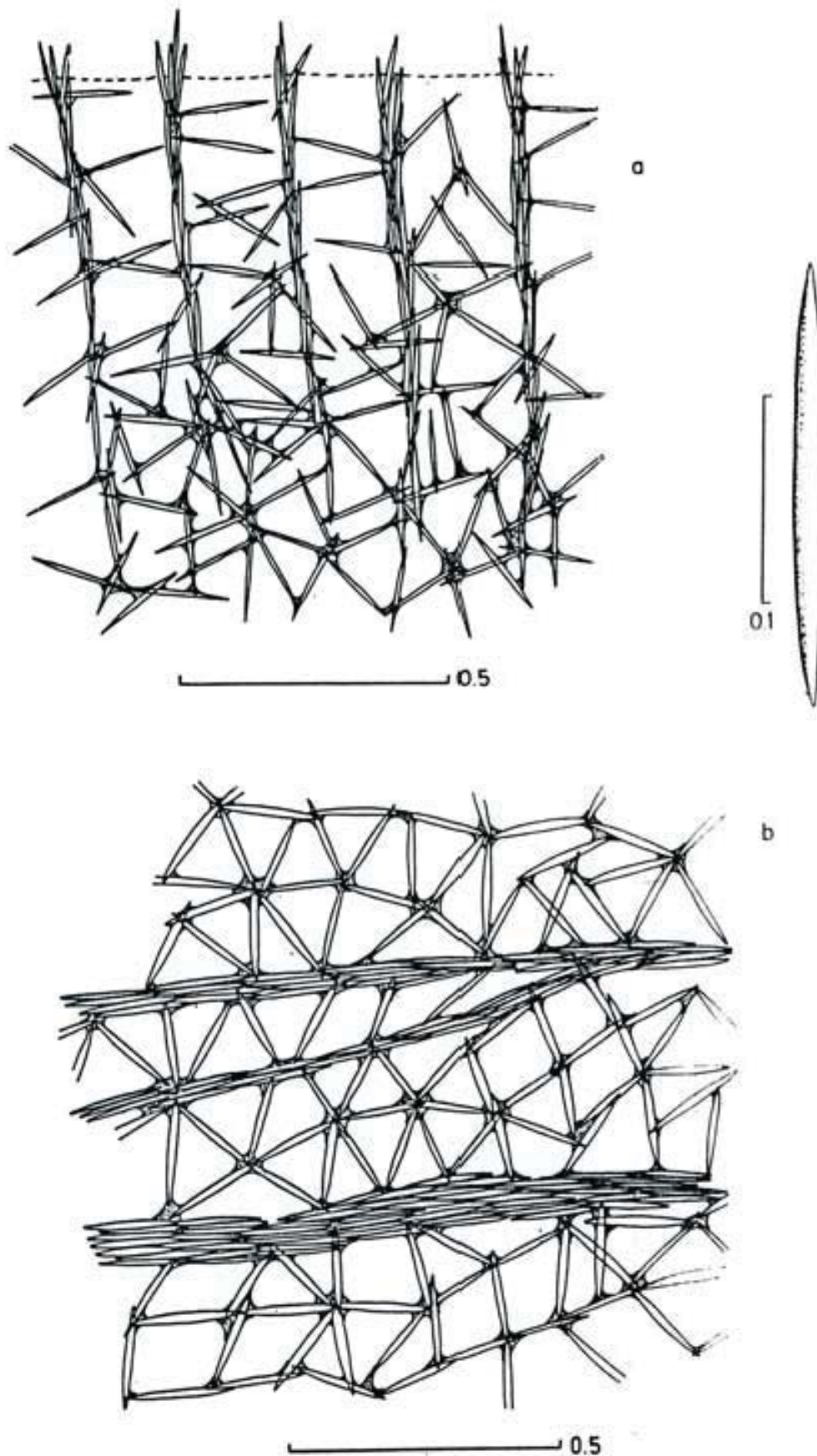


Figure 2. *Haliclona urceolus*, a: cross-section of choanosomal skeleton, b: isotropic skeleton reinforced by multispicular tracts, in older sponges, c: oxeote (scale in mm).

form, and consist of one or two, partly fused, tubes. Older specimens vary from one large (10-15cm) tube to a cluster of fused tubes.

Consistency: very soft. The larger and older the sponge, the more limp it becomes.

Surface: the surface of young, undamaged sponges is slightly velvety, smooth and minutely hispid. In older specimens the surface is less velvety and becomes more shaggy.

Colour: light brown.

Ectosome: absent.

Choanosome: basically the choanosomal skeleton is a wide-meshed and open, regular reticulation of unispicular primary and secondary lines, which in older sponges is reinforced by multispicular tracts. In small, young sponges the skeleton is more close-meshed, and the primary lines are paucispicular, especially at the periphery.

Spongin: variable. Always clearly present at the nodes of the spicules, sometimes very abundant, especially towards the inner and basal parts of the sponge.

Spicules: short-pointed, cigar-shaped oxea of variable size. Within the same individual the size is rather constant, but it seems to be influenced by temperature and/or other abiotic conditions. Southern (including the British Isles) specimens have a size range of ca. 100 - 185 by 4.5 - 8.5 μ m. Northern (arctic) specimens have a size range of ca. 180 - 240 by 8.5 - 15.5 μ m.

Habitat: Subtidal, on sediment-covered stones, etc. Commonly found in sheltered environments. To ca. 2500m.

Distribution. Arctic-boreal, southern limit probably the North West coast of Ireland and Wales, i.e. ca. 52° N. Recently found in high abundance in Loch Long and Loch Melford, Scotland, and other Scottish localities (MCS). Other recent British and Irish records are Wales and Sherkin Island (South Ireland).

Remarks: *Haliclona urceolus* was hitherto largely known as an arctic and sub-arctic species, of which the southern limit was uncertain. The species was first mentioned in the literature from Irish waters by Könnecker (1973), from Kilkieran Bay, Galway, Ireland. Although Könnecker did not describe or figure his specimens, this record is considered reliable, since he followed Arndt's description of the species (as *Adocia urceolus*), which is correct.

Recently, during the present author's study and especially through the collecting activities of the MCS a large amount of fresh material from various British and Irish localities was obtained. This material seemingly represented two species. One species consisted of erect cylindrical, smooth tubes, with a skeleton of paucispicular primary and unispicular secondary lines, and rather small spicules (see Fig. 2); sometimes the primary lines become multispicular towards the periphery (see

Plate IV, Fig. 2). This species appeared to conform to Bowerbank's *Isodictya clava*, of which I studied the original material. The other sponges, clearly belonging to *H. urceolus*, differ from these by the much softer and limper consistency, causing the sponge to collapse immediately when removed from the water. The skeleton is wider meshed and largely unispicular, and is frequently reinforced by longitudinal multispicular tracts (see Fig. 3, and Plate IV, Figs. 2 & 3). The spicules are larger. However, after closer examination of the material it has become evident that the majority of the sponges is intermediate between these two extremes. This concerns the habit, the softness, as well as the skeletal characteristics. It appeared furthermore that there is a cline, especially with respect to the size of the spicules, which seems to be correlated with geographical latitude. All the specimens of the most northern localities (Denmark, the Swedish West coast, the Norwegian and Scottish coasts, Faroe, Iceland, and Greenland) have a spicule size ranging from ca. 130 by 6.5 μ m in the more southern sponges to 240 by 15.5 μ m in the most northern sponges. The size gradually increases with increasing latitude. Specimens from South Ireland, Wales, the Netherlands (one specimen, recently collected by M. de Kluyver), and the Danish Wadden Sea have a spicule size ranging from 93 by 4.6 μ m (the Dutch sponge) to 125 by 7 μ m.

On the basis of the range of characters exhibited by the studied specimens it is concluded that only one species is involved instead of two. A more detailed treatment of the synonyms of *H. urceolus* and its geographically correlated variation is given in another paper (de Weerd, 1986).

Haliclona simulans (Johnston, 1842)

(Fig. 3, Plate II, Fig. 1a-c, Plate V, Figs. 1-3)

Halichondria simulans Johnston, 1842: 109, Pl. VIII, Figs. 1 - 6.

Isodictya simulans; Bowerbank, 1866: 308; 1874: 131, Pl. LI, Figs. 5 & 6.

Haliclona simulans; Ackers *et al.*, 1985: 179, Photographs 38 & 39.

Isodictya ingalli Bowerbank, 1874: 241, Pl. LXXVIII, Figs. 1 - 4.

Shape: polymorphic. It is found as thin, flat encrustations under intertidal rocks, with small, slightly elevated oscula at regular distances. Deeper it is repent ramose, somewhat nodulous near the oscules. Oscules are flush with the surface or slightly elevated, evenly distributed on all sides of the branches.

Consistency: firm, incompressible, corky.

Surface: smooth.

Colour: characteristic of the species are the various coloured areas of different shades of brown, yellow, orange, and even white. The colours

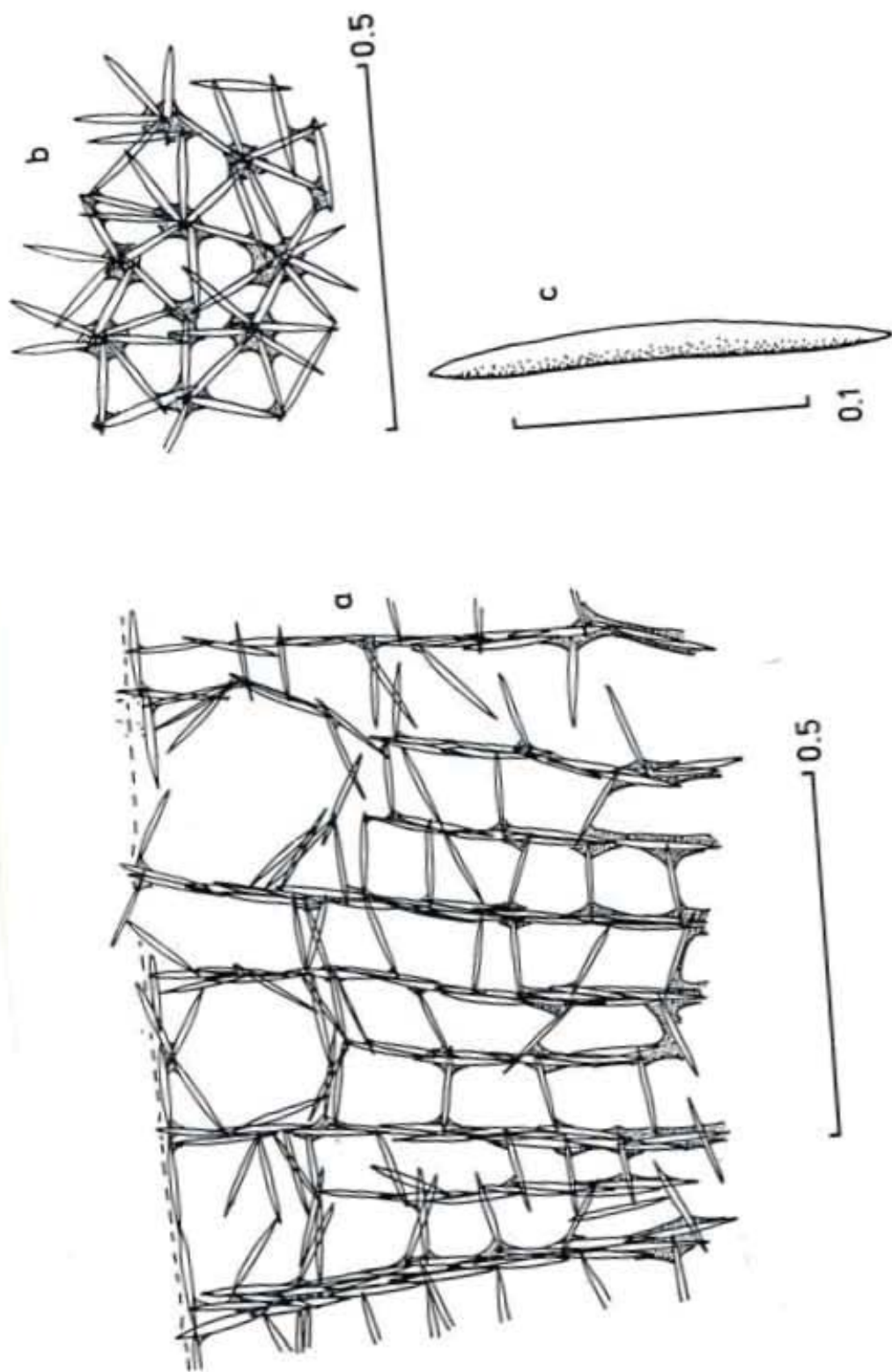


Figure 3. *Haliciona simulans*, a: cross-section of choanosomal skeleton, b: tangential view of ectosomal skeleton, c: oxeote (scale in mm).

only slightly disappear in spirit.

Ectosome: a strong, regular reticulation of single, sometimes double oxea, with three-sided meshes.

Choanosome: a rigid, close-meshed skeleton of straight, paucispicular primary lines connected by single or double secondary spicules. Many subdermal and choanosomal spaces.

Spongin: moderate to abundant, yellowish, clearly visible.

Spicules: short, fat oxea, with rather short, sharp points, 130 - 155 by 8 - 11 μ m.

Habitat: under intertidal stones and subtidal to 30m.

Distribution: Mediterranean-Atlantic. Probably rather common along the British and Irish coasts, but this needs to be established on new records.

Haliclona cinerea (Grant, 1826)

(Fig. 4; Plate 1, Figs. 4a-d; Plate IV, Figs. 5 & 6)

Spongia cinerea; Grant, 1826: 201, Pl. II, Fig. 3.

Isodictya cinerea; Bowerbank, 1866: 274; 1874: 121, Pl. XLVIII, Figs. 1 - 5.

Reniera cinerea; Stephens, 1921: 6.

Haliclona cinerea; Ackers *et al.*, 1985: 173, Photographs 94 & 97.

[non: *Reniera cinerea*; Lundbeck, 1902; nec Lundbeck, 1909 = *Haliclona rosea* (Bowerbank.)]

Halichondria montagui Fleming, 1828: 522; Johnston, 1842: 99, Pl. VI, Figs. 1 & 2.

Chalina montagui; Bowerbank, 1866: 366; 1874: 173, pl. LXVIII, Figs. 3 - 5.

Haliclona montagui; van Soest *et al.*, 1981 [1983]: 45.

[non: *Haliclona montagui*; Alander, 1942 = *Haliclona urceolus* Rathke & Vahl]

Isodictya peachii Bowerbank, 1866: 276; 1874: 123, Pl. XLVIII, Figs. 6-8.

Reniera peachii; van Soest *et al.*, 1981 [1983]: 45.

Isodictya permollis Bowerbank, 1866: 278; 1874: 123, Pl. XLVIII, Figs. 9 & 10.

Isodictya elegans Bowerbank, 1866: 283; 1874: 125, Pl. XLIX, Figs. 1 - 5; 1882: 121.

Haliclona elegans; Jones, 1984: 242

Remark: the history and synonymy of this much abused specific name is so complicated, that only the most important synonyms can be given here. A paper dealing with this species is forthcoming (de Weerd & Stone, in prep.)

Shape: this species exhibits a variety of growth forms, from thinly encrusting to complex masses of anastomosing branches. Under intertidal rocks in areas with relatively low water movement it is found as thin, flat encrustations, not exceeding

10cm in diameter, and with a few, small oscula with slightly elevated rims. In this form it is very similar to *Haliclona rosea* (Bowerbank, 1866), a species which is also variable in growth form (see also Table 1).

Under intertidal rocks in areas with strong tidal currents it is found as thicker and much larger encrustations, often covering the greater part of the stone. In this form it has a very irregular outline, with numerous tubular and fistular, highly inosculating processes. The oscules are irregularly scattered, in places flush with the surface, in places on chimney-like or conical elevations. Subtidally, often on *Laminaria* roots, it is most frequently found in the "mammillated" growth form, i.e. several volcano-shaped oscular elevations growing from a common encrusting base.

Finally, in its most delicate form, the sponge consists of a cluster of slender, again highly inosculating branches and long, fistular processes, attached intermittently to the substratum, i.e. without a large, encrusting base. Oscules are flush or slightly elevated, irregularly scattered on the branches and fistulae. This form is mostly encountered from 10 to 20m in places with strong tidal currents.

Consistency: very soft, compressible and fragile. A most conspicuous feature of this sponge are the so-called slime-strands, formed by special connective cells. The nature of these cells has been described by Topsent (1888, 1925), Tuzet (1932) and Lévi (1967). When the sponge breaks or when it is removed from the substratum, slimy threads are clearly visible (cf. also Jones, 1984).

Surface: smooth.

Colour: brown, pink, lavender, sometimes dark-purple.

Ectosome: a regular, six-angled reticulation of single spicules, at the nodes bound by a variable amount of spongin.

Choanosome: basically the skeleton consists of a regular, isotropic, unispicular reticulation of oxea with spongin at the nodes. When the spongin is more abundant the skeleton may become more irregular. In extreme cases the skeleton may partly or completely consist of spongin fibres cored by spicules of reduced size.

Spongin: variable, sometimes very abundant.

Spicules: characteristic, short, rather thick, abruptly pointed oxea, often with strongylote and/or stylote modifications, 80 - 120 by 4 - 8 μ m.

Habitat. Under intertidal stones, subtidally grow-

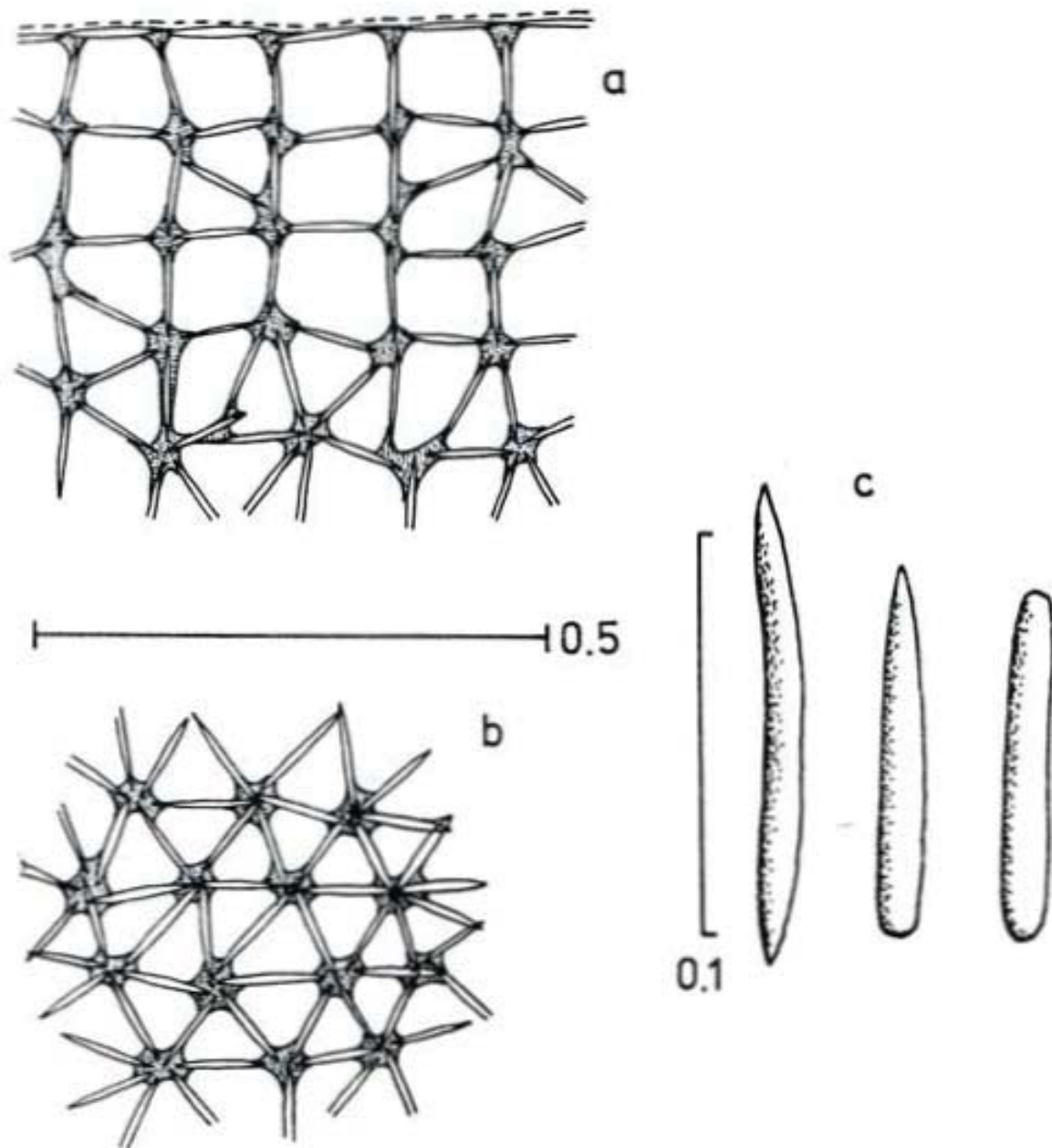


Figure 4. *Haliclona cinerea*, a: cross-section of choanosomal skeleton, b: tangential view of ectosomal skeleton, c: oxea (scale in mm).

	<i>Haliclona cinerea</i>	<i>Haliclona rosea</i>
Shape	encrusting-ramose	encrusting-cushion shaped
Consistency	soft, fragile	soft, fragile
Surface	smooth	smooth, slightly hispid
Colour	brownish-pink	brownish-pink
Slime-strands	present	absent
Ectosome	present, isotropic	absent
Choanosome	isotropic-unispicular	pauci-multispicular
Spongin	moderate-abundant	very sparse
Oxea	short, fat, short points	long, long points
Size oxea	80 - 120 by 4 - 8um	120 - 180 by 6 - 10um
Distribution	Eastern Atlantic	Arctic-boreal

Table 1. Characteristics of *Haliclona cinerea* and *Haliclona rosea*.

ing on *Laminaria* - roots, etc., to ca. 30m. The species clearly prefers sites with moderate to strong currents. In places with very strong tidal currents, for instance at the inlets of sheltered loughs, it occupies the cavities formed by the boulders and stones.

Distribution. Although the species is recorded from localities around the whole world, it is fairly certain that, on the contrary, *Haliclona cinerea* has a rather limited distribution, viz. the British Isles, Ireland, the Channel area and France, penetrating south to the Azores (de Weerd & van Soest, 1986) and West Africa (Lévi, 1956).

Concerning the occurrence on the British and Irish coasts it is difficult to make statements on the basis of recent records, since they are of uncertain reliability. On the basis of literature data and examination of museum specimens (de Weerd & Stone, in prep.) it may be concluded that the species occurs along the entire British and Irish coasts.

Haliclona viscosa (Topsent, 1888)

(Fig. 5; Plate II, Fig. 2; Plate V, Fig. 4)

Reniera viscosa Topsent, 1888: 149; van Soest & Weinberg, 1980: 8, Fig. 10; van Soest *et al.*, 1981 [1983]: 45.

Haliclona viscosa; Ackers *et al.*, 1985: 181, Photographs 93, 100 & 101.

Shape: massive, encrusting sponges with tightly-packed tubular, chimney- or volcano-shaped osculiferous elevations. Characteristically several oscula are arranged in a series of shared or unshared elevations.

Consistency: rather firm, friable, very slimy and gelatinous to the touch.

Surface: smooth, but irregular because of numerous longitudinal and transverse ridges and irregular elevations.

Colour: greyish-purple, in places often yellowish with rosy tinges.

Ectosome: absent

Choanosome: close meshed, with pauci-multispicular primary and unispicular secondary lines. Many spicules in confusion.

Spongin: very little, confined to the nodes of the spicules.

Spicules: rather slender and fusiform oxea, 110-150 by 3 - 7.5µm.

Habitat. Subtidal to 50m, on vertical sides of rocks in places with strong currents and low turbidity.

Distribution. Probably confined to the southern parts of the British Isles and the Channel area.

Remarks. In skeleton structure *Haliclona viscosa* is very similar to *Haliclona indistincta* and *Haliclo-*

na rosea. The species are, however, morphologically and ecologically well separated.

Haliclona indistincta (Bowerbank, 1866)

(Fig. 6; Plate II, Fig. 3; Plate V, Fig. 5)

Isodictya indistincta Bowerbank, 1866: 290; 1874: 131, 356, Pl. LI, Figs. 1 - 4.

Haliclona indistincta; Burton, 1947: 369 - 372.

Adoeia indistincta; Arndt, 1935: 94, Fig. 202.

Reniera indistincta; van Soest *et al.*, 1981 [1983]: 45.

Shape: thickly encrusting masses with large, slightly elevated oscula.

Consistency: soft, fragile, very friable.

Surface: somewhat irregular and shaggy, often with clearly visible exhalant canals radiating to the oscules.

Colour: greenish-brown.

Ectosome: absent.

Choanosome: close meshed, with pauci-multispicular primary and unispicular secondary lines. Many spicules in confusion.

Spongin: very little, confined to the nodes of the spicules.

Spicules: rather slender and fusiform oxea, 110 - 150 by 3 - 7.5µm.

Habitat. Commonly found on the undersides of intertidal rocks.

Distribution. Eastern Atlantic. Common along the British and Irish coasts.

Haliclona rosea (Bowerbank, 1866)

(Fig. 7; Plate II, Fig. 4; Plate V, Fig. 6)

Isodictya rosea. Bowerbank, 1866: 282; 1874: 126, Pl. XLIX, Figs. 12-14.

Keniera rosea; Jones, 1984: 242.

Halichondria mcintoshii Bowerbank, 1874: 340, Pl. XCI, Figs. 18 & 19.

Reniera tubulosa Fristedt, 1887: 419, Pl. XXIV, Fig. 1; Lundbeck, 1902: 44, Pl. III, Fig. 5, Pl. XI, Fig. 11 & 12.

Reniera laxa Lundbeck, 1902: 46, Pl. II, Fig. 6 Pl. XI, Fig. 13.

Haliclona permollis; Tendal, 1970: 8.

[non: *Reniera rosea*; Topsent, 1925 = *Haliclona mediterranea* (Griessinger)].

Shape: this species exhibits different growth forms. Under intertidal stones it may be found as a small, thinly encrusting sponge (Plate II, Fig. 4a) with one or two small and only slightly elevated oscules. Other common growth forms are thickly encrusting, cushion-shaped or irregularly massive, often with fistular processes and irregular-

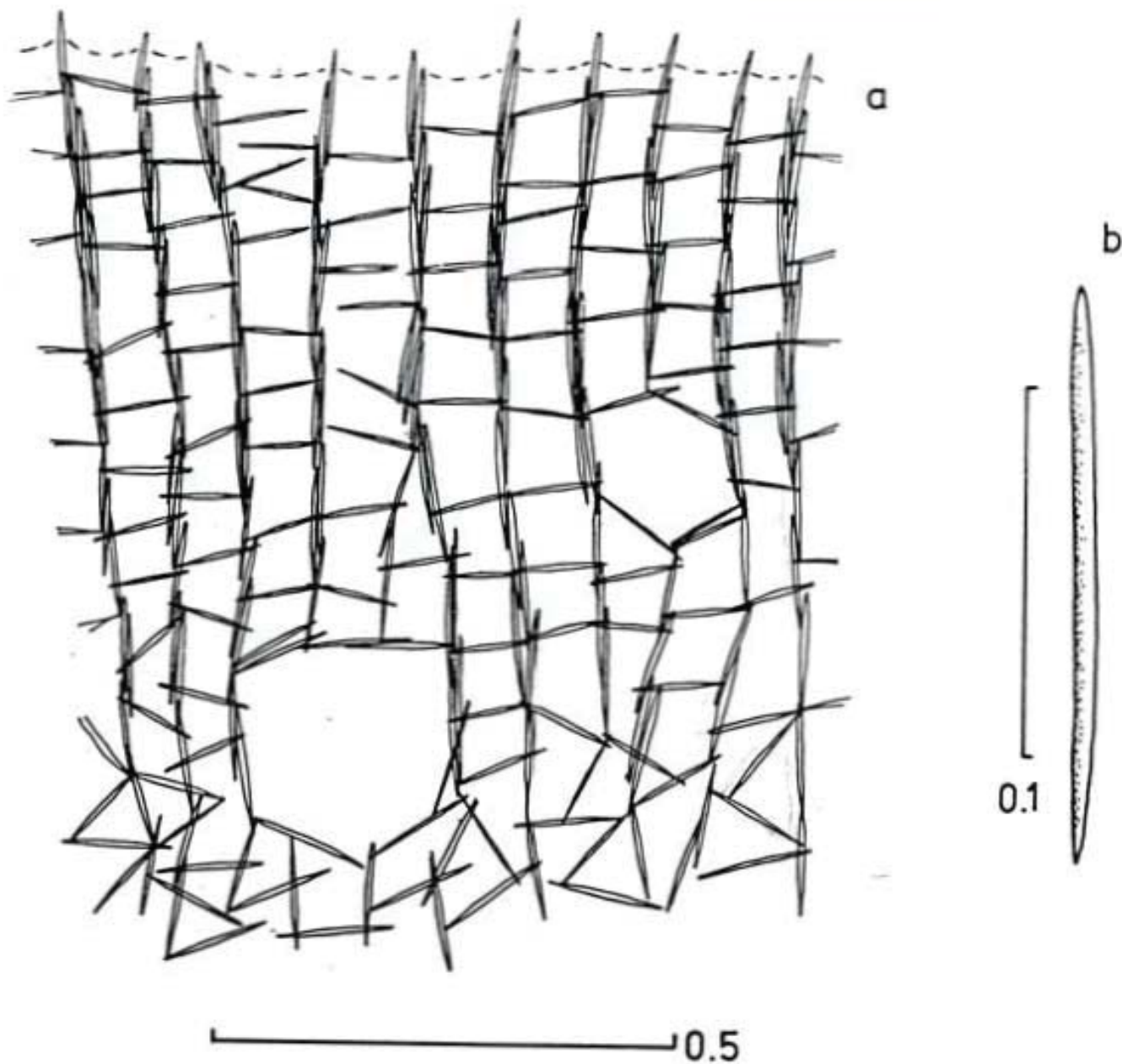


Figure 5. *Haliclona viscosa*, a: cross-section of choanosomal skeleton, b: oxeote (scale in mm).

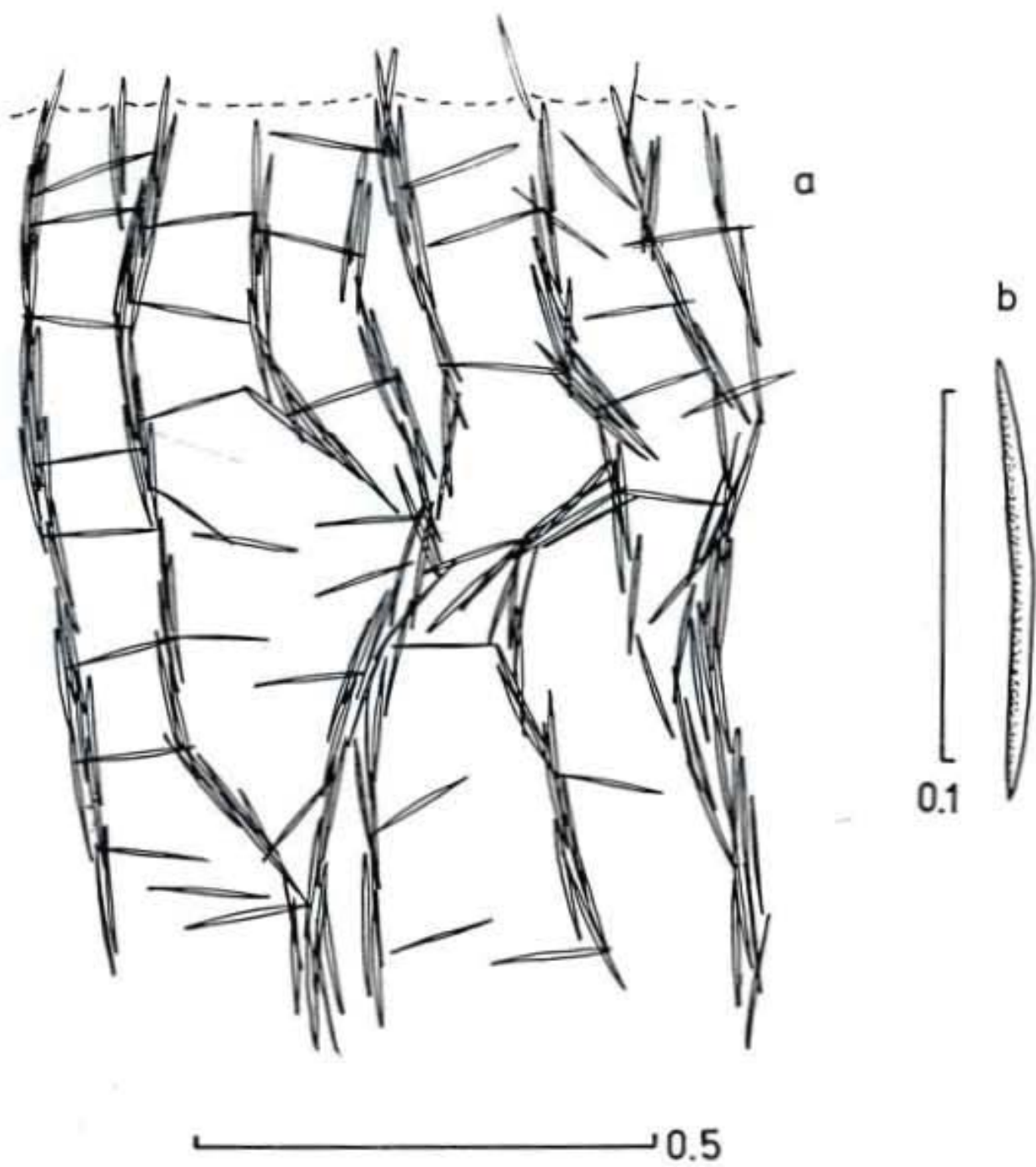


Figure 6. *Haliclona indistincta*, a: cross-section of choanosomal skeleton, b: oxete (scale in mm).

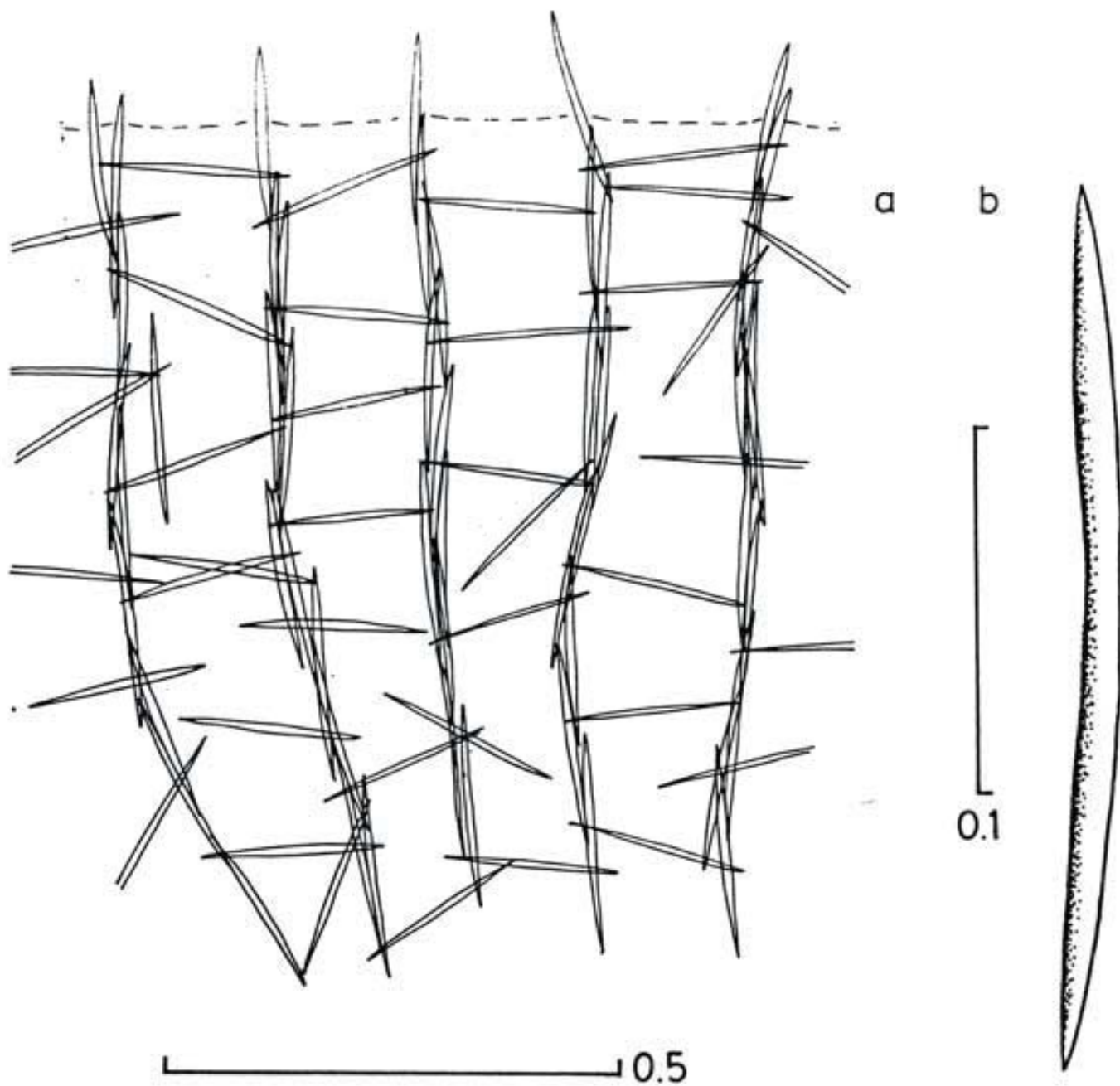


Figure 7. *Haliclona rosea*, a: cross-section of choanosomal skeleton, b: oxete (scale in mm).

ly dispersed rather large oscula and tubular oscu-
ferous elevations (Plate II, Fig. 4b).

Consistency: soft, rather fragile.

Surface: even, slightly hispid.

Colour: rose-pink, sometimes light-brown.

Ectosome: absent.

Choanosome: paucispicular primary and unispicu-
lar secondary lines. Primary lines are sometimes
wavy.

Spongin: sparse, confined to the nodes of the
spicules.

Spicules: long, rather thin oxea with long and
sharp points, 120 - 180 by 6 - 10 μ m.

Habitat. Under intertidal rocks, subtidal to 100m.

Distribution. Arctic-boreal. Reliable recent
British and Irish records are rare, but those of
Jones (1984) from Wales are certain. The species
was furthermore collected by the author and
others at Sherkin Island and Lough Ine (South
Ireland).

Remarks. *H. rosea* is easily confused with *H.*
cinerea, since both species may occur as thin,
soft, brownish-pink encrustations under intertidal
rocks. It goes beyond the purpose of the present
paper to deal with the enormous number of pos-
sibly incorrect records of both species (cf. de
Weerd & Stone, in prep.). However, to avoid
continuation of this phenomenon, it may be of
some help to tabulate the main and diagnostic
characteristics of both species (Table 1).

Haliclona fistulosa (Bowerbank, 1866)

(Fig. 8; Plate III, Fig. 1; Plate VI, Figs. 1 & 2)

Isodictya fistulosa Bowerbank, 1866: 299; 1874:
136, Pl. LIII, Figs. 15 - 17.

Isodictya mcandrewii Bowerbank, 1866: 284;
1874: 125, Pl. XLIX, Figs. 9 - 11.

Adocia fistulosa; Arndt, 1935: 42, Fig. 201.

Haliclona fistulosa; Ackers *et al.*, 1985: 175,
Photographs 96, 98 & 99.

Shape: a massive sponge with fistules and large,
few oscules with slightly elevated rims.

Consistency: rather firm, friable.

Surface: smooth, slightly hispid, crispy.

Colour: whitish transparent at the surface and
fistules, yellowish-brown or purplish in the endo-
some.

Ectosome: a rather dense, subisotropic reticulation
of oxea, easily removed.

Choanosome: basically the skeleton consists of
paucispicular primary lines with many confused
secondary spicules. In places the whole skeleton
is a confused and dense reticulation. Many subder-
mal and choanosomal spaces.

Spongin: very little, confined to the nodes of the
spicules, or absent.

Spicules: stout, straight oxea with long and sharp
points, 150 - 210 by 7.5 - 12.5 μ m.

Habitat. Subtidal to 50m, in places with moderate
water movement.

Distribution. Mediterranean-Atlantic. Common
along the British and Irish coasts.

Haliclona angulata (Bowerbank, 1866)

(Fig. 9; Plate III, Fig. 3; Plate VII, Figs. 1 - 3)

Remark: *H. angulata*, *H. fibulata* and *H. rava*
(cf. below) possess sigmata and toxa as microscler-
es, on the basis of which they are usually incorpor-
ated in other genera. The possession of these
microscleres is here regarded as a primitive charac-
ter, since they do also occur in many non-haplo-
sclerid groups of sponges (cf. also de Weerd,
1985, 1986, and de Weerd & van Soest, 1986).
According to the principles of phylogenetic
systematics a genus may not be defined on the
basis of a primitive character. The genus *Gellius*,
the type-species of which is *H. angulata*, is there-
fore abandoned and synonymized with *Haliclona*.

Halichondria angulata Bowerbank, 1866: 233;
1874: 101, Pl. XLI, Figs. 4 - 8.

Isodictya indefinita Bowerbank, 1866: 286;
1874: 126, pl. XLIX, Figs. 15 - 17.

Isodictya jugosa Bowerbank, 1866: 296; 1874:
128, Pl. L, Figs. 11 - 14.

Isodictya fallax Bowerbank, 1866: 302; 1874:
132, Pl. LI, Figs. 10 - 13.

Halichondria couchii Bowerbank, 1874: 203,
Pl. LXXIII, Figs. 12 - 15.

Gellius angulatus; Lundbeck, 1902: 63, Pl. XII,
Fig. 12 a-d; Arndt, 1935: 91; Ackers *et al.*,
1985: 171, Photograph 88.

Haliclona angulata; Burton, 1948: 279.

Shape: cushion-shaped or irregularly massive with
inconspicuous, not elevated oscula. Frequently
there are several fistular processes originating
from the upper or lateral parts of the sponge.

Consistency: rather firm, somewhat brittle.

Surface: fairly smooth, transparent.

Colour: greyish-pink, pink, white with rosy tinges.
Ectosome: a regular and characteristic, open,
isotropic reticulation of intercrossing oxea.

Choanosome: a rather confused, sub-halichondroid
reticulation, in places consisting of paucispicular
primary and unispicular secondary lines, in places
multispicular tracts.

Spongin: very little, confined to the nodes of the
spicules, or absent.

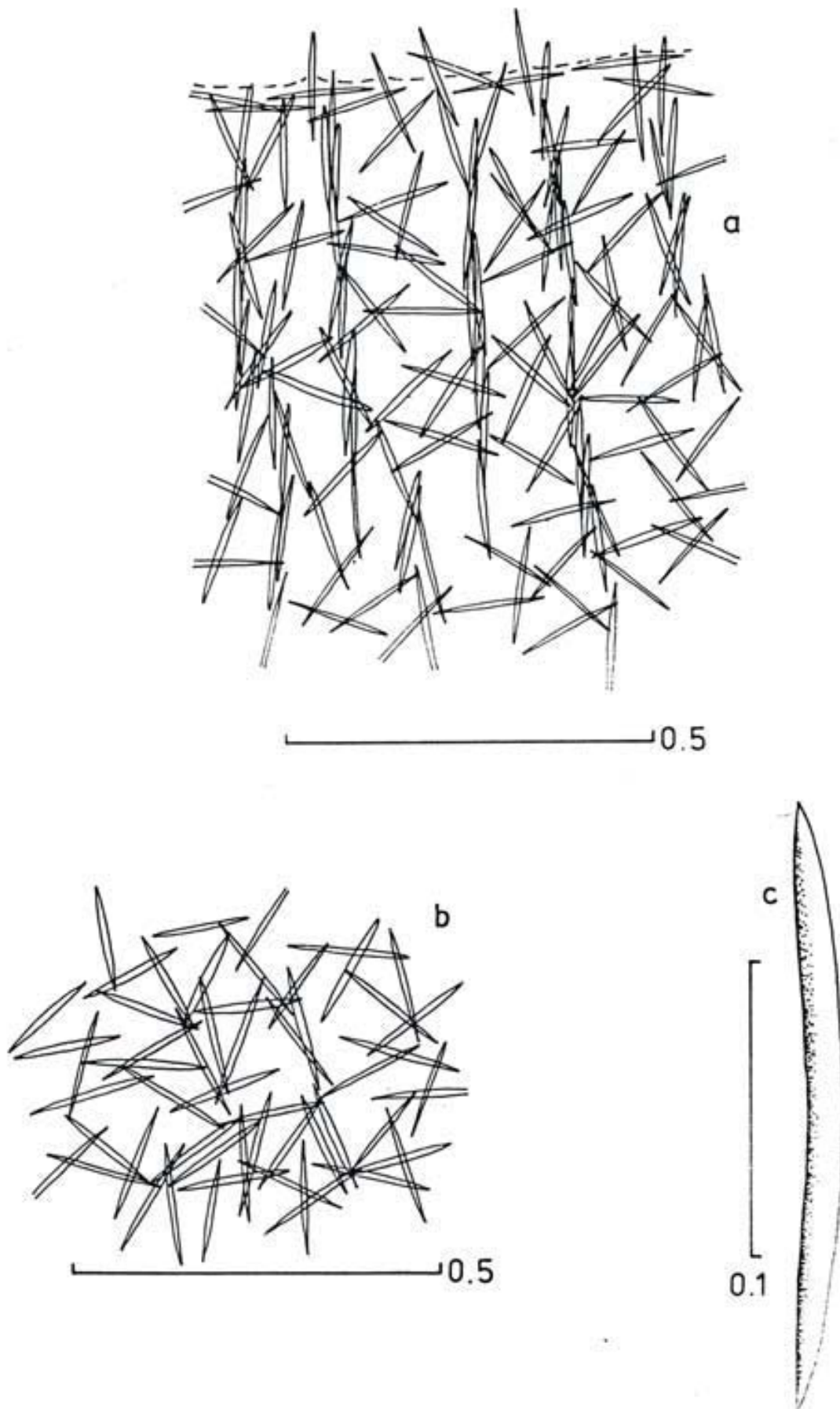


Figure 8. *Haliclona fistulosa*, a: cross-section of choanosomal skeleton, b: tangential view of ectosomal skeleton, c: oxeote (scale in mm).

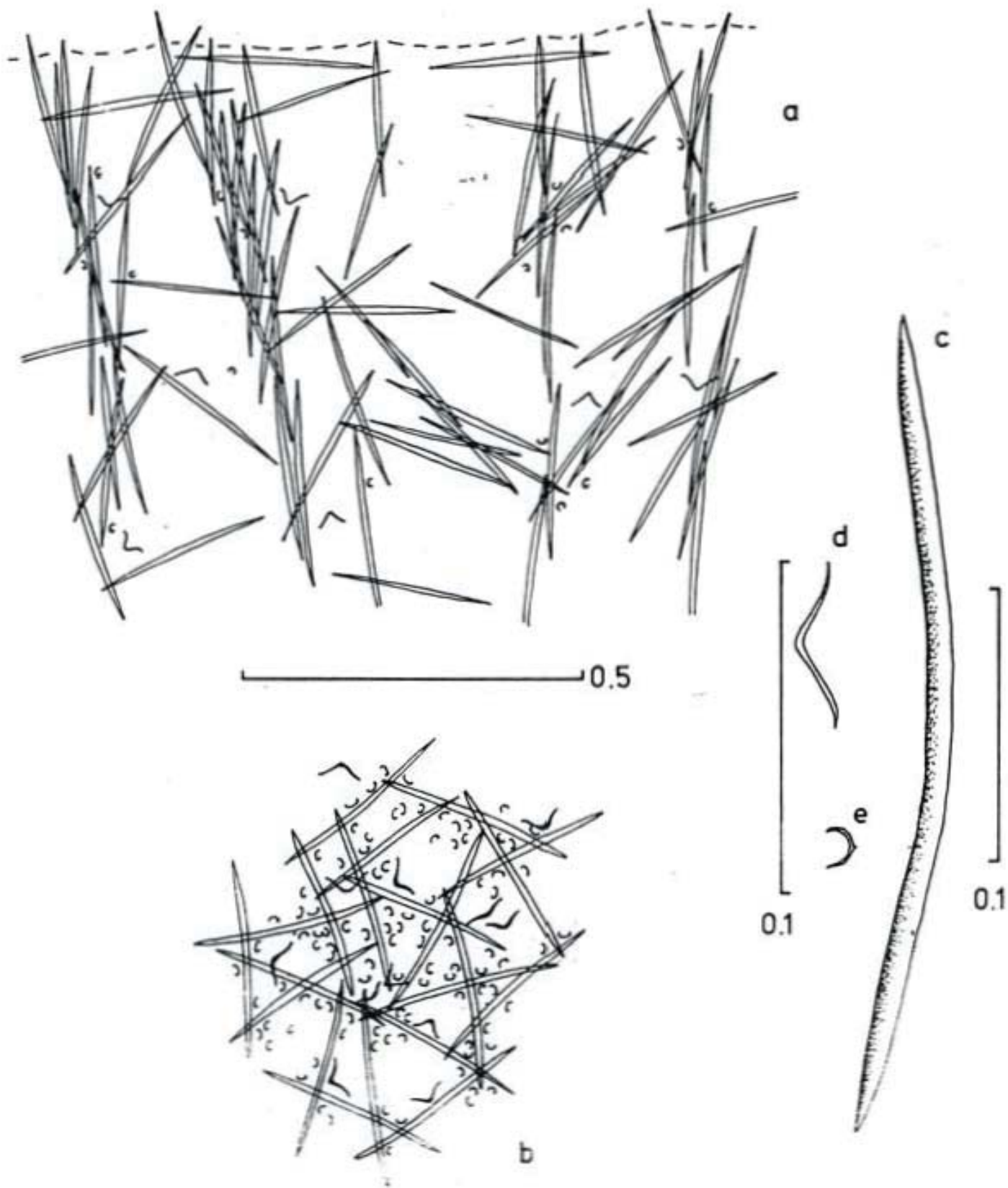


Figure 9. *Haliclona angulata*, a: cross-section of choanosomal skeleton, b: tangential view of ectosomal skeleton, c: oxeote, d: toxon, e: sigma (scale in mm).

Spicules: long, thin oxea with long, rather sharp points, 250 - 400 by 3 - 10 μ m. Sigmata: small, strongly curved, somewhat accolade - shaped, 7.5 - 20 by ca. 0.25 - 13 μ m. Toxa: sharply bent, with recurved apices, 50 - 80 by ca. 0.5 - 25 μ m. The microscleres may be absent.

Habitat. Subtidal to 150m.

Distribution. Arctic-boreal, Mediterranean. Probably rather common along the British and Irish coasts.

Haliclona fibulata (Schmidt, 1862)

(Fig. 10; Plate III, Figs. 1 & 2; Plate VI, Figs. 3 - 5)

Reniera fibulata Schmidt, 1862: 73, Pl. VII, Fig. 9.

Gellius fibulatus: Topsent, 1925: 706, Pl. VIII, Fig. 6; Arndt, 1941: 14.

Shape: Cushion shaped, with a regular outline, occasionally with thin, fistular processes. Few, small, not elevated oscula.

Consistency: moderately soft, fistulae slightly brittle.

Surface: smooth. Characteristic is the strong reticulation of the surface.

Colour: light purplish-pink.

Ectosome: a rather dense, irregular, unispicular, tangential reticulation.

Choanosome: paucispicular primary and unispicular secondary lines, with many spicules in confusion.

Spongin: sparse, at the nodes of the spicules.

Spicules: oxea: rather slender, 120 - 150 by 4.5 - 5.5 μ m. Sigmata: small, irregularly curved, ca. 16.5 - 21.5 by 0.5 - 1.7 μ m. Sigmata sometimes absent.

Habitat. Subtidal, on stones, etc., to ca. 50m.

Distribution. Mediterranean-Atlantic. Probably rather rare along the British and Irish coasts. A large specimen was collected at Ravens Point, Anglesey, by G. Ackers (identified by W.C. Jones) in 1983. A few small specimens were furthermore collected during the sponge workshop in Lough Ine (South Ireland).

Haliclona rava (Stephens, 1912)

(Fig. 11; Plate III, Fig. 6; Plate VI, Fig. 6)

Gellius rava Stephens, 1912: 22, pl. 1, figs. 10-12; 1917: 6.

Shape: small, flat, encrusting patches, not exceeding 4cm in diameter, with a few, small oscules. The oscula have a rather well developed, transpar-

ent rim raising to 1cm above the surface.

Consistency: soft, fragile.

Surface: smooth, even.

Colour: greyish-yellow.

Ectosome: the ectosomal skeleton is a rather irregular, subisotropic reticulation of single spicules which are bound at the nodes by a small amount of spongin.

Choanosome: the choanosomal skeleton is somewhat confused, with irregular paucispicular primary and unispicular secondary lines. Many spicules in confusion.

Spongin: sparse, at the nodes of the reticulation.

Spicules: oxea: slender, with long and sharp points, 170 - 225 x 5 - 9.5 μ m; a few stylote modifications are intermixed. Sigmata: irregularly bent, very small, 4.8 - 12 x ca. 0.5 μ m. Toxa: very slender, with an indistinct and irregular angle, sometimes almost straight, with slightly recurved apices, 38.5 - 120 x ca. 0.5 μ m. The microscleres may be absent.

Habitat: possibly confined to the upper intertidal area, under stones.

Distribution: Possibly Mediterranean-Atlantic. Found only once by the author at Sherkin Island (three specimens). There are no other Irish records of this species, but it is common at Church Island and Rhosneigr, Anglesey, North Wales (Jones, 1984 and pers. comm.; it was recorded as *Gellius angulatus* in that paper, the two specific names having been judged synonymous by Burton, 1948).

Genus *Acervochalina* Ridley, 1884

Acervochalina limbata (Montagu, 1818)

(Fig. 12; Plate III, Fig. 4; Plate VII, Fig. 4)

Spongia limbata Montagu, 1818: III, Pl. XIV, Figs. 2 & 3.

Chalina limbata; Bowerbank, 1866: 373; 1874: 172, Pl. LXVII, Figs. 7 - 13.

Haliclona limbata; Alander, 1942: 24, Pl. 3 Figs. 2 & 3.

Chalina gracilentia Bowerbank, 1866: 372; 1874: 171, Pl. LXVII, Figs. 4 - 6.

Chalina zostericola Topsent, 1892: xviii.

Shape: cushion-shaped with a few, rather large, not elevated oscula.

Consistency: soft, compressible, very spongy.

Surface: strongly hispid.

Colour: brown.

Ectosome: absent.

Choanosome: the skeleton consists of an irregular

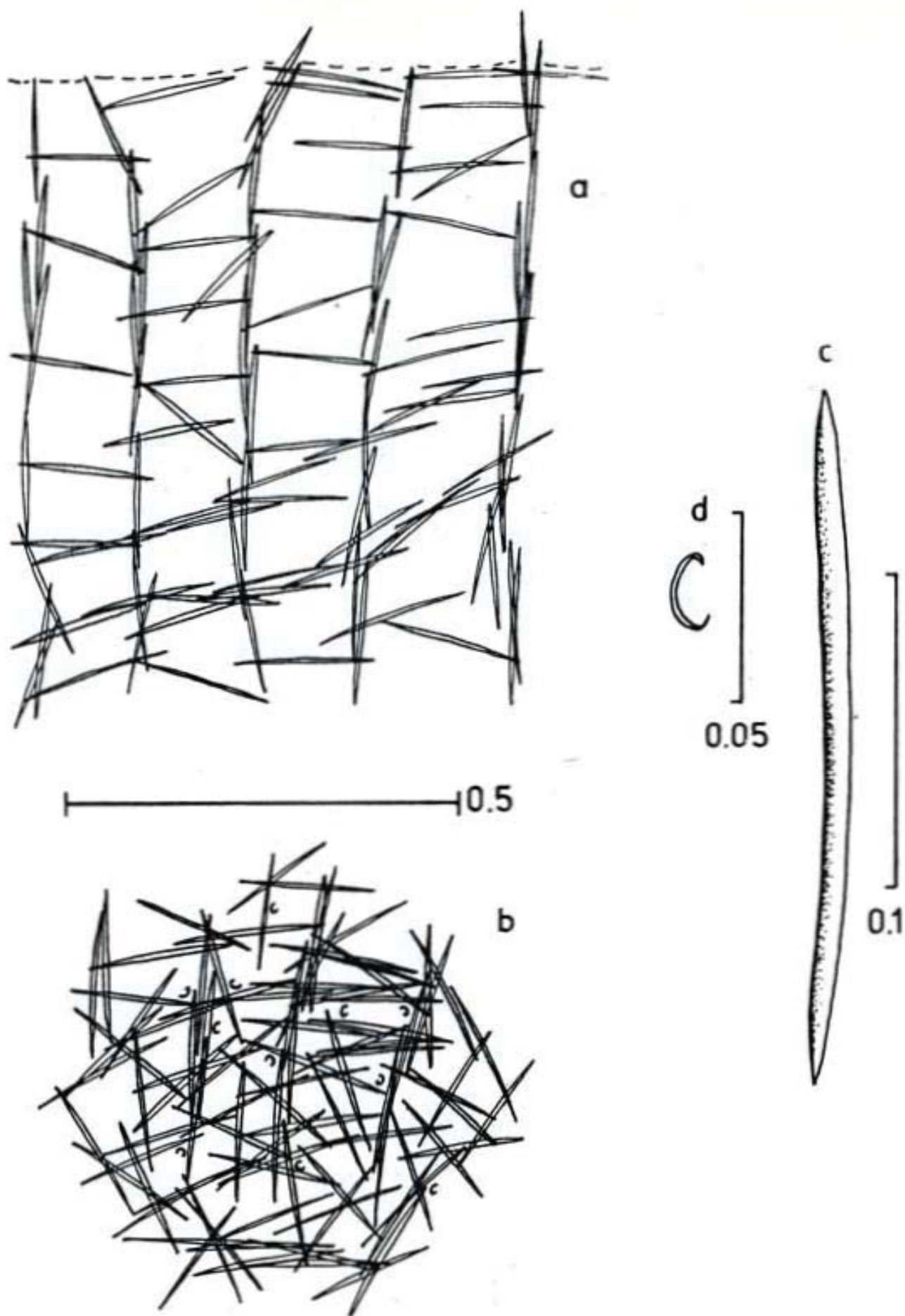


Figure 10. *Haliclona fibulata*, a: cross-section of choanosomal skeleton, b: tangential view of ectosomal skeleton, c: oxeote, d: sigma (scale in mm).

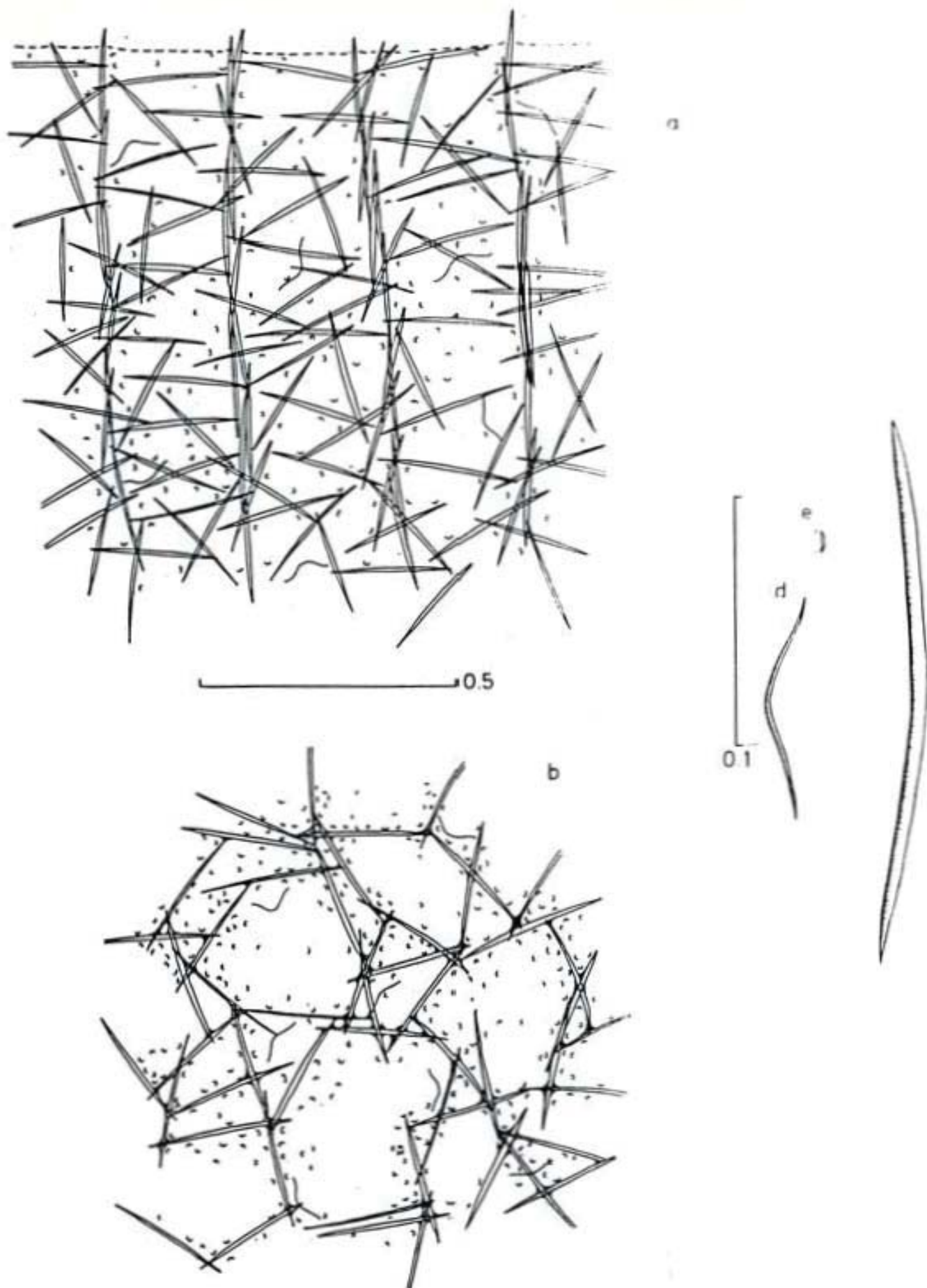


Figure 11. *Haliclona rava*, a: cross-section of choanosomal skeleton, b: tangential view of ectosomal skeleton, c: oxeote, d: toxon, e: sigma (scale in mm).

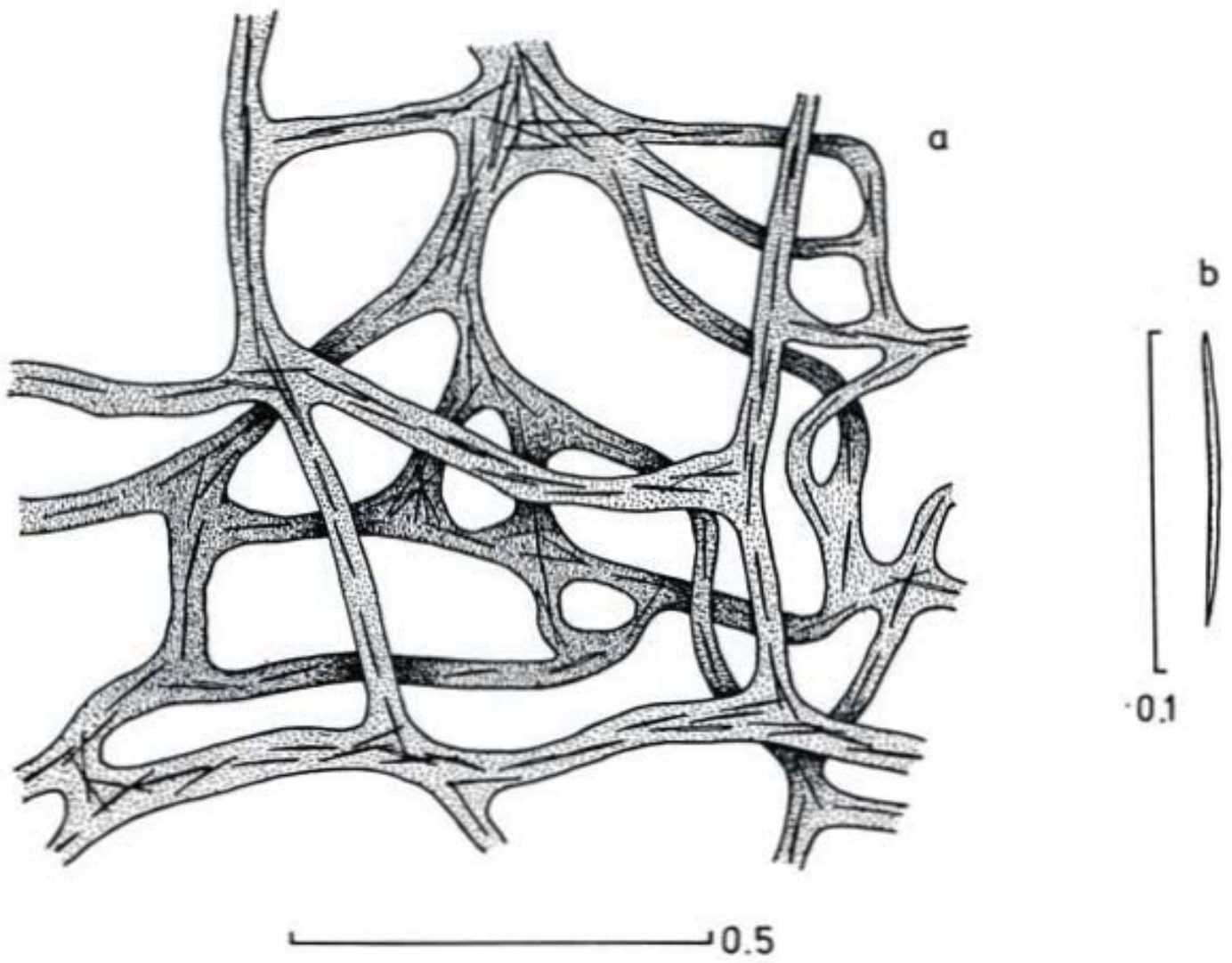


Figure 12. *Acervochalina limbata*, a: cross-section of choanosomal skeleton, b: oxete (scale in mm).

reticulation of spongin fibres of varying thickness, cored by 1 - 5 oxea of reduced size. There is no distinction between primary and secondary fibres.

Spongin: abundant, forming the main part of the skeleton.

Spicules: thin, very small oxea, 50 - 80 by 0.5 - 1.5 μ m.

Habitat. In the intertidal area, growing on *Fucus* etc.

Distribution. Arctic-boreal, Mediterranean. Probably not common along the British and Irish coasts.

Acervochalina loosanoffi (Hartman, 1958)

(Fig. 13; Plate III, Fig. 5; Plate VII, Figs. 5 & 6)

Haliclona loosanoffi Hartman, 1958: 62, Figs. 21 - 25, Pl. 12, Figs. 1 - 4.

Haliclona loosanoffi van Soest, 1976: 177 - 187, Figs. 1 - 3, Pl. 1, Figs. A - F; van Soest & Weinberg, 1980: 8, Fig. 9.

Shape: varying from thinly encrusting to tubular. In the tubular sponges there are generally more tubes arising from a common encrusting base. They coalesce and anastomose in various degrees, and are gradually tapering into small terminal oscula.

Consistency: extremely soft and compressible.

Surface: slightly to strongly hispid, somewhat shaggy.

Colour: light greyish-brown.

Ectosome: absent.

Choanosome: basically the skeleton consists of an irregular reticulation of fibres of spongin with ill-defined primary and secondary lines. Generally the primary lines are cored by more spicules (2 - 5) than the secondary lines (1 - 3). The skeletal structure is rather variable, however, in that it may also consist of more clearly distinguishable primary and secondary lines. In this case the spongin is less prevalent (cf. also Hartman, 1958). It should be remarked here that in European sponges of this species only spongin - reinforced skeletons were found.

Spongin: generally very pronounced, forming the main part of the skeleton.

Spicules: oxea of variable size and form, generally 70 - 120 by 2 - 4.5 μ m.

Conspicuous is the high number of malformed spicules: thin, centrotylote oxea are the most common abnormalities, but also short, thick centrotylote strongyles, or even two spicules

joined by a common thickening, occur quite frequently.

Gemmules. Functional gemmules are formed during the late summer and early autumn. They are characteristic for the species, size 300 - 400 μ m.

Habitat. Intertidal and subtidal, probably to ca. 15m. Often growing on shells of mussels and oysters, on wharf piles, under pontoons etc., also in brackish water and estuarine environments.

Distribution. New England (U.S.A.), the Oosterschelde (S.W. - part of the Netherlands). One specimen found in the Rapids of Lough Ine (Ireland) (van Soest & Weinberg, 1980).

Remarks. Most probably *Acervochalina loosanoffi* has recently been introduced by the import of American oysters in the Netherlands, from where it is now slowly dispersing. Remarkable is the fact that every year only a few sponges are found in the Oosterschelde, but always in exactly the same areas. Besides the gemmules, which are responsible for these local stable but small populations, larvae are produced in September and October. This is rather late compared with the time of reproduction as observed by Fell in American populations of *A. loosanoffi* (Fell, 1974, 1976a, b, 1978, Fell *et al.*, 1979). Possibly this late sexual reproduction is a limiting factor for successful dispersal.

KEY TO THE SPECIES

To identify a species it is necessary to make two microscopical preparations: one of the ectosome and one of the choanosome. The presence of an ectosomal skeleton is not always readily established and it is therefore recommended to start as follows:- Make a square of ca. 1 x 1 cm with a sharp razor blade at the surface of the sponge (when the surface does not allow such an incision, e.g. by tearing, there will probably be no ectosomal skeleton). Insert a corner of the razor blade just beneath the incision and start to remove the ectosome of the square by a gentle rotating (sawing) movement with the razor blade. It is important to do this without force. When the whole square is loosened it may be removed with a fine pair of tweezers and put on a microscopical slide. For a preparation of the choanosome it is best to rest the sponge on a piece of cork. With one finger, or another piece of cork resting on the sponge, two or more thin vertical sections are cut, the best of which may be used for the preparation. A simple and quick way to make a permanent slide when the sponge is fresh is to put a few drops of alcohol on the slide with the piece of sponge, to dry it on a stove and to add

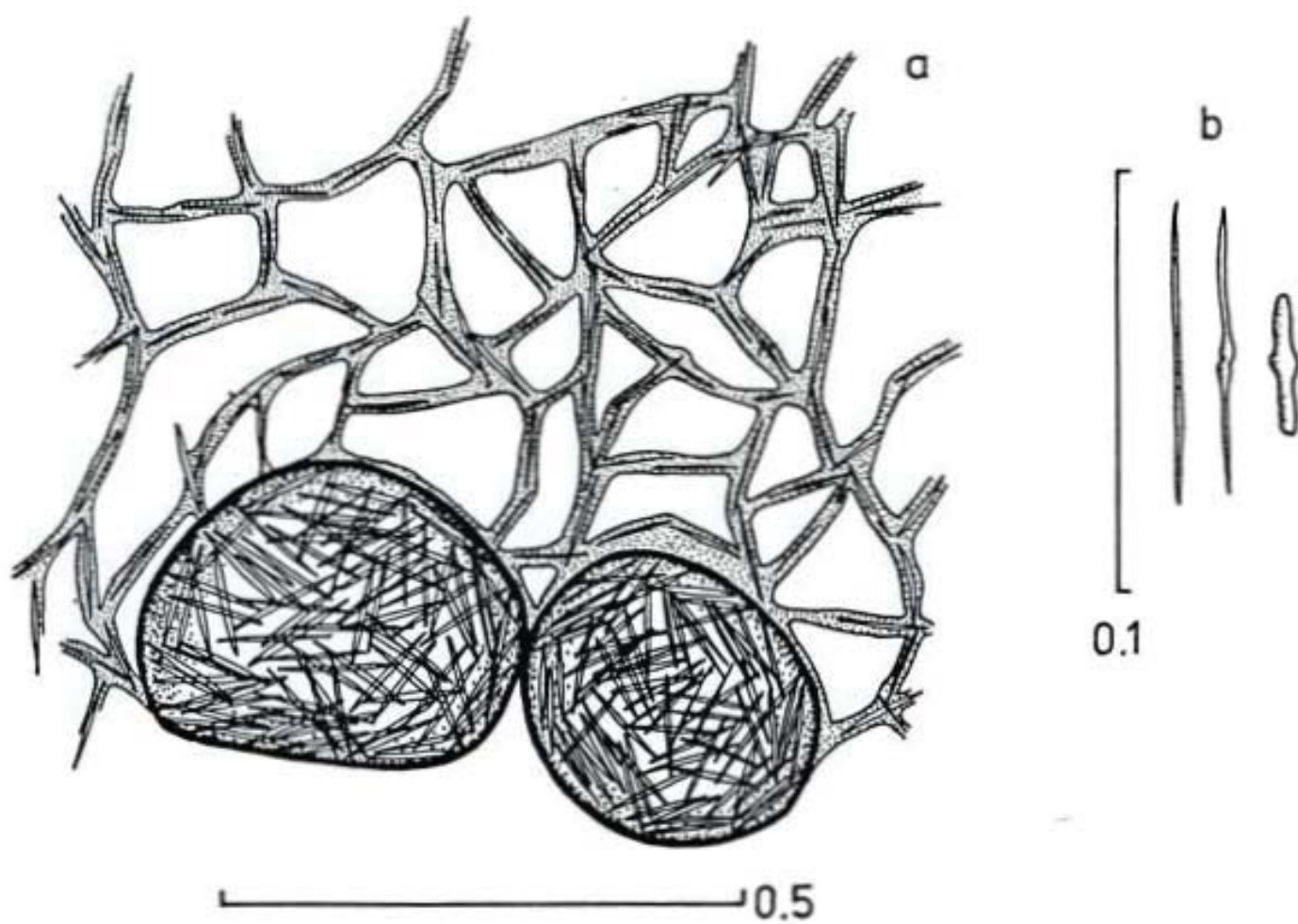


Figure 13. *Acervochalina loosanoffi*, a: cross-section of choanosomal skeleton, b: oxea (scale in mm).

a little Canada-balsam. When the sponge is preserved in spirit it needs only the drying and Canada-balsam. This treatment also reduces loss of microscleres.

For detailed information about making microscopical preparations one is referred to Ackers *et al.*, 1985, p. 36.

In the following key two ways may be followed to identify species which usually do, but not always, have microscleres. It is also possible that they are so scarce that they may be overlooked. It is therefore recommended to go through the entire key before making a definite identification. When a sponge cannot be identified at all, or in case of serious doubt, the material may be sent to the author.

- 1a. Sponge stalked 2
 b. Sponge not stalked 3
- 2a. Branched; branches solid, laterally compressed, with oscules mainly on the narrower sides of the branches, never terminal. Sponge rather soft, smooth, velvety, light-brown, dark-yellow, sometimes with greenish tinges. No ectosomal skeleton. Choanosomal skeleton with uni-paucispicular primary and unispicular secondary lines. Oxea short, 80 - 120 by 4 - 8 μm , often with stylote and strongylote modifications. Fair amount of spongin *Haliclona oculata*.
- b. Cylindrical or slightly compressed tubes growing from a common basal stalk, with terminal oscula. Very soft, sometimes slightly velvety. Young, small sponges not or only slightly collapsing when removed from the water; older sponges may be very limp and shaggy, immediately collapsing when removed from the water. No ectosomal skeleton. Choanosomal skeleton consisting of uni-paucispicular primary lines and unispicular secondaries. In older sponges the skeleton becomes wide-meshed and isotropic, and is often reinforced by longitudinal multispicular tracts. Spongin moderate to abundant, especially at the inner and basal parts of the sponge. Oxea stout, cigar-shaped, varying from 100 - 185 by 4.5 - 8.5 μm (southern specimens) to 180 - 240 by 8.5 - 15.5 μm (northern specimens)..... *Haliclona urceolus*.
- 3a. Microscleres present 4
 b. Microscleres absent 6

- 4a. Cushion-shaped or laterally spreading, sometimes with fistular processes. Surface strongly reticulate. Oscula few, flush with the surface. Light purplish-pink, rather firm, not friable. Ectosomal skeleton an irregular tangential reticulation. Choanosomal skeleton consisting of paucispicular primary and unispicular secondary lines, somewhat confused. Spongin scarce, confined to the nodes of the spicules. Oxea slender, slightly curved, 120 - 150 by 4.5 - 5.5 μm . Sigmata small, irregularly curved, mainly in ectosome, not abundant, sometimes absent, 16.5 - 21.5 by 0.5 - 1.7 μm *Haliclona fibulata*
- b. Sponge thinly encrusting, cushion-shaped or massive, but without a strongly reticulate surface 5
- 5a. Thinly encrusting, with very few, small oscula with a pronounced rim. Colour greyish-brown. Rather soft. Ectosomal skeleton an irregular, unispicular tangential reticulation. Choanosomal skeleton consisting of paucispicular primary and unispicular secondary lines, rather confused. Spongin scarce, confined to the nodes of the spicules. Oxea slender, 170 - 225 x 5 - 9.5 μm . Sigmata irregularly curved, very small, 4.8 - 12 by ca. 0.5 μm . Toxa very slender, with an indistinct and irregular angle, with slightly recurved apices, 38.5 - 120 by ca. 0.5 μm . Microscleres may be absent *Haliclona rava*
- b. Irregularly massive, sometimes with fistular processes. Brittle, fragile. Oscula inconspicuous. Surface smooth, transparent. Greyish pink or white with rosy tinges. Ectosome a regular isotropic reticulation of intercrossing oxea. Choanosome rather confused, sub-halichondroid, in places with paucispicular primary and unispicular secondary lines. Spongin very scarce or absent. Oxea long, 250 - 400 by 3 - 10 μm . Sigmata strongly curved, somewhat accolade-shaped, 7.5 - 20 by 0.25 - 1.2 μm . Toxa sharply bent, with recurved apices, 50 - 80 by ca. 0.5 - 2.5 μm . Microscleres sometimes absent *Haliclona angulata*
- 6a. Ectosomal skeleton present 7
 b. Ectosomal skeleton absent 12
- 7a. Encrusting or repent ramose, firm, corky, in-

- compressible, with nodules near oscules, oscules small, not or only slightly elevated, at regular distances. Different coloured areas of brown, yellow, greyish-white, with sharp margins. Surface smooth, in places slightly hispid. Ectosomal skeleton regular, unispicular, isotropic. Choanosomal skeleton a strong reticulation of paucispicular primary and unispicular secondary lines. Many subdermal and choanosomal spaces. Spongin moderate to abundant, Oxea short, thick, 130 - 155 by 8 - 11 μ m *Haliclona simulans*
- b. Sponge encrusting, massive or otherwise, but softer, not corky 8
- 8a. Thinly encrusting, thickly encrusting with volcano-shaped oscular elevations, thickly encrusting with irregularly inosculating branches, or inosculating branches without an encrusting base. Very soft, compressible, fragile, with slime-strands when the sponge breaks or when the ectosome is removed. Brown, pink, lavender. Ectosome a very regular, unispicular, isotropic reticulation. Spongin variable, but always clearly present at the nodes of the spicule lattice. Oxea short, with short points, 80 - 120 by 4 - 8 μ m, often with strongylote and stylote modifications *Haliclona cinerea*
- b. Sponge thinly encrusting, cushion-shaped or massive, but not consisting of inosculating branches. No slime-strands, spongin confined to the nodes of the spicules or absent 9
- 9a. Sponge cushion-shaped or laterally spreading with a few oscula flush with the surface. Some fistular processes may be present. Surface strongly reticulate. Colour light purplish-pink. Moderately soft. Ectosomal skeleton an irregular tangential reticulation. Choanosomal skeleton consisting of paucispicular primary and unispicular secondary lines, somewhat confused. Spongin confined to the nodes of the spicules. Oxea slender, 120 - 150 by 4.5 - 5.5 μ m *Haliclona fibulata*
- b. Sponge thinly encrusting, cushion-shaped or massive, but without a strongly reticulate surface 10
- 10a. Sponge thinly encrusting, with very few, small oscula with a pronounced rim. Colour greyish-brown. Rather soft. Ectosomal skeleton an irregular, unispicular tangential reticulation. Choanosome consisting of paucispicular primary and unispicular secondary lines, rather confused. Spongin confined to the nodes of the spicules. Oxea slender, 130 - 165 x 4.8 - 8.4 μ m *Haliclona rava*
- b. Sponge cushion-shaped or massive, brittle, with a transparent ectosome, oxea robust, straight. No or very scarce spongin 11
- 11a. Sponge massive, with hollow fistulae and a few, large oscula with slightly elevated rims. Rather firm, friable in the endosome, brittle in the ectosome. Ectosomal skin easily peeled off. Whitish transparent at the surface, dark yellow-brown or purplish in the endosome. Ectosomal skeleton a rather dense, subisotropic reticulation. Choanosome a rather dense reticulation of paucispicular primary and unispicular secondary lines, in places confused, subisotropic. Many subdermal and choanosomal spaces. Spongin absent or very sparse. Oxea stout, straight, with long and sharp points, 150 - 210 by 7.5 - 12.5 μ m *Haliclona fistulosa*
- b. Irregularly massive, sometimes with fistular processes. Brittle, fragile. Oscula inconspicuous. Surface smooth, transparent. Greyish-pink or white with rosy tinges. Ectosome a regular isotropic reticulation of intercrossing oxea. Choanosome rather confused, sub-halichondroid, in places with paucispicular primary and unispicular secondary lines. Spongin very scarce or absent. Oxea long, straight, with long and sharp points, 250 - 400 by 3 - 10 μ m *Haliclona angulata*
- 12a. Choanosomal skeleton consisting of clearly distinguishable primary and secondary lines 13
- b. No clear distinction between primary and secondary lines 15
- 13a. Massive encrustations with closely packed oscula in rows on shared or unshared volcano or chimney-shaped elevations. Surface irregular with ridges and punctate elevations. Firm, friable, very slimy, greyish purple, in places yellowish. Choanosome a close-meshed reticulation of pauci-multispicular primary and unispicular secondary lines. Many spicules in confusion. Very

- little spongin. Oxea slender, fusiform, 110 - 150 by 3 - 7.5 μ m *Haliclona viscosa*
- b. Oscules not close-packed and in rows, sponge softer, not very slimy 14
- 14a. Thick encrustations with rather large, slightly elevated, irregularly scattered oscula. Soft, fragile, friable, somewhat slimy. Subdermal exhalant canals radiating to the oscula. Surface punctuate. Greenish-brown. Choanosomal skeleton a close-meshed reticulation of pauci-multispicular primary and unispicular secondary lines. Many spicules in confusion. Very little spongin. Oxea slender, fusiform, 110 - 150 by 3 - 7.5 μ m *Haliclona indistincta*
- b. Thinly encrusting or irregularly cushion-shaped, sometimes with irregular fistular processes. Oscula slightly elevated, randomly scattered. Soft, smooth, fragile. Rose-pink, sometimes light-brown. Choanosomal skeleton consisting of paucispicular primary and unispicular secondary lines. Very little spongin. Oxea with long points, 120 - 180 by 6 - 10 μ m *Haliclona rosea*
- 15a. Cushion-shaped, very spongy, compressible, with few, rather large, not elevated oscules. Strongly hispid. Brown. Choanosomal skeleton an irregular reticulation of fibres of spongin cored by 1 - 5 small oxea. No distinction between primary and secondary lines. Oxea 50 - 80 by 0.5 - 1.5 μ m *Acervochalina limbata*
- b. Extremely soft and compressible, encrusting or tubular sponge. Tubes sometimes coalescent, growing from an encrusting base, gradually tapering to small terminal oscula. Slightly to strongly hispid, somewhat shaggy. Light greyish-brown. Skeleton an irregular reticulation of fibres of spongin cored by 1 - 5 small oxea 70 - 120 by 2 - 4.5 μ m. Many malformed spicules (centrotylote oxea or strongyles, etc.) intermixed. Functional gemmules in the basal parts of the sponge, 400 - 400 μ m *Acervochalina loosanoffi*

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LEGENDS TO PLATES I - II

Plate I

1. *Haliclona oculata* (Pallas, 1766), ZMA POR. 4718
2. *Haliclona urceolus* (Rathke & Vahl, 1806), ZMA POR. 5515
3. *Haliclona urceolus* (Rathke & Vahl, 1806), ZMA POR. 5526
4. *Haliclona cinerea* (Grant, 1826), a: delicate growth form of thin, inosculating proliferations, partly encrusting a seaweed, b: sprawling, thickly encrusting mass of inosculating branches and osculiferous elevations, c: laterally spreading encrustation with slightly elevated oscules (ZMA POR. 5525), d: encrusting mound with oscular chimneys.

Plate II

1. *Haliclona simulans* (Johnston, 1842), a: thinly encrusting, different coloured areas are visible (ZMA POR. 5524), b: thinly encrusting. c: branching growth form (ZMA POR. 5516).
2. *Haliclona viscosa* (Topsent, 1888), ZMA POR. 4379.
3. *Haliclona indistincta* (Bowerbank, 1866), ZMA POR. 5517.
4. *Haliclona rosea* (Bowerbank, 1866), a: thinly encrusting with slightly elevated oscule (ZMA POR. 5518), b: irregularly cushion-shaped with fistular processes and large, elevated oscules, specimen of Zoologisk Museum, Kobenhavn.

PLATE I

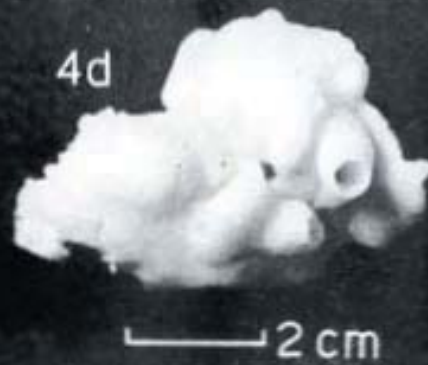
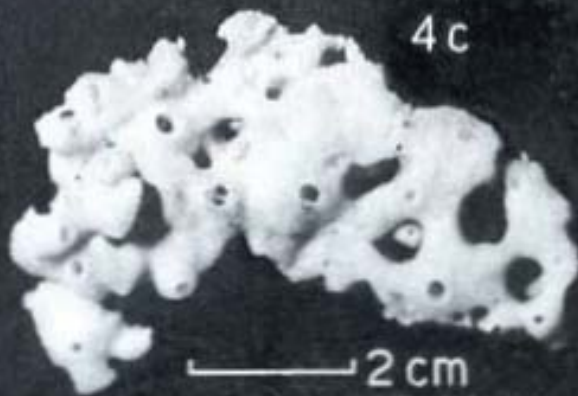
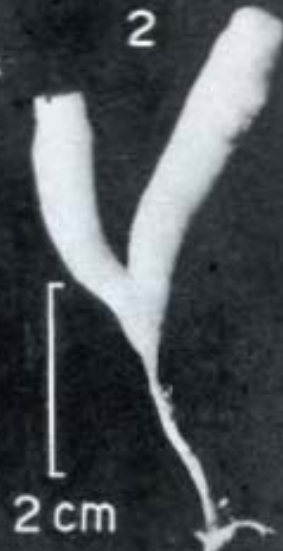
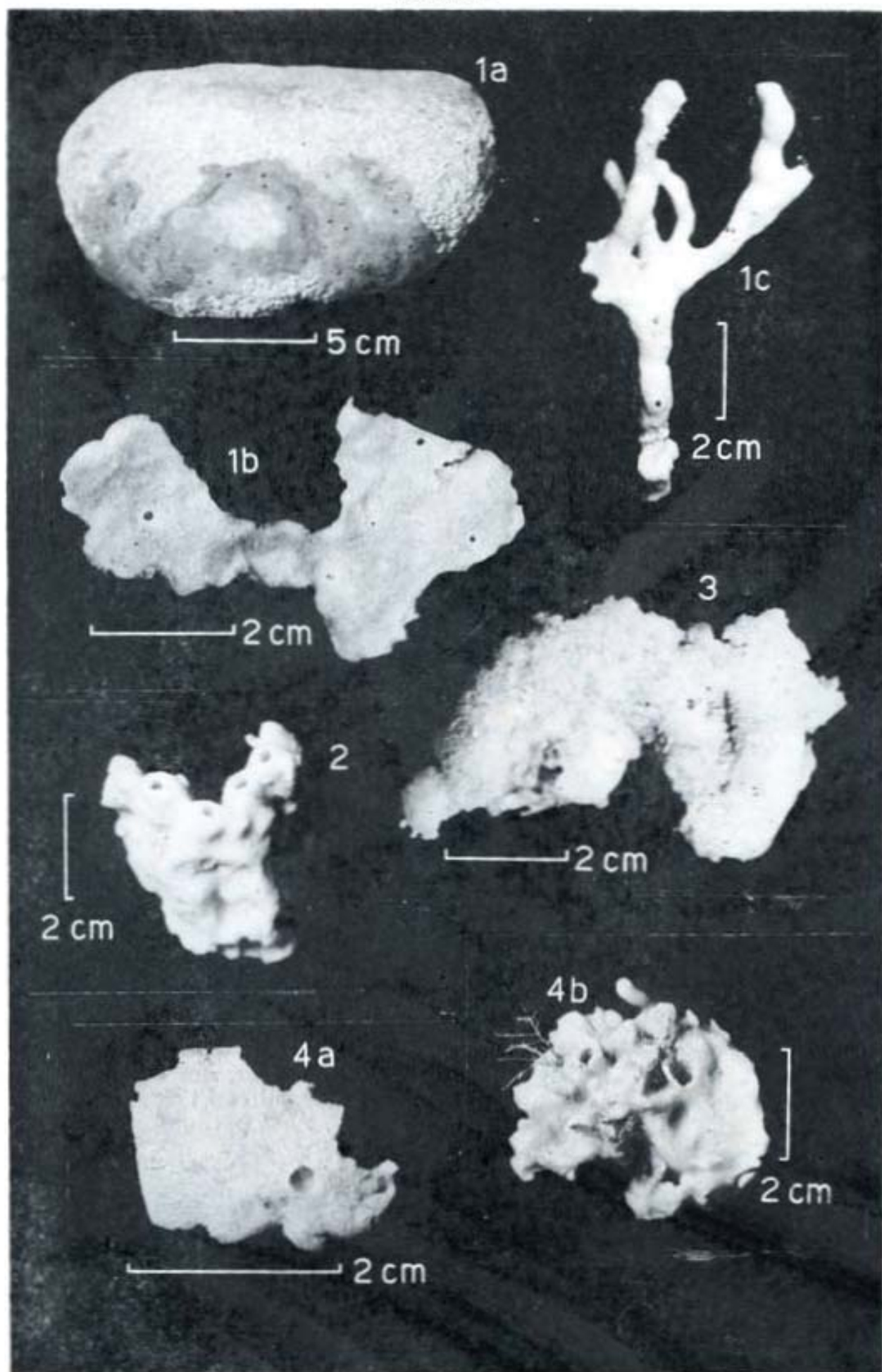


PLATE II



LEGENDS TO PLATES III VII

Plate III

1. *Haliclona fistulosa* (Bowerbank, 1866), a cushion-shaped specimen, b: cushion-shaped with fistular processes, ZMA POR. 5519.
2. *Haliclona fibulata* (Schmidt, 1862), ZMA POR. 5520.
3. *Haliclona angulata* (Bowerbank, 1866), ZMA POR. 2472.
4. *Acervochalina limbata* (Montagu, 1818), ZMA POR. 4316.
5. *Acervochalina loosanoffi* (Hartman, 1958), ZMA POR. 3552.
6. *Haliclona rara* (Stephens, 1912), ZMA POR. 5674.

Plate IV

1. *Haliclona oculata*, cross-section of choanosome.
2. *Haliclona urceolus*, cross-section of choanosome of young specimen.
3. *Haliclona urceolus*, longitudinal section of choanosome of older specimen.
4. *Haliclona urceolus*, detail of choanosomal skeleton.
5. *Haliclona cinerea*, ectosome.
6. *Haliclona cinerea*, cross-section of choanosome of (the vague granular tracts are slime-strands (see text)).

Plate V

1. *Haliclona simulans*, ectosome.
2. *Haliclona simulans*, cross-section of choanosome.
3. *Haliclona simulans*, detail of choanosome.
4. *Haliclona viscosa*, cross-section of choanosome.
5. *Haliclona indistincta*, cross-section of choanosome.
6. *Haliclona rosea*, cross-section of choanosome.

Plate VI

1. *Haliclona fistulosa*, ectosome.
2. *Haliclona fistulosa*, cross-section of choanosome.
3. *Haliclona fibulata*, ectosome.
4. *Haliclona fibulata*, cross-section of choanosome.
5. *Haliclona fibulata*, sigma.
6. *Haliclona rara*, sigmata and toxon.

Plate VII

1. *Haliclona angulata*, ectosome.
2. *Haliclona angulata*, cross-section of choanosome.
3. *Haliclona angulata*, sigmata and toxa.
4. *Acervochalina limbata*, cross-section of choanosome.
5. *Acervochalina loosanoffi*, cross-section of choanosome.
6. *Acervochalina loosanoffi*, gemmules.

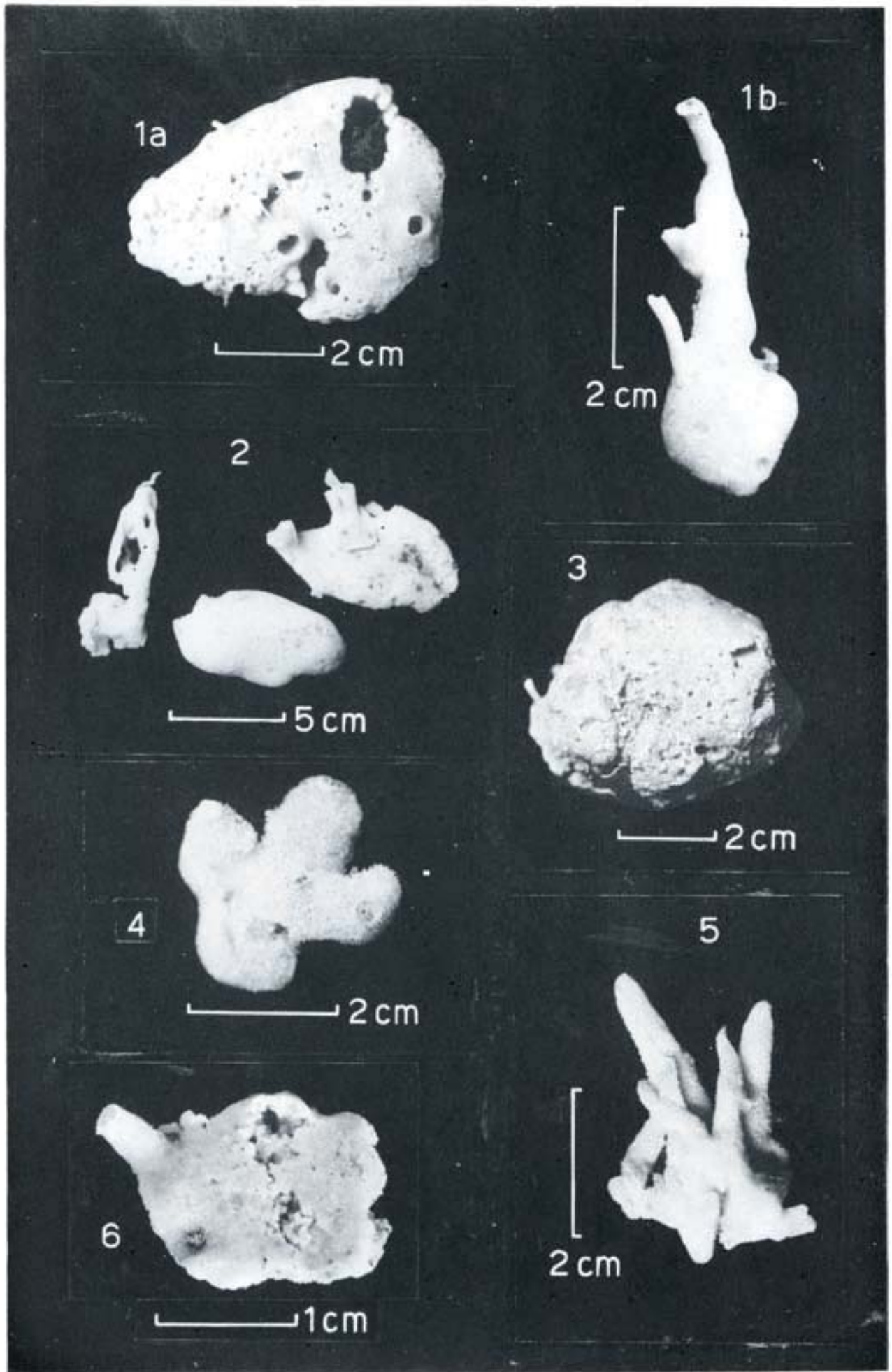


PLATE IV

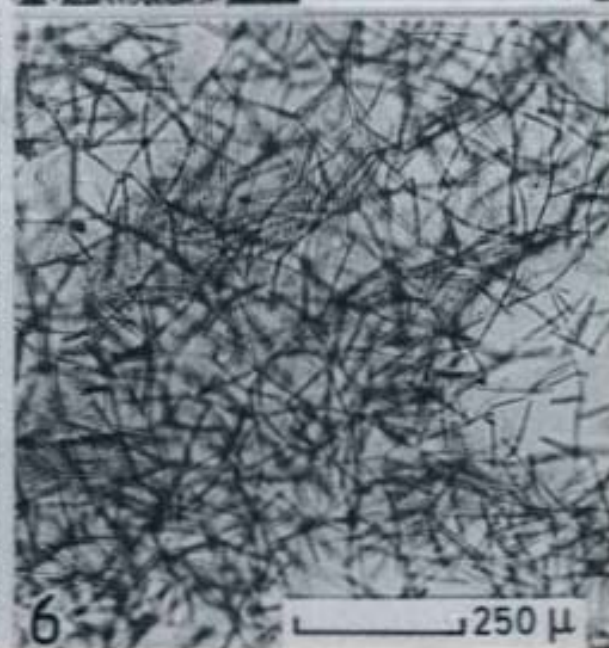
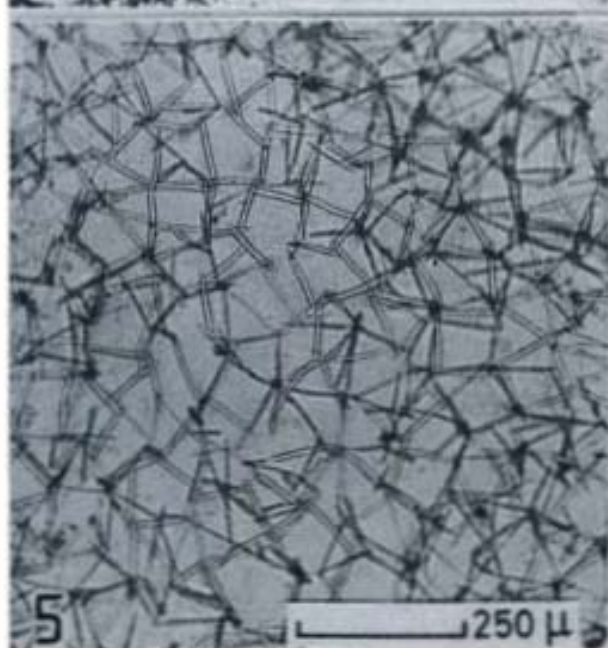
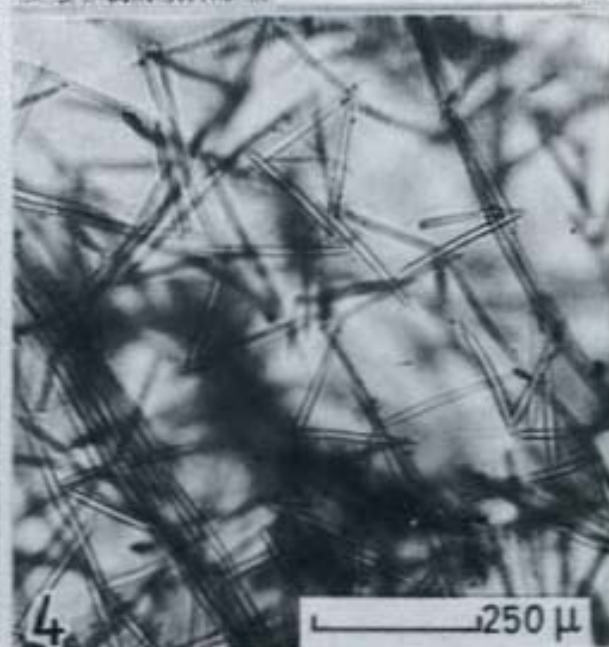
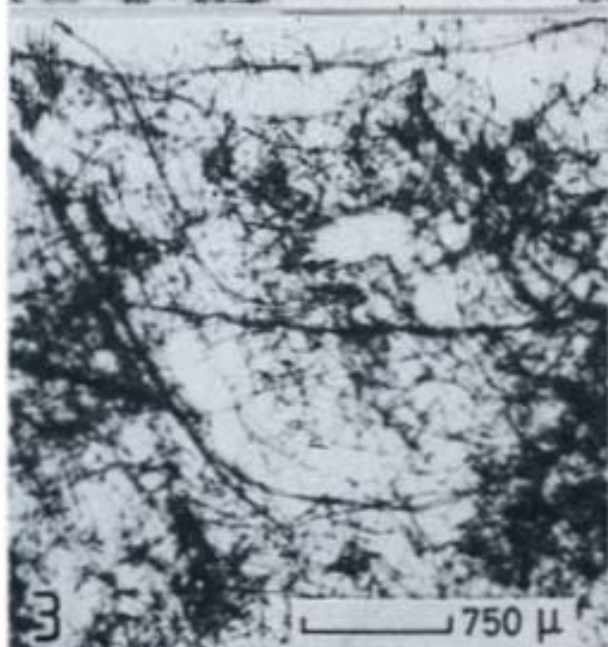
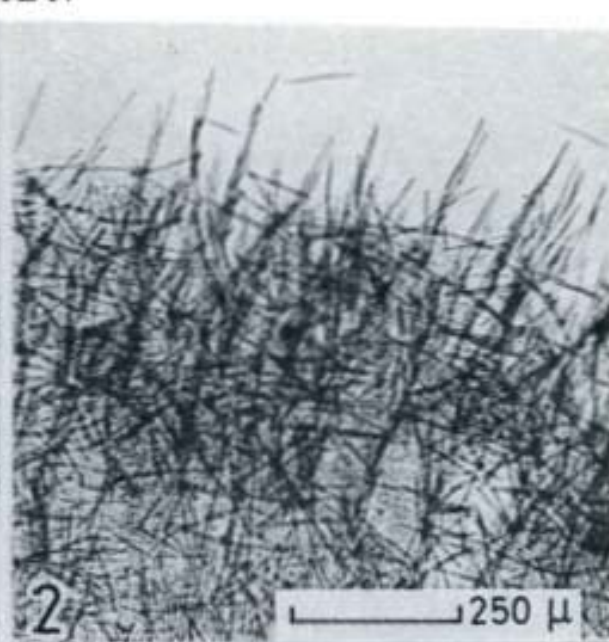
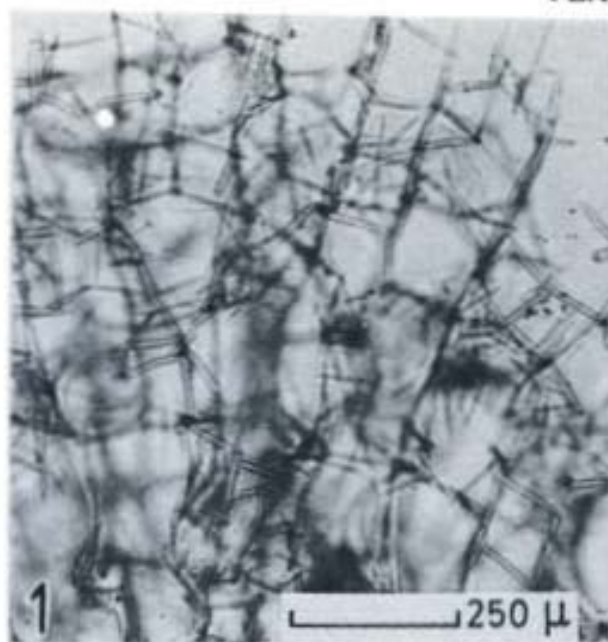


PLATE V

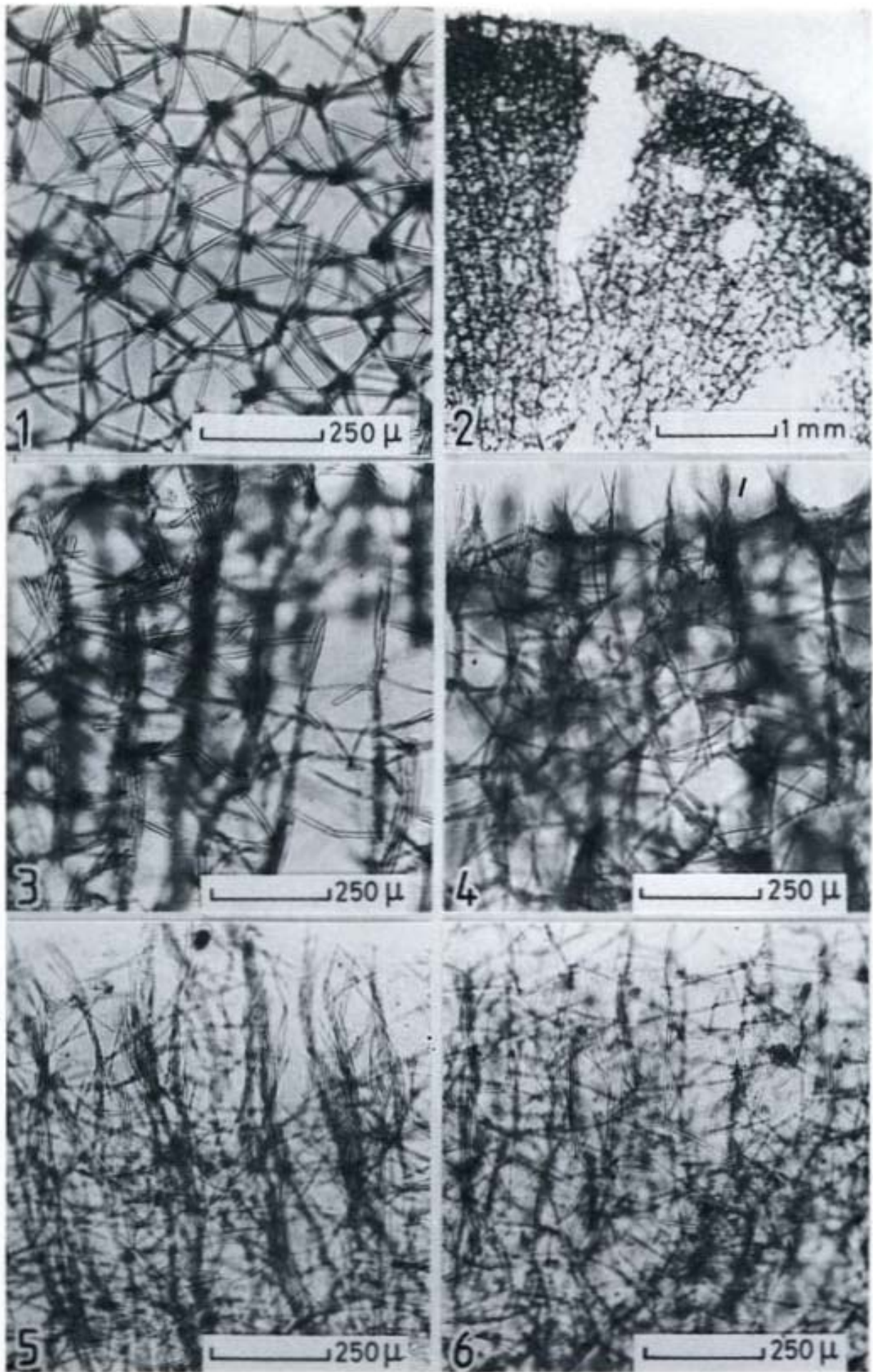


PLATE VI

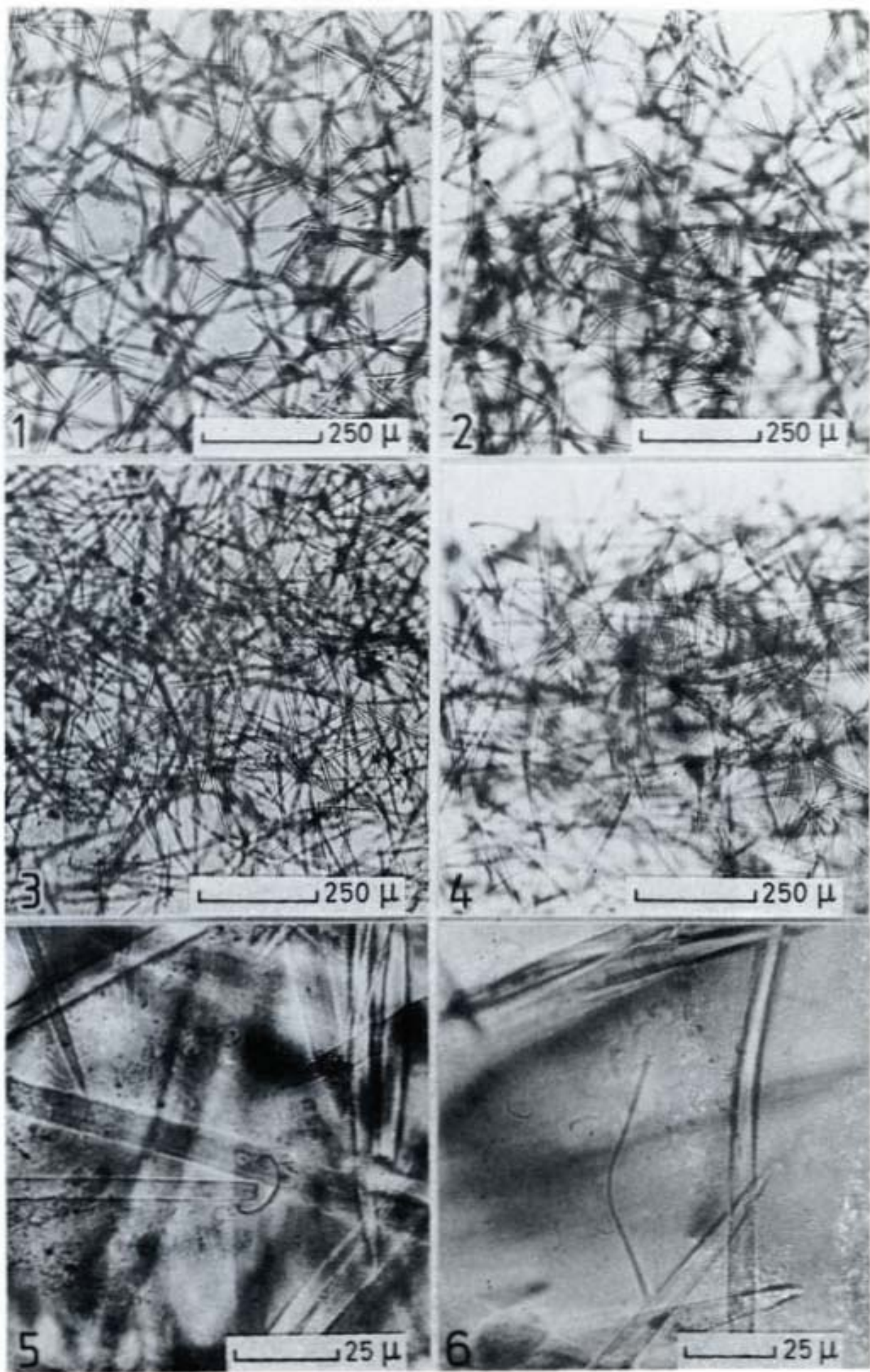
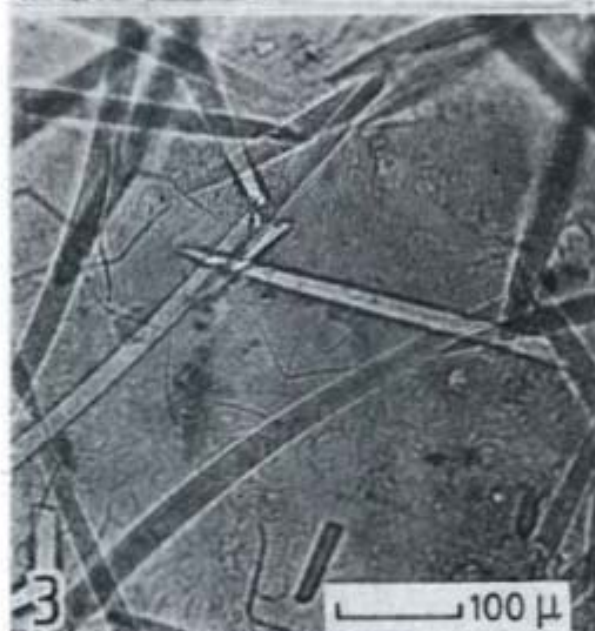
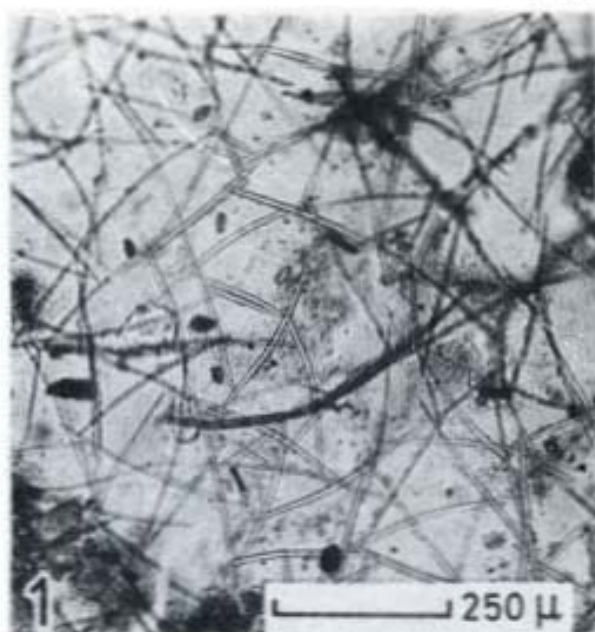


PLATE VII



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