Shallow-Water Demosponges of Western Japan, I

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ABSTRACT

A systematic study of shallow-water demosponges of Western Japan treats 205 species and subspecies, of which 60 species and subspecies are new to science. Three new genera, *Oxylatrunculia, Geodistrongyla* and *Siliquariaspongia*, are proposed, and two species replaced with new names, namely *Dendoryx mollis* Lindgren with *Myxilla hiradoensis* new name and *Homaxinella erecta* Tanita with *Homaxinella tanitai* new name. Further, the keys to the genera treated are given in each order, and the faunistic and zoogeographical reviews are noted.

CONTENTS

I. INTRODUCTION

This paper deals with demosponges from the coastal area of Western Japan. The writer collected the specimens used in this study from various regions of Western Japan since 1969. With the exception of several sponges from the Ariake Sea, the writer has not previously reported on these specimens. The term "Western Japan", as used in this study, includes the western area from Noto Peninsula along the coast of the Sea of Japan, the western area from Kii Peninsula along the Pacific coast and the South West Islands. The majority of the materials were collected from the central part of the Inland Sea of Japan, Inoyada, Uwa-Sea and the Ariake Sea.

Based upon these specimens, taxonomic descriptions have been made. For species already known from the literature, synonymies and distributions are indicated.

In Japan, taxonomic studies of demosponges are lacking, especially on demo-

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sponges from the intertidal to shallow subtidal zone. During the course of this work, an excellent study on shallow water demosponges was published by Wiedenmayer (1977), and from his work the writer obtained much pertinent material. The general work "Sponges" by Bergquist (1978) aroused the writer's interest in the taxonomy of demosponges. Further, "Sponge fauna of Dry Tortugas" by De Laubenfels (1936) was always at the writer's side thoughout this study.

In the face of the many excellent works of various wellknown and well respected sponge taxonomists, the writer often felt frustrated and always humble; nevertheless, the writer found inspiration in these works, and they constituted the motive force behind his efforts. Although this work is possibly filled with contradictions and errors, the writer hopes that his study will form the basis for further taxonomic work on the demosponges of Japan.

II. ACKNOWLEDGEMENTS

The writer wishes to express his gratitude to Prof. Akihiko Inaba, Director of the Mukaishima Marine Biological Station, Faculty of Science, Hiroshima University, for his instruction in many aspects and his encouragement throughout this study. He is also grateful to Dr. Senji Tanita for his interest in this work and his encouragement. The writer is especially grateful to Prof. Reiichiro Hirota and Dr. T. Yamaguchi of the Aitsu Marine Biological Station, Kumamoto University, for their kind aids in collecting the materials from the Ariake Sea. Further, the writer is indebted to the following people for their assistance in collecting materials or for their offers of materials: Dr. H. Katayama of the Mukaishima Marine Biological Station, Prof. T. Kikuchi of the Amakusa Marine Biological Laboratory, Kyushu University, Dr. S. Enomoto of the Iwaya Marine Biological Station, Kobe University, Prof. Ko Yatsuzuka of the Usa Marine Biological Station (since renamed), Kochi University, and graduate students of the Mukaishima Marine Biological Station.

III. PREVIOUS WORKS ON DEMOSPONGES OF WESTERN JAPAN

The earliest report of demosponges from Western Japan is that of Polejaeff (1884) who described *Cacospongia collectrix* (Schluze, 1879) from Kobe. Subsequently, Sollas (1886) described *Myriastra subtilis* Sollas, 1886 from Kobe, and Ridley and Dendy (1887) described *Myxilla rosacea* var. *japonica* Ridley et Dendy, 1887 from Kobe. Lindgren (1897) described the following three species from Hirado Strait of Nagasaki Prefecture: *Gellius strongylatus* Lindgren, 1897, *Dendoryx mollis* Lindgren, 1897 and *Dendoryx rosacea* var. *japonica* (Ridley et Dendy, 1887). Further, Thiele (1898) described the following species from Amami-Oshima or Kagoshima or Tango: *Amorphilla adhaerens* Thiele, 1898, *Leucophloeus* (?) sp. Thiele, 1898, *Spirastrella panis* var. *amamensis* Thiele, 1898, *Stelletta naseana* Thiele, 1898, *Geodia exigna* Thiele, 1898 (from Amami-Oshima), *Suberites sericeus* Thiele, 1898, *Erylus placenta* Thiele, 1898 (from Kagoshima), *Craniella globosa* Thiele, 1898, *Craniella varians* Thiele, 1898, *Thenea calyx* Thiele, 1898 (from Tango).

After the pioneering works on demosponges of Western Japan, nobody has investigated them again in this area until the Japanese collegue, Tanita (1961b), reported on eight species of demosponges from Wagu in Mie Prefecture. Dr. Tanita, S. had studied the calcareous sponges of Japan, and in Japanese, he first reported demosponges from Western Japan. The report of Tanita (1961b) from Wagu contains the following eight species, including two new species: *Siphonochalina truncata* Lindgren, 1897, *Callyspongia confoederata* (Ridley, 1884), *Callyspongia waguensis* Tanita, 1961, *Toxadocia cylindrica* Tanita, 1961, *Paresperella macrosigma* (Lindgren, 1897), *Ceratopsis erecta* Thiele, 1898, *Acanthella simplex* Thiele, 1898, and *Discodermia japonica* Döderlein, 1884. Subsequently he studied demosponges from various Japanese waters, and has left the following invaluable contributions on demospongian fauna of Western Japan:

From Wagu, Mie Prefecture, 8 species (above described), (1961b).
From Kurushima Strait, Inland Sea of Japan, 18 species, (1961d).
From Ushitsu and East Coast of Noto Pen., 8 species, (1963).
From Tsukumo Bay, 10 species, (1964).
From off Kasumi, Hyogo Pref., 2 species, (1965b).
From off Kasumi and Coast of Tajima, 13 species, (1967).
From Ariake Sea, 24 species, (1968).
From Yuki, Tokushima Pref., 17 species, (1970b).
From Kii-Shirahama, 14 species, (1977).

Finally, the writer has studied the demospongian fauna of Western Japan since he first published the following preliminary work (Hoshino, 1971) on demosponge near the Mukaishima Marine Biological Station: "Fifteen sponges (Demospongiae) obtained from Mukaishima and its adjacent waters" (in Japanese).

IV. LOCALITIES WHERE MATERIALS WERE COLLECTED

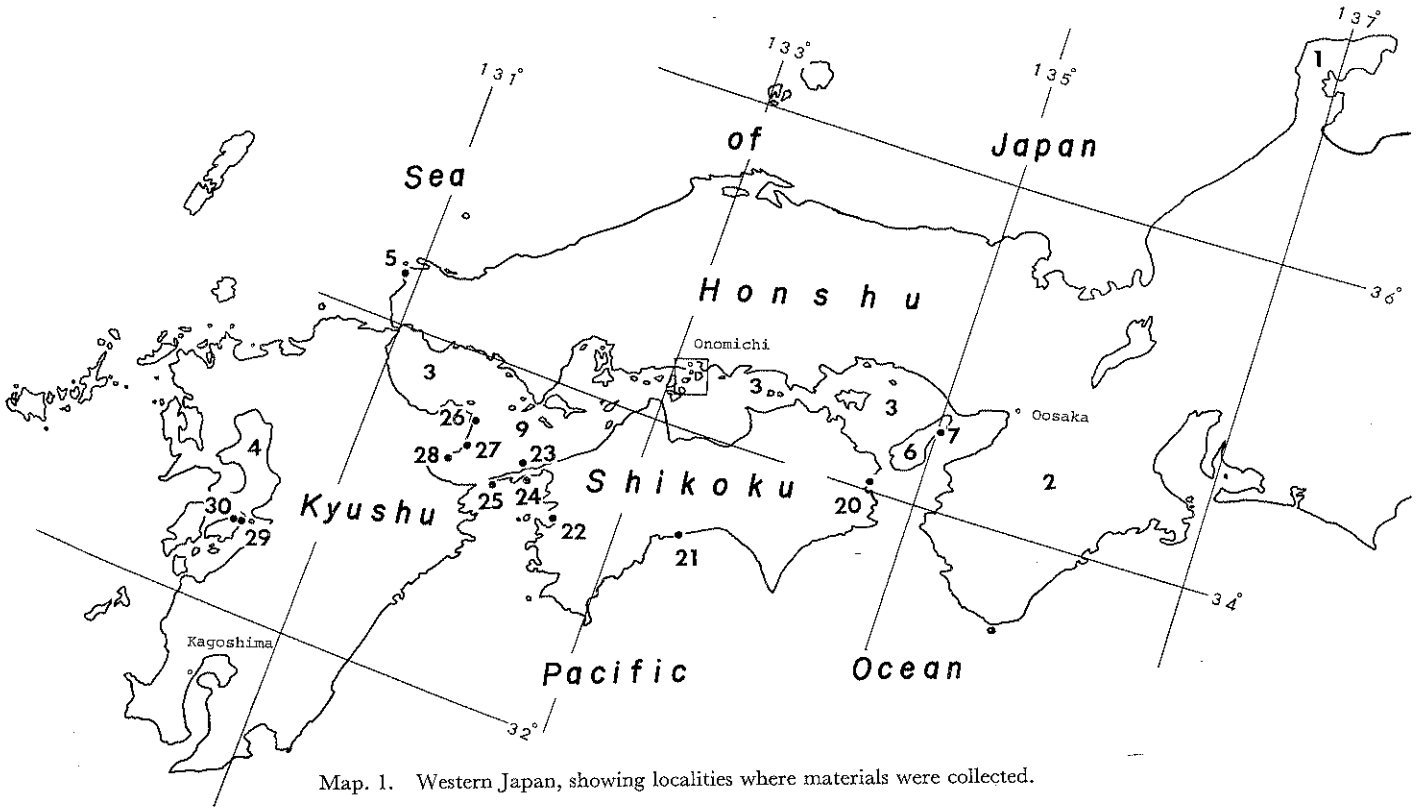
The materials in this study were collected for the most part from the Inland Sea of Japan, Mitsukue on Sata Peninsula (Ehime Pref., Shikoku), Uchinoura near the tip of Sata Peninsula, and near the Aitsu Marine Biological Station in the Ariake Sea (Kyushu).

The heading of "Specimen Number" gives the approximate area where the material was collected, such as:

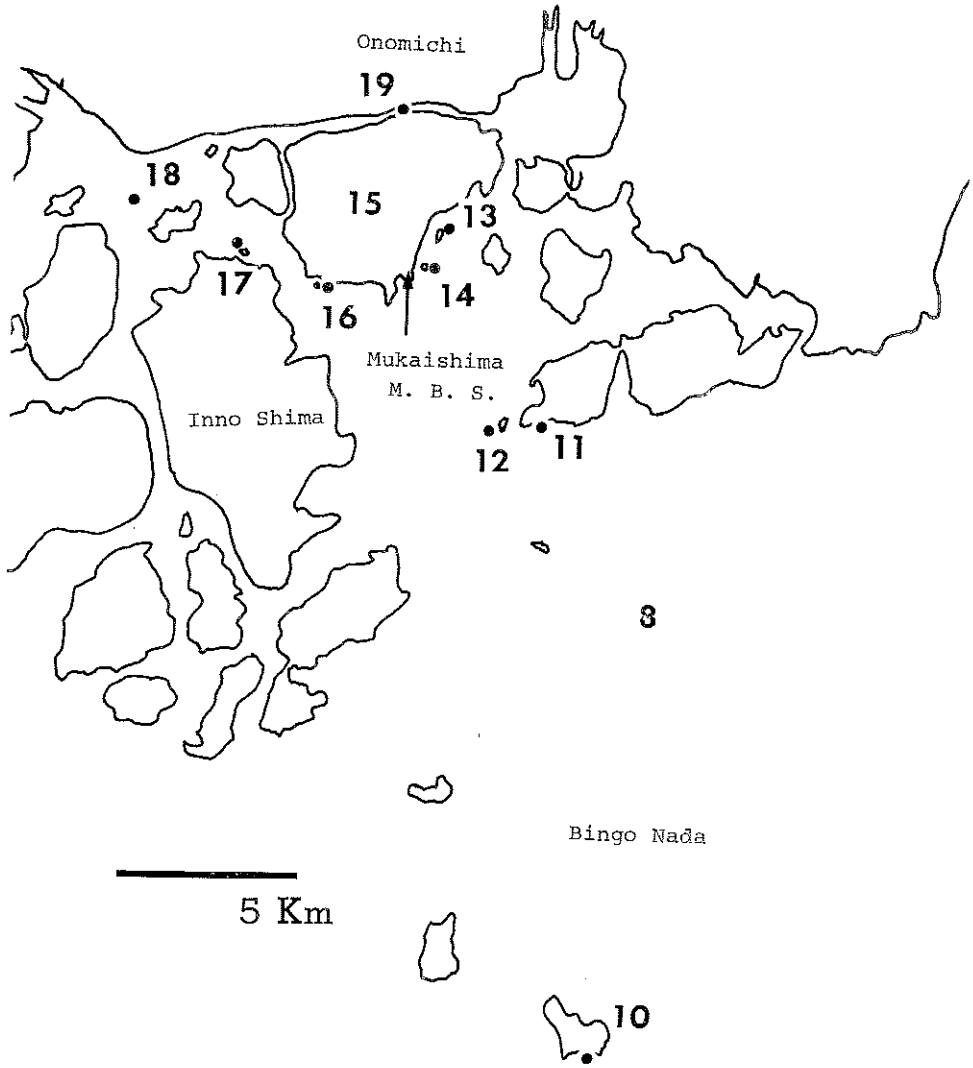
SIS : Inland Sea of Japan (Seto Inland Sea)
MIT: Mitsukue on Sata Peninsula
SAT : Uchinoura near the tip of Sata Peninsula
AR : Ariake Sea
TS : Hohoku-cho, on the coast of Hibiki-Nada in Yamaguchi Pref.
JAP : Various localities of Western Japan, excluding areas described above.

The locations named in "Material examined" are shown on map as follows;

1. Noto Peninsula
2. Kii Peninsula
3. Inland Sea of Japan
4. Ariake Sea
5. Hohoku-cho
6. Awajishima
7. Iwaya
8. Bingo-Nada
9. Iyo-Nada



Map. 1. Western Japan, showing localities where materials were collected.



Map. 2. Mukaishima and its vicinity, showing localities where materials were collected.

10. Uoshima
11. Yokoshima
12. Ategishima
13. Kamiebujima
14. Shimoebujima
15. Mukaishima
16. Sasajima
17. Shijushima
18. Hosonosu
19. Onomichi Channel
20. Tokushima
21. Usa
22. Uwajima
23. Mitsukue
24. Shionashi
25. Uchinoura
26. Kitaura
27. Kurotsusaki
28. Ooita Air Port
29. Matsushima Maeshima
30. Aitsu M. B. S.

V. EXPLANATION OF ITEMS USED IN SYSTEMATIC DESCRIPTIONS

The items used in systematic descriptions are as follows:

1. Species name

2. Synonymy
3. Material examined: The following are described in this item: Specimen Number, Designation of type specimen, Collection locality, and Date collected.
4. Dimensions: Dimensions of principal specimen. Dimensions of other specimens are described in the item, "Note".
5. Habitat
6. Shape: External form of the entire animal.
7. Color: Color name according to Color Dictionary (Shikimei Sokan) by Wada, S. (1935).
8. Consistency
9. Surface: Appearance of surface of sponge.
10. Ectosome and Endosome: Spicule arrangement at ectosome and in endsome.
11. Spicule: Names of spicules in described species and their morphology. Spicule measurements stated in this item are based upon the principal specimen. Those of other specimens are described in the item, "Note". Spicule measurements are stated as follows: Minimum—Mean—Maximum (Length) × Minimum—Mean—Maximum (Width) μm.
12. Distribution: Previously known localities in the world, and previouly known localities in Japan are described in the item of "In Japan".
13. Note: Dimensions of entire animal, spicule measurements, and so forth, for all specimens.
14. Remarks

VI. CLASSIFICATION

The system adopted in this work is mainly that of De Laubenfels (1936a). That of Bergquist (1970) was used for the order Axinellida and the order Halichondrida. According to Levi (1956d) the class Demospongia is divided into two subclass, Ceractinomorpha and Tetractinomorpha. Recently, Bergquist (1978) raised the order Homosclerophorida to the status of subclass, but the writer prefers the version of Levi (1956d).

The system used in this work is as follows:

Phylum Porifera
  Class Demospongia
    Subclass Ceractinomorpha
      Order Keratosa
      Order Haplosclerida
      Order Poecilosclerida
        Group Phorbasiformes
        Group Plocamiformes
        Group Microcioniformes
        Group Myxilliformes

Order Halichondrida
Subclass Tetractinomorpha
Order Axinellida
Order Hadromerida
Order Epipolasida
Order Choristida
Order Homosclerophorida

VII. SYSTEMATIC LIST OF SPECIES TREATED

Phylum Porifera Grant, 1836
Class Demospongia Sollas, 1885
Subclass Ceractinomorpha Levi, 1953
Order Keratosa Grant, 1861
Suborder Dendroceratida Minchin, 1900
Family Spongiidae Gray, 1867
1. *Spongia hispida* Lamarck, 1814
2. *Spongia zimmocca* Schmidt, 1862
3. *Ircinia collectrix* (Schulze, 1879)
4. *Ircinia fasciculata* (Pallas, 1766)
5. *Ircinia strobilina* (Lamarck, 1816)
6. *Polyfibrospongia* cf. *echina* De Laubenfels, 1934
7. *Cacosponigia lamellosa* (Esper, 1794)
8. *Cacosponigia scalaris* Schmidt, 1862
9. *Hyattella cribriformis* (Hyatt, 1877)
10. *Hyattella intestinalis* (Lamarck, 1814)
11. *Thorecta boleta* (Lamarck, 1815)

Family Dysideidae Gray, 1867
12. *Dysidea crawshayi* De Laubenfels, 1936

Order Haplosclerida Topsent, 1928
Family Haliclonidae De Laubenfels, 1932
13. *Haliclona (Haliclona) nishimurai* Tanita, 1977
14. *Haliclona (Haliclona) oculata* (Linne, 1759)
15. *Haliclona (Haliclona) onomichiensis* n. sp.
16. *Haliclona (Haliclona) ramosamassa* n. sp.
17. *Haliclona (Haliclona) sasajimensis* n. sp.
18. *Haliclona (Haliclona) sortitio* n. sp.
19. *Haliclona (Haliclona) violapurpura* n. sp.
20. *Haliclona (Reniclona) clathrata* (Dendy, 1895)
21. *Haliclona (Reniclona) densaspicula* n. sp.
22. *Haliclona (Reniclona) ellipsis* n. sp.
23. *Haliclona (Reniclona) lentus* n. sp.
24. *Haliclona (Reniclona) offerospicula* n. sp.
25. *Haliclona (Reniclona) permollis* (Bowerbank, 1866)

26. *Haliclona (Reniclona) permollisimilis* n. sp.
27. *Haliclona (Reniclona) punctata* n. sp.
28. *Haliclona (Reniclona) robustaspicula* n. sp.
29. *Haliclona (Reniclona) sataensis* n. sp.
30. *Haliclona (Reniclona) tachibanaensis* n. sp.
31. *Haliclona (Reniclona) tenuis* n. sp.
32. *Haliclona (Reniclona) tuberosa* (Dendy, 1921)
33. *Haliclona (Reniclona) viola* n. sp.
34. *Haliclona (Reniera) aquaeductus* (Schmit, 1862)
35. *Haliclona (Reniera) enormismacula* n. sp.
36. *Haliclona (Reniera) frondosa* n. sp.
37. *Haliclona (Reniera) palmata* (Ellis et Sollander, 1786)
38. *Haliclona (Reniera) implexa* (Schmidt, 1868)
39. *Haliclona (Reniera) surrufa* n. sp.
40. *Haliclona (Amphimedon) aitsuensis* n. sp.

Family Callyspongiidae De Laubenfels, 1936

41. *Callyspongia bispicula* Tanita, 1961
42. *Callyspongia elegans* (Thiele, 1899)
43. *Callyspongia elongata* (Ridley et Dendy, 1886)
44. *Callyspongia confoederata* (Ridley, 1884)
45. *Callyspongia ecklonia* n. sp.
46. *Callyspongia fibrosa* (Ridley et Dendy, 1886)
47. *Callyspongia flabelliformis* Tanita, 1968
48. *Callyspongia murex* n. sp.
49. *Callyspongia palmata* (Lamarck, 1813)
50. *Callyspongia patulus* n. sp.
51. *Callyspongia ramosa* (Gray, 1843)
52. *Callyspongia rectangularis* (Ridley et Dendy, 1886)
53. *Callyspongia robusta* (Ridley, 1884)
54. *Callyspongia subarmigera* (Ridley, 1884)
55. *Callyspongia variabilis* (Dendy, 1890)
56. *Callyspongia waguensis* Tanita, 1961
57. *Ceraochalina differentiata* Dendy, 1921
58. *Ceraochalina sphaericuslobatus* n. sp.
59. *Siphonochalina truncata* Lindgren, 1897

Order Poecilosclerida Topsent, 1928

Group Phorbasiformes De Laubenfels, 1936

Family Phorbasidae De Laubenfels, 1936

60. *Anchinoe novaezealandiae* Dendy, 1924
61. *Anchinoe purpurea* Tanita, 1961

Family Adociidae De Laubenfels, 1936

62. *Adocia cinerea* (Grant, 1827)
63. *Sigmadocia liber* n. sp.
64. *Sigmadocia strongylatus* (Lindgren, 1897)

65. *Sigmadocia vagabunda* (Schmidt, 1870)
66. *Toxadocia cylindrica* Tanita, 1961
67. *Toxadocia shimoebuensis* n. sp.
68. *Orina uwaensis* n. sp.
69. *Biminia ooita* n. sp.
70. *Pellina toxonisimilis* n. sp.
71. *Petrosia solida* n. sp.
72. *Petrosia solusstrongyla* n. sp.
73. *Petrosia spheroida* Tanita, 1967
74. *Petrosia ushitsuensis* Tanita, 1963
75. *Petrosia volcano* Hoshino, 1976
76. *Strongylophora corticata* Wilson, 1925

Family Coelosphacridae Hentschel, 1923

77. *Coelosphaera calcifera* (Burton, 1934)

Group Plocamiiformes De Laubenfels, 1936

Family Plocamiidae Topsent, 1928

78. *Lissoplocamia tokushima* Tanita, 1970

Group Myxilliformes De Laubenfels, 1936

Family Myxillidae Hentschel, 1923

79. *Myxilla bivalvia* Tanita, 1967
80. *Myxilla behringensis* Lambe, 1895
81. *Myxilla hiradoensis* new name
82. *Myxilla incrustans* (Johnston, 1842)
83. *Myxilla lobatus* n. sp.
84. *Myxilla parasitica* Lambe, 1893
85. *Myxilla productus* n. sp.
86. *Myxilla rosacea* (Lieberkühn, 1859)
87. *Myxilla setoensis* Tanita, 1961
88. *Hymedesmia uchinourensis* n. sp.

Family Tedaniidae Ridley et Dendy, 1887

89. *Acarnus bicladotylota* n. sp.
90. *Acarnus tenerus* Tanita, 1963
91. *Forecepia solustylota* Hoshino, 1977
92. *Iotorochota baculifera* Ridley, 1884
93. *Lissodendoryx isodictyalis* (Carter, 1882)
94. *Lissodendoryx rarus* n. sp.
95. *Lissodendoryx spinulosa* Tanita, 1968
96. *Tedania brevispiculata* Thiele, 1903
97. *Tedania levigotylota* n. sp.
98. *Tedania palola* n. sp.

Group Microcioniformes De Laubenfels, 1936

Family Microcionidae Hentschel, 1923

99. *Eurypon naikaiensis* n. sp.
100. *Microciona spinatoxa* n. sp.

101. *Thalysias acanthostyli* n. sp.
102. *Thalysias productitoxa* n. sp.
103. *Thalyseurypon kasumiensis* (Tanita, 1965)

Family Ophilitaspongiidae De Laubenfels, 1936

104. *Clathria fasciculata* Wilson, 1925
105. *Clathria frondifera* (Bowerbank, 1875)
106. *Clathria shirahama* Tanita, 1977
107. *Clathria spinispicula* Tanita, 1968
108. *Esperiopsis variussigma* n. sp.
109. *Litaspongia arborea* Tanita, 1968
110. *Mycale adhaerens* (Lambe, 1893)
111. *Mycale adhaerens nullarosette* n. subsp.
112. *Mycale adhaerens parvasigma* n. subsp.
113. *Mycale aegagropila* (Johnston, 1842)
114. *Mycale lingua* (Bowerbank, 1866)
115. *Mycale macginitiei* De Laubenfels, 1930
116. *Mycale magellanica* (Ridley, 1881)
117. *Mycale plumosa* (Carter, 1882)
118. *Mycale tenuisinuousitylostyli* n. sp.
119. *Ophilitaspongia noto* Tanita, 1963
120. *Paresperella macrosigma* (Lindgren, 1897)
121. *Paresperella undulata* Tanita, 1968

Family Amphilectidae De Laubenfels, 1936

122. *Amphilectus fucorum* (Esper, 1794)

Order Halichondrida Vosmaer, 1885

Family Halichondriidae Gray, 1867

123. *Halichondria japonica* (Kadota, 1922)
124. *Halichondria okadai* (Kadota, 1922)
125. *Halichondria oshoro* Tanita, 1961
126. *Halichondria panicea* (Pallas, 1776)
127. *Halichondria sitiens* (Schmidt, 1870)
128. *Halichondria surrubicunda* n. sp.

Family Hymeniacidonidae De Laubenfels, 1936

129. *Acanthella minuta* Tanita, 1968
130. *Acanthella simplex* Thiele, 1898
131. *Acanthella vulgata* Thiele, 1898
132. *Prianos duoacanthostyla* n. sp.
133. *Prianos inuisitatiacanthostyla* n. sp.
134. *Hymeniacidon adhaerens* (Thiele, 1898)

Subclass Tetractinomorpha Levi, 1953

Order Axinellida Bergquist, 1970

Family Axinellidae Ridley et Dendy, 1888

135. *Axinella convexa* n. sp.
136. *Axinella cylindratus* n. sp.

137. *Axinella incrustans* Thiele, 1898
138. *Axinella profunda* Ridley et Dendy, 1886
139. *Axinella profunda* var. *kurushima* Tanita, 1961
140. *Bubaris flabellata* Tanita, 1961
141. *Ceratopsis clavata* Thiele, 1898
142. *Ceratopsis erecta* Thiele, 1898
143. *Ceratopsis expansa* Thiele, 1898
144. *Ceratopsis ramosa* Thiele, 1898
145. *Homaxinella brevistyla* n. sp.
146. *Homaxinella echidnaea* (Ridley, 1884)
147. *Homaxinella tanitai* new name

Family Raspailiidae Hentschel, 1912

148. *Raspailia folium* Thiele, 1898
149. *Raspailia hirsuta* Tiele, 1898
150. *Raspailia microacanthoxea* Hoshino, 1976
151. *Raspailia trachystyla* Tanita, 1968

Order Hadromerida Topsent, 1894

Family Choanitidae De Laubenfels, 1936

152. *Anthosigmella raromicrosclera* (Dickinson, 1945)
153. *Choanites ficus* (Pallas, 1766)
154. *Choanites virgultosa* (Johnston, 1842)
155. *Latrunculia ikematsui* Tanita, 1968
156. *Oxylatrunculia acanthosanidastera* n. gen. and n. sp.
157. *Spirastrella abata* Tanita, 1961
158. *Spirastrella coccinea* (Duchassaing et Michelotti, 1864)
159. *Sperastrella insignis* Thiele, 1898
160. *Spirastrella panis* Thiele, 1898

Family Suberitidae Ridley et Dendy, 1886

161. *Aaptos niger* n. sp.
162. *Pseudosuberites kunisakiensis* n. sp.
163. *Ridleia peleia* De Laubenfels, 1954
164. *Suberites inflafoliatus* (Thiele, 1898)
165. *Suberites japonicus* Thiele, 1898
166. *Suberites sericeus* Thiele, 1898
167. *Terpios zeteki* (De Laubenfels, 1936)

Family Clionidae Gray, 1867

168. *Cliona celata* Grant, 1826
169. *Cliona vastifica* Hancock, 1849
170. *Cliona lobata* Hancock, 1849

Order Epipolasida Sollas, 1888

Family Tethyidae Gray, 1867

171. *Tethya aurantium* (Pallas, 1766)
172. *Tethya deformis* Thiele, 1898
173. *Tethya diploderma* Schmidt, 1870

174. *Tethya japonica* Sollas, 1888
Family Jaspidae De Laubenfels, 1936
175. *Jaspis hiwasaensis* Hoshino, 1977
176. *Jaspis duoaster* n. sp.
Family Sollasellidae Lendenfeld, 1887
177. *Epipolasis kushimotoensis* Hoshino, 1977
Order Choristida Sollas, 1880
Family Ancorinidae Schmidt, 1870
Subfamily Ancorininae Schmidt, 1870
178. *Penares incrustans* Tanita, 1963
179. *Thenea calyx* Thiele, 1898
Subfamily Stelletinae Sollas, 1888
180. *Stelletta atrophia* n. sp.
181. *Stelletta grubii* Schmidt, 1862
182. *Stelletta japonica* Lebwohl, 1914
183. *Stelletta maxima* Thiele, 1898
184. *Stelletta misakiensis* Lebwohl, 1914
185. *Stelletta morikawai* Tanita, 1961
186. *Stelletta naseana* Thiele, 1898
187. *Stelletta solida* Tanita, 1963
188. *Stelletta subtilis* (Sollas, 1886)
189. *Stelletta tetrafurcata* n. sp.
Family Craniellidae De Laubenfels, 1936
190. *Craniella globosa* Thiele, 1898
191. *Craniella globosa* var. *anamonaena* Tanita, 1968
192. *Craniella japonica* Lampe, 1886
193. *Craniella serica* (Lebwohl, 1914)
194. *Craniella varians* Thiele, 1898
Family Geodidae Gray, 1867
195. *Geodia exigua* Thiele, 1898
196. *Geodistrongyla strongyla* n. gen. and n. sp.
197. *Erylus placenta* Thiele, 1898
Family Kaliapsidae De Laubenfels, 1936
198. *Discodermia calyx* Döderlein, 1883
199. *Discodermia japonica* Döderlein, 1883
200. *Discodermia irregularis* Hoshino, 1976
201. *Discodermia kiiensis* Hoshino, 1977
202. *Siliquariaspongia japonica* n. gen and n. sp.
203. *Theonella swinhoei* Gray, 1868
Order Homosclerophorida Dendy, 1905
Family Halinidae De Laubenfels, 1934
204. *Plakortis simplex* Schulze, 1880
205. *Pachastrella tenuilaminalis* (Sollas, 1886)

VIII. SYSTEMATIC DESCRIPTIONS

Phylum Porifera Grant, 1836

Class Demospongia Sollas, 1885

Subclass Ceractinomorpha Levi, 1953

Order Keratosa Grant, 1861

Suborder Dendroceratida Minchin, 1900

Family Spongiidae Gray, 1867

Genus *Spongia* Linne, 1759

1. *Spongia hispida* Lamarck, 1814

(Fig. 1; Pl. 1, Fig. 1)

Spongia hispida Lamarck, 1814. p. 452, Pl. 3, fig. 6; De Laubenfels, 1948, p. 15.
Hircinia hispida: Ridley, 1881, p. 109.
Spongia irregularis: Topsent, 1933, p. 1.

Material examined[1]: MIT–085, Shionashi, 5–XI–1975; SAT–007–C, SAT–009–A, SAT–009–B, Uchinoura, 5–XI–1975.

Dimensions: $5 \times 5 \times 3$ cm (MIT–085).

Habitat: 3 m in depth, on a holdfast of the brown alga *Ecklonia*.

Shape: From the basal part which is almost encrusting to a thickness of 0.5 cm, several solid cylindrical branches clinging and anastomosing to roots of holdfast of *Ecklonia*.

Color: Ecru 08ED or Pinkish Cinnamon 08GB.

Consistency: Compressible but hard.

Surface: Conulose, conules 0.5–1.0 mm high and 0.5–1.0 mm apart, on entire surface.

Ectosome: Irregular reticulation of uncored fibers, about 30 μm in diameter, and fleshy dermis containing foreign spicules, and so forth.

Endosome: Generally, it is difficult to discriminate the primary from the secondary fibers, but since primary fibers are cored with foreign materials near the conules, they are easy to discriminate. Skeleton is an irregular reticulation of fibers, which are encrusted with sand, detritus, etc., throughout the entire length, 25–30 μm in thickness. Fibers anastomose at intervals of 100–500 μm, forming meshes which are 100–400 μm in diameter.

Distribution: Indian Ocean; Australia.

In Japan—Newly recorded.

Note: The four specimens are assigned to this species. This description is based on one of these specimens, MIT–085. Dimensions of other specimens are $1 \times 1 \times 3$ (height) cm, SAT–007–C; $0.5 \times 0.5 \times 3$ (h.) cm, SAT–009–A; and

[1] The materials examined in this work are deposited in the Mukaishima Marine Biological Station.

2×1×0.5 (h.) cm, SAT–009–B.

Remarks: This species is characterized by a ramose shape, each branch reaching 1 cm in thickness and 15 cm in length, followed by extensive branching.

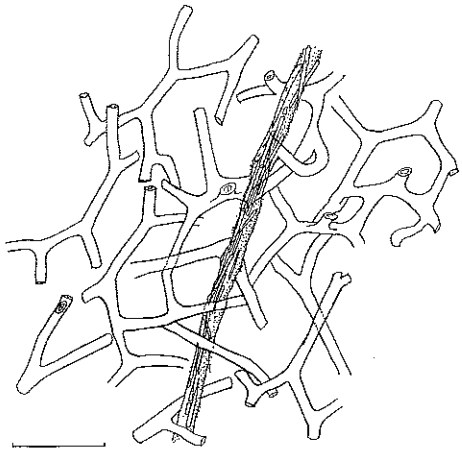


Fig. 1. *Spongia hispida* Lamarck. (SAT–009–B). Portion of skeleton in endosome. Scale: 200 μm.

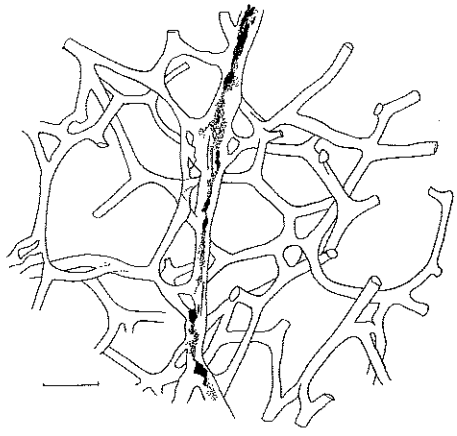


Fig. 2. *Spongia zimmocca* Schmidt. (SIS–001). Portion of skeleton in endosome. Scale: 200 μm.

2. *Spongia zimmocca* Schmidt, 1862

(Fig. 2; Pl. 1, Fig. 2)

Spongia zimnocca Schmidt, 1862, p. 23; De Laubenfels. 1948, p. 13, t-fig. 3.

Material examined: MIT–002, Mitsukue, 5–XI–1975; SIS–001, Mukaishima, 4–XI–1972; SIS–009, Mukaishima, 10–VIII–1972; SIS–010, Mukaishima, 30–X–1971; SIS–021, SIS–022, Mukaishima, 3–XI–1972, SIS–088, Mukaishima, 8–VII–1974.

Dimensions: 5×6×3 (height) cm, (MIT–002).

Habitat: 15 m in depth, on rocky substrate.

Shape: Irregular massive sponge, with numerous upright hollow branches 2–4 cm in height and 1 cm in width.

Color: Brick Red 22ME, (MIT–002)

Consistency: Very elastic and very tough.

Surface: Slightly conulose, almost even. Ill-developed conules less than 0.1 mm in height cover the entire surface. Oscules open at the tips of upright branches, and winding canals spread from oscules through walls of upright branches of the entire upper surface of sponge.

Ectosome: Fleshy dermis, containing a few foreign materials.

Endosome: Primary fibers are cored with sand grains, foreign spicules and detritus, and measure 30–40 μm in diameter. Secondary fibers are uncored, measure 20–40 μm in diameter, and form irregular polygonal networks, measur-

ing 100–800 μm in maximum dimension.

Distribution: Mediterranean; West Indian Region; Australia; Chili.

In Japan—Newly recorded.

Note: The seven specimens are assigned to this species. This description is based mainly one of these specimens, MIT–002. Dimensions of other specimens are as follows: 10×15×10 (Height) cm, SIS–001; 3×4×4 cm, SIS–009; 8×10×3 cm, SIS–010; 19×15×7 cm, SIS–021; 20×5×15 cm, SIS–022; and 11×11×7 cm, SIS–088. Color of other specimens are as follows: Etruscan Red 21KC to Raw Sienna 08PE, SIS–001; Dark Perilla Purple 33PK to Maple 07GD or Ivory Buff 04EB, SIS–010; and Tawny Olive 08LD, SIS–008.

Remarks: The specimens examined in this study resemble closely the subspecies *canaliculata* in De Laubenfels (1948).

Genus *Ircinia* Nardo, 1833

3. *Ircinia collectrix* (Schulze, 1879)

Oligoceros collectrix Schulze, 1879, p. 34.

Cacospongia collectrix: Polejaeff, 1884, p. 65; Hoshino, 1971, p. 25.

Distribution: Philippines.

In Japan–Awajishima (Kobe).

4. *Ircinia fasciculata* (Pallas, 1766)

(Fig. 3)

Spongia fasciculata Pallas, 1766, p. 381.

Ircinia fasciculata: De Laubenfels, 1948, p. 66; 1949c, p. 5; 1953, p. 513; Little, 1963, p. 34; Hechtel, 1965, p. 8; Tanita, 1967, p. 118, Pl. 2, fig. 10, Pl. 3, fig. 12; 1969, p. 80, fig. 13; 1970b, p. 102; Hoshino, 1970, p. 25; 1971, p. 23; 1975b, p. 13, Pl. 2, fig. 6; 1975c, p. 17, Pl. 1, fig. 1; Boury-Esnault, 1971, p. 342; Vacelet, et al., 1976, p. 101.

Material examined: MIT–062, MIT–068, MIT–070, MIT–078, MIT–079, Mitsukue, 5–XI–1975; SIS–096, Ategishima, 8–IX–1975; SIS–097, Hosonosu, 10–VII–1975.

Dimensions: 8×5×6 (height) cm, (SIS–096).

Habitat: Intertidal zone, on rocky substrate.

Shape: Irregular, massive sponge, with several ellipsoidal lobes.

Color: Glaucous Green 85EC or Dull Purplish Black.

Consistency: Remarkably elastic, very tough, and extremely hard when dry.

Surface: Conulose, conules 1–1.5 mm in height and 3–5 mm apart on lobe surface, but more sparsely conulose on the surface of the other part, excluding lobes. Oscules, 4–6 mm in diameter, open at the tips of several lobes.

Ectosome: Fleshy dermis is 40–50 μm in thickness and contains such foreign material as detritus, spong spicules, and sand grains.

Endosome: Fibro-reticulation. Fleshy part is densely packed with very

peculiar filaments that are characterictic in the genus *Ircinia*. Principal fibers are fascicular, and central fascicles are densely cored with such foreign material as sponge spicules, detritus and so forth. The diameters of the fibers range from 200 to 500 μm. It is difficult to accurately measure the diameter because each fiber is composed of smaller interlacing fibers. These interlacing fibers are as small as 50 μm in diameter. They are so closely placed to each other that there appears to be only a single very large fiber, pierced by window-like holes of 100–200 μm in maximum dimension. These fibers ascend toward the surface and terminate at the surface conules. They are connected by numerous secondary fibers, which are only slightly cored with foreign material. Filaments are 1–2 μm in diameter, are transparent, and are densely packed in the endosome, but the length of each filament can not be determined accurately.

Distribution: Cosmopolitan.

In Japan—Sea of Japan; Inland Sea of Japan; Yuki.

Note: The seven specimens are assigned to this species. This description is based on one of these specimens, SIS–096. Dimensions of other specimens are as follows: $6\times4\times3$ cm, SIS–097; $2\times4\times4$ cm, MIT–062; $1\times2\times4$ cm, MIT–068; $6\times4\times5$ cm, MIT–070; $10\times22\times8$ cm, MIT–078; and $13\times13\times6$ cm, MIT–079.

Remarks: The number and extent of filaments in the endosome vary widely between specimens. In this study, some specimens were densely packed with filaments while others were sparsely packed. The existence of filaments, in addition to the fascicular fibers of the endosome, is the most important criterion

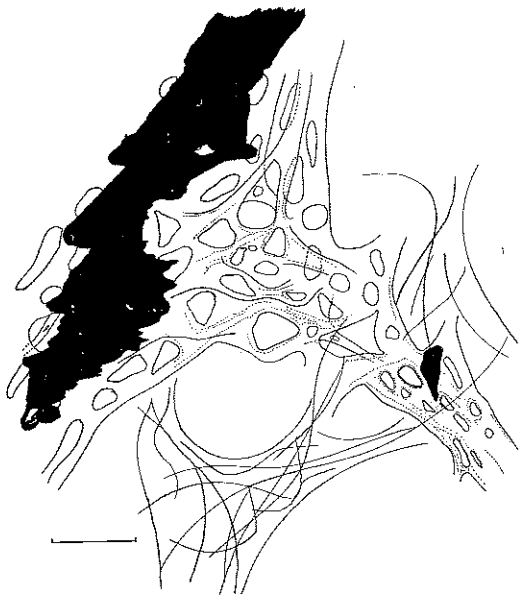


Fig. 3. *Ircinia fasciculata* (Pallas). (MIT–079). Portion of skeleton in endosome. Scale: 200 μm.

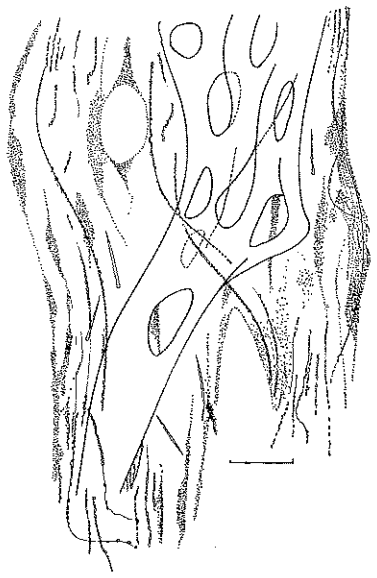


Fig. 4. *Ircinia strobilina* (Lamarck). (AR–1–76). Portion of skeleton in endosome. Scale: 200 μm.

in distinguishing the genus *Ircinia* from others. Meanwhile, the species of the genus *Polyfibrospongia* are characterized by fascicular fibers similar to those of the genus *Ircinia*, but are without filaments. Therefore, a specimen of the genus *Ircinia*, if the amount of filaments is very small, can not be discriminated from a species of the genus *Polyfibrospongia*.

5. *Ircinia strobilina* (Lamarck, 1816)

(Fig. 4)

Spongia strobilina Lamarck, 1816, p. 383.

Ircinia strobilina: De Laubenfels, 1936a, p. 18, Pl. 3, Pl. 4, fig. 3; 1948, p. 71; 1949c, p. 6; 1953, p. 514; Hechtel, 1965, p. 10; Boury-Esnault, 1973, p. 289; Vacelet, et al., 1976, p. 102; Hoshino, 1976c, p. 4, Pl. 1, fig. 1.

Material examined: AR–1–76, Matsushima Maeshima, 6–V–1972

Dimensions; $13 \times 13 \times 13$ cm.

Habitat: Intertidal zone, on gravel bottom.

Shape: Globular, massive sponge, approximately 13 cm in diameter.

Color: Pale Raw Umber 08PH.

Consistency: Elastic and very tough.

Surface: Conulose, conules 2–5 mm in height and 3–5 mm apart. Oscules are 3–5 mm in diameter and open over entire surface, 0.3–2.0 cm apart.

Ectosome: Fleshy dermis, 100–150 μm thick, containing much foreign materials.

Endosome: Primary fibers are fascicular with numerous, variable holes as windows and measure 200–400 μm in total diameter. The fascicles measure 50–80 μm in diameter and are sparsely cored. Secondary fibers are slightly fascicular, 60–100 μm in diameter, and are uncored. The filaments are densely packed in the fleshy portion, 1–2 μm in diameter, and are encrusted small particles throughout their entire length. Numerous foreign materials are contained in fleshy part below the ectosome.

Distribution: Mediteranean; West Indies; Australia; Jamaica.

In Japan—Ariake Sea.

Note: A single specimen, assigned to this species, was collected from Matsushima Maeshima in the Ariake Sea.

Remarks: This species is characterized by filaments densely encrusted with small unicellular algoid particles.

Genus *Polyfibrospongia* Bowerbank, 1877

6. *Polyfibrospongia* cf. *echina* De Laubenfels, 1934

(Fig. 5; pl. 1, Fig. 3)

Polyfibrospongia echina De Laubenfels, 1934, p. 25; 1948, p. 63.

Material examined: SIS–012, Mukaishima, 6–VIII–1973; SIS–042, Ategi-

shima, 20–VIII–1974; SIS–069, Mukaishima, 27–VIII–1969.

Dimensions: $4 \times 4 \times 5$ (height) cm, (SIS–069).

Habitat: Intertidal zone, on rocky substrate.

Shape: Irregular, or subspherical massive sponge, with several ellipsoidal lobes, occasionally with several cavities or breaks located at the massive portion of the sponge.

Color: Taupe Brown 30NI to Black, or Maple 07GD, or Orange Citrine 05NF.

Consistency: Very elastic, tough and difficult to tear apart.

Surface: Minutely conulose, conules 1–2 mm high, ca. 1 mm thick, and 2–3 mm apart. Oscules are 3–4 mm in diameter and open at the tips of several lobes. Pores invisible.

Ectosome: Well developed, with tough fleshy dermis containing considerable numbers of small foreign particles, such as sponge spicules and sand grains.

Endosome: Irregular reticulations of well developed, trellised primary fibers, cored with foreign materials. Secondary fibers are uncored. Primary fibers are markedly trellised, about 400 μm across, and ascend 300 μm apart from each other. All fibers of the trellis are 10–20 μm in diameter. These primary fibers are connected with irregularly reticulated secondary fibers 10–20 μm in diameter. The reticulated meshes are triangular to polygonal in shape, varying from 50 to 200 μm in maximum dimension.

Note: The three specimens are assigned to this tentative species. The de-

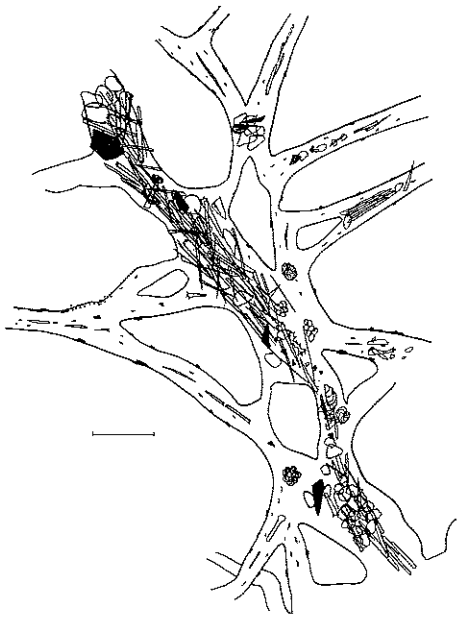


Fig. 5. *Polyfibrospongia* cf. *echina* De Laubenfels. (SIS–069). Portion of skeleton in endosome. Scale: 200 μm.

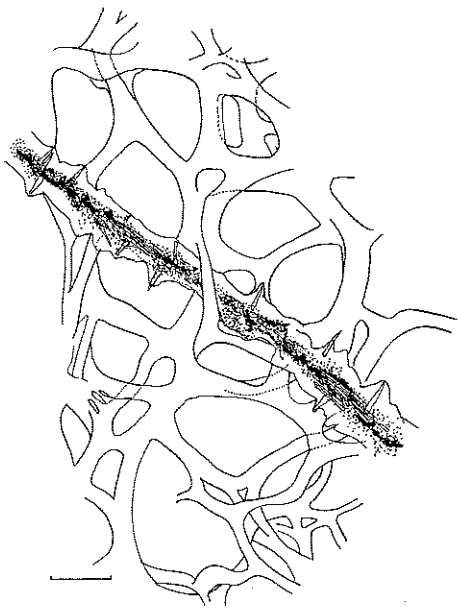


Fig. 6. *Hyattella intestinalis* (Lamarck). (TS–1–12). Portion of skeleton in endosome. Scale: 200 μm.

scription is based mainly on one of the specimens, SIS–069. Dimensions of other specimens are as follows: 10×4×8 cm, SIS–012; and 9×9×6 cm, SIS–042.

Remarks: The species belonging to this genus are characterized by a fiber structure similar to the genus *Ircinia*, but there are no filaments in the endosome.

Genus *Cacospongia* Schmidt, 1862

7. *Cacospongia lamellosa* (Esper, 1794)

Spongia lamellosa Esper, 1794, p. 270.
Spongia lamellaris: Lamarck, 1814, p. 441.
Cacospongia lamellosa: Ehlers, 1870, p. 15; De Laubenfels, 1948, p. 95; Tanita, 1967, p. 119, Pl. 3, figs. 13–14; Vacelet et al., 1971, p. 116.

Distribution: Australia; South Pacific.
In Japan—Takeno.

8. *Cacospongia scalaris* Schmidt, 1862

Cacospongia scalaris Schmidt, 1862, p. 27; De Laubenfels, 1948, p. 93; Tanita, 1970b, p. 102; Boury-Esnault, 1971, p. 340.

Distribution: Mediteranean.
In Japan–Yuki.

Genus *Hyattella* Lendenfeld, 1888

9. *Hyattella cribriformis* (Hyatt, 1877)

Sterospongos cribriformis Hyatt, 1877, p. 521
Hircinia clathrata Carter, 1881, p. 366.
Halma robusta Keller, 1889, p. 354.
Hyattella cribriformis: De Laubenfels, 1948, p. 39; Tanita, 1970b, p. 102, Pl. 2, fig. 13.

Distribution: Gulf of Manaar; Red Sea; West Indies; Australia.
In Japan—Yuki.

10. *Hyattella intestinalis* (Lamark, 1814)

(Fig. 6)

Spongia intestinalis Lamarck, 1814, p. 439.
Hyattella intestinalis: De Laubenfels, 1948, p. 41; Tanita, 1967, p. 118, Pl. 3, fig. 11; 1969, p. 79, Pl. 3, fig. 12; Hoshino, 1975c, p. 17, Pl. 2, figs. 11–13.

Material examined: TS–1–12, Hohoku-cho (Yamaguchi Pref.), 15–IX–1970.
Dimensions: 5×6×2 (height) cm.
Habitat: Unknown (specimen examined was washed ashore).
Shape: Curved, hollow cylindrical sponge, rising from basal mass. The wall of the cylinder possesses many small characteristic holes of 2–3 mm in diameter.

Color: Maple 07GD.

Consistency: Elastic and tough.

Surface: Smooth, uneven.

Ectosome: Reticulation of large meshes of thick fibers and small meshes of thin fibers within larger meshes. Larger meshes are 1–2 mm in diameter, and consist of thick fibers about 80 μm in diameter, and small meshes of thin fibers about 40 μm in diameter. Thick fibers are similar to those of the endosome.

Endosome: Irregular reticulation of primary fibers 70–90 μm in diameter and cored with foreign materials. The reticulated secondary fibers measure 40–80 μm in diameter and are uncored.

Distribution: Indian Ocean; Australia; West Indies.

In Japan—Sea of Japan.

Genus *Thorecta* Lendenfeld, 1888

11. *Thorecta boleta* (Lamarck, 1815)

(Fig. 7; Pl. 1, Fig. 4)

Alcyonium boletus Lamarck, 1815, p. 332.
Halispongia choanoides Bowerbank, 1872, p. 123.
Thorectandra corticatus Lendenfeld, 1889, p. 372.
Thorecta boleta: De Laubenfels, 1948, p. 107; Hoshino, 1971, p. 25, Pl. 2, fig. 1.

Material examined: MIT–109. Mitsukue. 4–XI–1973.

Dimensions: $13 \times 15 \times 32$ (height) cm.

Habitat: 15 m in depth, on muddy bottom.

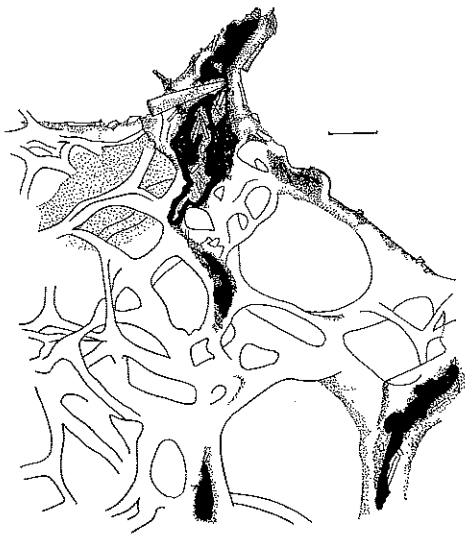


Fig. 7. *Thorecta boleta* (Lamarck). (MIT–109). Portion of skeleton in endosome beneath ectosome. Scale: 200 μm.

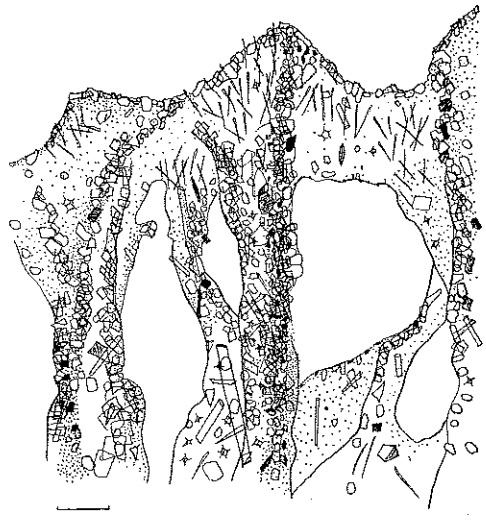


Fig. 8. *Dysidea crawshayi* De Laubenfels. (SIS–046). Portion of skeleton in endosome beneath ectosome. Scale: 200 μm.

Shape: Peculiar, massive sponge, that is an assemblage of board-like lobes 1–2 cm thick, developing upward.

Color: Vinaceous Cinnamon 15GC.

Consistency: Very elastic.

Surface: Conulose, conules 0.5–1.0 mm in height and 1–2 mm apart. Oscules are 5–6 mm in diameter and are lined on each edge of the board-like lobes.

Ectosome: Fleshy dermis contains abundant foreign sponge spicules and sand grains.

Endosome: Primary fibers are cored with foreign materials, 200–400 μm in diameter, and ascend to surface, 1–2 mm apart. These fibers are connected with an irregular network of secondary fibers, which are uncored and measure 40–50 μm in diameter.

Distribution: Australia.

In Japan—Inland Sea of Japan.

Family Disideidae Gray, 1867

Genus *Dysidea* Johnston, 1842

12. *Dysidea crawshayi* De Laubenfels, 1936

(Fig. 8; Pl. 1, Fig. 5)

Dysidea crawshayi De Laubenfels, 1936a, p. 28; 1948, p. 145; 1953. p. 515.

Material examined: SIS–046, Shijushima, 1–VII–1970.

Dimensions: $8 \times 2 \times 0.7$ (thickness) cm.

Habitat: Intertidal zone, on rocky substrate.

Shape: Thin, encrusting sponge of 0.1–1.0 cm thickness with several swells opening in oscules at their summits.

Color: Orange 16PA.

Consistency: Slightly compressible, tough.

Surface: Conulose, conules less than 0.2 mm in height and less than 1 mm apart. Oscules open at the summits of swells. Pores invisible.

Ectosome: Fleshy dermis, 50–300 μm in thickness, is densely packed with foreign materials such as detritus, sponge spicules, protozoan shells and so forth.

Endosome: Primary fibers are densely cored with foreign materials and ascend to the surface. They measure 100–500 μm in diameter, and ramify in places. Secondary fibers are cored with foreign materials, measure 100–200 μm in diameter, and irregularly connect with the primary fibers.

Distribution: West Indies.

In Japan—Newly recorded.

Remarks: This species is characterized by a bright orange color. The value of coloration is very important in sponges with no spicules, but this criterion must not be overestimated or underestimated; therefore, we must accumulate data about coloration in sponges for evaluation of its values as a taxonomic character.

Order Haplosclerida Topsent, 1928

Family Haliclonidae De Laubenfels, 1932

Genus *Haliclona* Grant, 1835

Subgenus *Haliclona* Grant, 1835 sensu Wiedenmayer, 1977

13. *Haliclona (Haliclona) nishimurai* Tanita, 1977

Haliclona nishimurai Tanita, 1977, p. 30, Pl. 1, fig. 1, t-fig. 1.

Distribution: In Japan—Kanayama Bay, Shirahama.

Remarks: This species is found in the Inland Sea of Japan also, but the writer did not have a specimen for study. According to Tanita (1977), this species has a stout oxeon measuring 135–150×9–10 μm, and an interstitial oxeon measuring 115–130×5–6 μm.

14. *Haliclona (Haliclona) oculata* (Linne, 1759)

(Fig. 9; Pl. 1, Fig. 6)

Spongia oculata Linne, 1759, p. 1348.

Haliclona oculata: De Laubenfels, 1949a, p. 9, figs. 4–5; Hartman, 1958, p. 52, figs. 16–20; Tanita, 1958, p. 129, Pl. 1, figs. 1–2, t-fig. 1; 1961d, p. 338, Pl. 1, fig. 1; 1970a, p. 89, Pl. 1, figs. 1–3.

Material examined: SIS–061, Mukaishima, ?–V–1971; SIS–103, Mukaishima, 25–V–1975.

Dimensions: 5×4×3 (height) cm, (SIS–061).

Habitat: Intertidal zone.

Shape: Thin, less than 1 cm thick, encrusting, with numerous erect hollow cylindrical tubes, 3 cm high with open oscules at the top. These tubes are 0.4–0.7 cm in diameter, and develop singularly, not aggulutinating with the others.

Color: Ivory Buff 04EB or Ecru 08ED.

Consistency: Markedly soft, not tough.

Ectosome: No dermal specialization.

Endosome: Reticulation of primary, bispicular or trispicular, tracts with isodictyal networks connecting the primary tracts. These primary tracts run to the surface, roughly parallel, 100–150 μm apart.

Spicule: Oxeon only—Fusiform, smooth, weakly bent at the middle, tapering to each end and sharply pointed. Size range 160–161–165×5–5–6 μm (SIS–061).

Distribution: Cosmopolitan.

In Japan — Matsushima Bay; Oginohana Bay, Inland Sea of Japan.

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
SIS–061	5×4×3 (height) cm	160–161–165×5–5–6
SIS–103	4×4×3 (〃)	125–147–150×3–4–6

Remarks: This species is characterized by having a hollow cylindrical tube. Tanita (1958) described this species from Matsushima Bay and Oginohana Bay, and his specimens differ slightly from those of this study in spicule measurement. He described the spicule size of his specimen as 100–125 × 6–8 μm which is slightly shorter and thicker than those of this study. Hartman (1958) studied the size variation of spicules in this species and, according to his study, the spicule sizes of this study and Tanita (1958) are included in the range of variation.

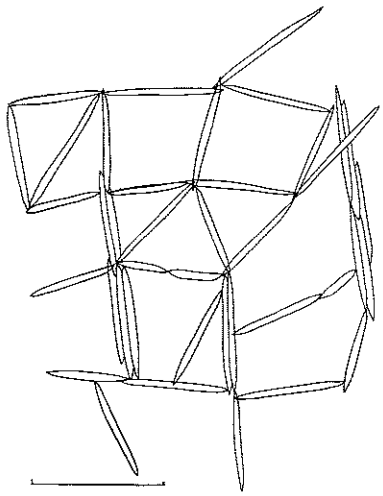


Fig. 9. *Haliclona (Haliclona) oculata* (Linne). (SIS–061). Portion of skeleton in endosome. Scale: 150 μm.

15. *Haliclona (Haliclona) onomichiensis* n. sp.

(Fig. 10; Pl. 1, Fig. 7)

Material examined: SIS–055 (Holotype), Kamiebujima, 25–V–1970; SIS–059, Onomichi Channel, 29–I–1972; SIS–114, Mukaishima, I–VII–1975; SIS–117, Kamienujima, 28–V–1975; SIS–122, Shijushima, 11–VII–1975.

Dimensions: 4 × 4 × 6 (height) cm, (SIS–055).

Habitat: Intertidal or subtidal zone.

Shape: Ramose sponge, with several erect, irregular branches, 1–1.5 cm in diameter. Occasionally hemispherical or irregular massive.

Color: Grenadine Pink 21IA, Maple 07GD, Indian Lake 29MC, Pansy Purple 30NF.

Consistency: Very soft, not tough.

Surface: Smooth to touch, uneven due to swelling of surface, 0.5 cm high and 1.0 cm in diameter. Oscules are 0.2–0.3 cm across, open in places, or occasionally invisible. Pores invisible.

Ectosome: No dermal specialization.

Endosome: Reticulation of vague, loose spicule tracts. The primary fibers ascend from the deep part to the surface with solitary spicules or irregular unispicular reticulation as the secondary fibers. Primary tracts consist of ten or

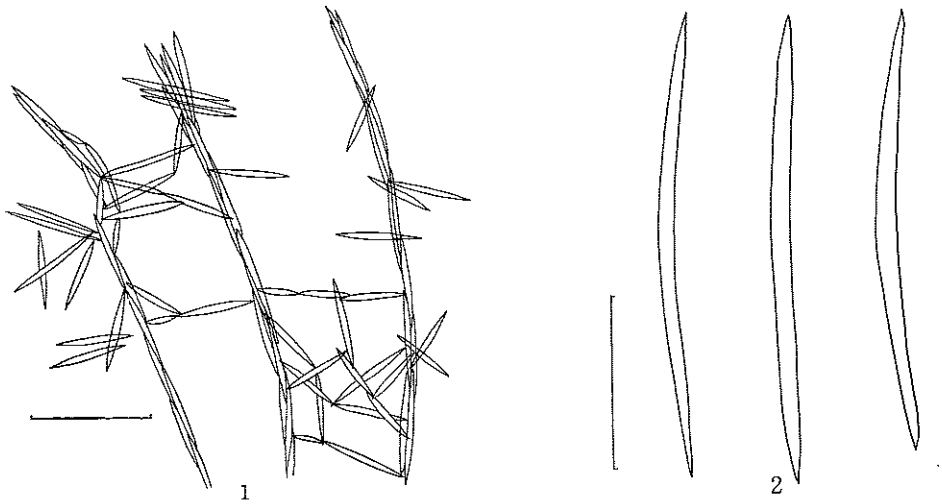


Fig. 10. *Haliclona (Haliclona) onomichiensis* n. sp. (SIS-055, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

more rows of spicules, 20–50 μm in diameter, ascending 150–250 μm apart.

Spicule: Oxcon only—Fusiform, smooth, straight to slightly bent at the middle, and tapering to each, sharply pointed end. Size range 125–136–150 × 5–6–7 μm (SIS–055).

Note:

	Dimensions and form of specimen		Spicule measurements
			Oxcon
SIS–055	4×4×6 cm	ramose	125–136–150×5–6–7
SIS–059	6×6×3	massive	100–126–140×3–6–7
SIS–114	3×3×4	ramose	115–126–143×4–7–10
SIS–117	6×2×2	massive	115–134–155×4–8–10
SIS–122	4×4×2	massive	115–131–150×4–7.5–9

Remarks: This species is characterized by having very loose spicule tracts as primary fibers. The external form of this species varies from ramose to massive, but the skeletal morphology is specific.

16. *Haliclona (Haliclona) ramosamassa* n. sp.

(Fig. 11; Pl. 2, Fig. 1)

Material examined: SIS–087 (Holotype), Mukaishima, 5–III–1972.
Dimensions: 10×10×6 (height) cm.
Habitat: Intertidal zone.

Shape: Distinctively ramose sponge with numerous cylindrical branches irregularly rising form the substratum to form a single branchy mass. The branches are 0.4–0.6 cm across, occasionally 1.0 cm, and ramify in places or grow together.

Color: Pansy Purple 30NF.

Consistency; Very elastic, not tough.

Surface: Minutely hispid, even. Oscules invisible with pores of ca. 0.1 mm across scattered on surface.

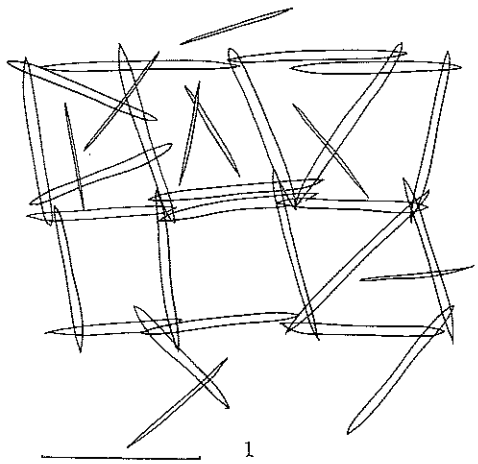
Ectosome: No dermal specialization.

Endosome: Subisodictyal reticulation in inner part of sponge, and near the surface with vague tracts of oxea, 20–30 μm in diameter, developing. These ascend, 100–150 μm apart, to the surface. Numerous free spicules are found in the flesh.

Spicule: Oxeon only, with two size modes.

Stout oxeon — Hastate, smooth, gently curved, each end sharply pointed. Size range 200–217–240 × 9–10–11 μm.

Slender oxeon — Fusiform, smooth, straight to slightly bent at the middle, with each end sharply pointed. Size range 160–165–170 × 3–4–5 μm. Spicules of



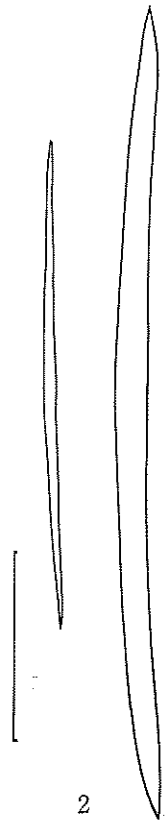


Fig. 11. *Haliclona (Haliclona) ramosamassa* n. sp. (SIS–087, Holotype).

1. Portion of skeleton in endosome. Scale: 200 μm. 2. Spicule; Stout oxeon and slender oxeon. Scale: 50 μm.

this type are found abundantly as free spicules in the flesh.

Remarks: This species is characterized in external form by a branchy mass and in having numerous free spicules in the flesh, and oxea of two size modes.

17. *Haliclona (Haliclona) sasajimensis* n. sp.

(Fig. 12; Pl. 2, Fig. 2)

Material examined: SIS–035 (Holotype), Sasajima, 27–VII–1969 (two fragments of same specimen).

Dimensions: $3\times2\times2$ (height) cm and $2\times2\times3$ (height) cm.

Habitat: Intertidal zone.

Shape: Irregular massive or short, erect massive.

Color: Ivory Buff 04EB.

Consistency: Very soft.

Surface: Smooth to touch. Several oscules, 2–3 mm across, scattered on the surface near the summit of the sponge.

Ectosome: No dermal specialization.

Endosome: Subisodictyal reticulation of oxea in all parts of sponge.

Spicule: Oxeon only — Hastate, smooth, slightly arched, with each end sharply pointed. These spicules are recognized as having two size modes. Size range 126–128–130 × 7–8–9 μm and 108–114–120 × 3–4–5 μm.

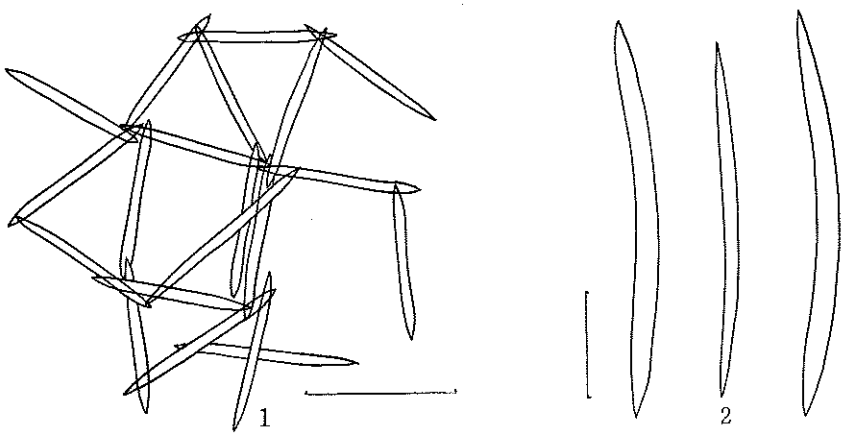


Fig. 12. *Haliclona (Haliclona) sasajimensis* n. sp. (SIS–035, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 30 μm.

Remarks: This species is characterized in having two size modes of oxea and subisodictyal reticulation.

18. *Haliclona (Haliclona) sortitio* n. sp.

(Fig. 13; Pl. 2, Fig. 3)

Material examined: MIT–074 (Holotype), Mitsukue, 5–XI–1975.
Dimensions: $3 \times 1 \times 1$ cm.
Habitat: Subtidal zone, 15 m in depth.
Shape: Fragment of irregular, solid, elongated sponge.
Color: Laelia Pink 33ED.
Consistency: Hard, incompressible.
Surface: Smooth to touch, oscules and pores invisible.
Ectosome: No dermal specialization.
Endosome: Fairly regular reticulation as a lottery of primary tracts containing ten or more rows of oxea with the secondary fibers being unispicular or containing a few rows of spicules. Primary tracts are 30–50 μm across, running to the surface 150–200 μm apart. Primary tracts are connected with the secondary fibers as a lottery. In the inner part of the sponge, however, subisodictyal reticulation replaces the reticulation described above.

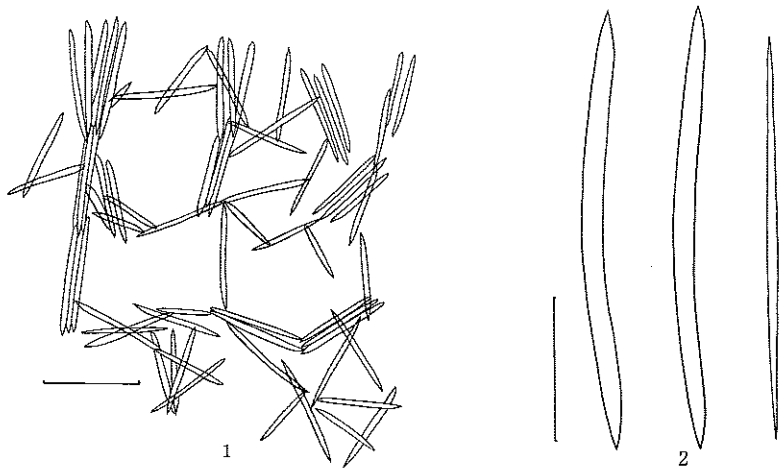


Fig. 13. *Haliclona (Haliclona) sortitio* n. sp. (MIT–074, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

Spicule: Oxeon only — Hastate, smooth, and slightly arched, tapering to sharply pointed ends. Size range 145–158–170 $\times$ 5–7–8 μm.
Remarks: This species is characterized by fairly regular reticulation of the skeleton as a lottery.

19. *Haliclona (Haliclona) violapurpura* n. sp.

(Fig. 14; Pl. 2, Fig. 4)

Material examined: SIS–138 (Holotype), Mukaishima, 1–VII–1975.
Dimensions: $6 \times 6 \times 3$ (height) cm.
Habitat: Subtidal zone, 3 m in depth.
Shape: Irregular ramose, with numerous, thin branches, 3–4 cm high and

2–3 mm wide, irregularly growing from a thick (1–2 cm diameter) basal mass.

Color: Pansy Purple 30NF.

Consistency: Very soft, not tough.

Surface: Smooth to touch, very minutely hispid. Oscules are 2–3 mm across and open in places. Pores invisible.

Ectosome: No dermal specialization.

Endosome: Subisodictyal reticulation with very vague tracts composed of several rows of spicules, vertically ascending to the surface.

Spicule: Oxeon only — Smooth, intermediate between hastate and fusiform, straight to slightly arched or bent at the middle, with each end sharply pointed. Size range 180–197–209 × 6–7.7–10 μm.

Remarks: This species is characterized by subisodictyal reticulation with very rague primary tracts. The spicule size of this species is larger than any species of the subgenus *Haliclona* collected in this study.

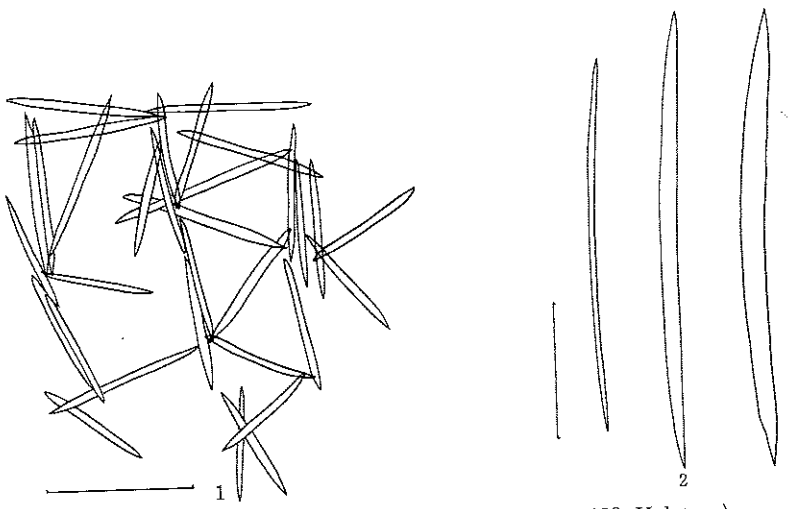


Fig. 14. *Haliclona (Haliclona) violapurpura* n. sp. (SIS–138, Holotype).
1. Portion of skeleton in endosome. Scale: 200 μm. 2. Spicule; Oxea. Scale: 50 μm.

Subgenus *Reniclona* De Laubenfels, 1954

20. *Haliclona (Reniclona) clathrata* (Dendy, 1895)

Reniera clathrata Dendy, 1895, p. 237.
Haliclona clathrata: Burton, 1934b, p. 532; Bergquist, 1961a, p. 35; Tanita, 1965a, p. 46, Pl. 1, fig. 1; Hoshino, 1970, p. 23, fig. 2(3), fig. 3 (6).

Distribution: Cosmopolitan.

In Japan — Sado; Inland Sea of Japan.

Remarks: This species was first recorded in Japan by Sado by Tanita (1965a) and was subsequently recorded from the Inland Sea of Japan by Hoshino (1970). According to Tanita (1965a), this species has oxea only, measuring 75–100 × 5 μm.

21. *Haliclona (Reniclona) densaspicula* n. sp.

(Fig. 15; Pl. 2, Fig. 5)

Material examined: SIS–062 (Holotype), Shijushima, 10–VII–1970; MIT–014, Mitsukue, 5–XI–1975.

Dimensions: $3\times3\times1$ (Thickness) cm, (SIS–062).

Habitat: Intertidal or subtidal zone.

Shape: Small, thin less than 0.5 cm thick, hilly encrusting on surface of barnacle or bivalve shell.

Color: Brown 17LF or Hay's Russet 20OH.

Consistency: Hard and fragile.

Surface: Smooth to touch, even. Oscules, 0.2–0.5 cm across, numerously or infrequently open on the surface. Pores invisible.

Ectosome: No dermal specialization.

Endosome: Isodictyal or subisodictyal reticulation. Numerous free oxea from reticulation are found in the flesh.

Spicule: Oxeon only — Hastate, smooth, straight to gently curved, with each end sharply pointed. Size range 185–217–250×3–10–15 μm (SIS–062).

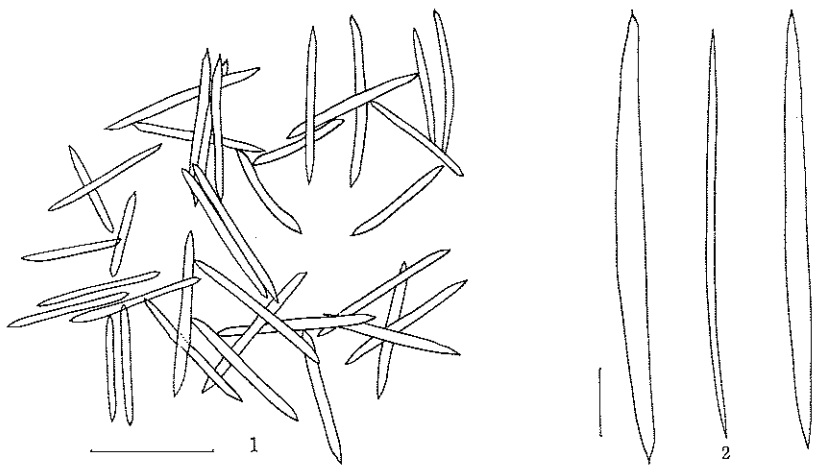


Fig. 15. *Haliclona (Reniclona) densaspicula* n. sp. (SIS–062, Holotype).
1. Portion of skeleton in endosome. Scale: 200 μm. 2. Spicule; Oxea. Scale: 30 μm.

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
SIS–062	$3\times3\times1$ (thickness) cm	185–217–250×3–10–15
MIT–014	$6\times6\times0.5$–1.0 (〃)	170–209–230×8–10–12

Remarks: This species is characterized by having large and numerous free oxea in the flesh.

22. *Haliclona (Reniclona) ellipsis* n. sp.

(Fig. 16; Pl. 2, Fig. 6)

Material examined: SIS–024 (Holotype), Iyonada, 20–V–1970; SIS–036, Mukaishima, 27–VIII–1969; SIS–079, Onomichi, 5–III–1972; SIS–113, SIS–134, Sasajima, 11–VI–1975; SIS–150, Sasajima, 21–I–1976; SAT–006 (part), Uchinoura, 5–XI–1975.

Dimensions: $3 \times 4.5 \times 1.2$ (thickness) cm, (SIS–024).

Habitat: Intertidal or shallow subtidal zone.

Shape: Small, ellipsoidal sponge, resembling pumice stone in appearance.

Color: Maple 07GD, Isabella Color 05GC, Purple Drab 29IG, Ivory Buff 04EB or Pansy Purple 30NF.

Consistency: Very soft, very elastic, but not especially tough.

Surface: Smooth to touch, even. Several oscules 1–2 to 2–3 mm across are scattered on the surface. Occasionally the environs of the oscules are slightly swollen. Occasionally numerous pores less than 0.5 mm across occur over the entire surface. Pores generally microscopic.

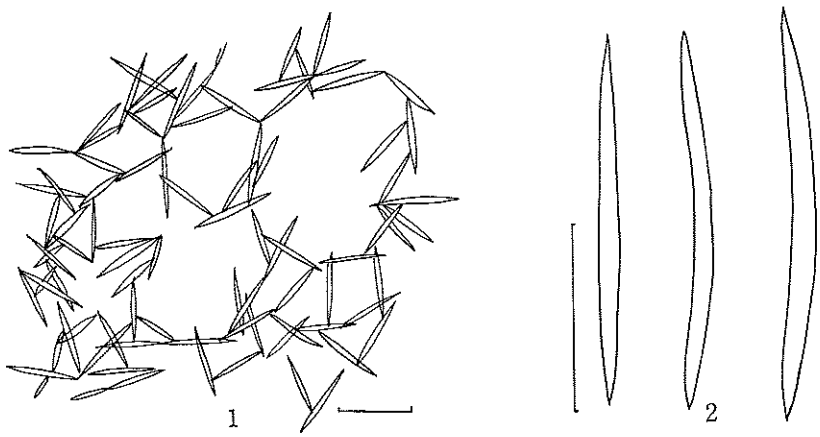


Fig. 16. *Haliclona (Reniclona) ellipsis* n. sp. (SIS–024, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

Ectosome: No dermal specialization.

Endosome: Irregular, isodictyal reticulation. These meshes are mostly triangular in shape, or more rarely, polygonal. Occasionally very vague tracts are formed near the surface.

Spicule: Oxeon only — Hastate, slightly arched, with both ends sharply pointed. Size range 90–102–120 × 4–5–6 μm (SIS–024). Occasionally, speci-

men are found with oxea irregularly swollen at middle.

Note:

	Dimensions of specimen	Spicule measurements
		Oxcon
SIS–024	3×4.5×1.2 cm	90–102–120×4–5–6
SIS–036	4.5×4.5×2	125–141–155×4–5–7
SIS–079	5×5×4	100–119–130×5–6–6
SIS–113	8×4×2	90–113–135×2–4–6
SIS–134	9×5×2	93–108–125×3–4–5
SIS–150	4×3×1	122–136–145×2–4.3–6
SAT–006	4×2×0.5	120×3–153×8

Remarks: This species is characterized by an ellipsoidal external shape and a resemblance to pumice stone. This species resembles to *Haliclona (Reniclona) permollis* (Bowerbank), *Haliclona (Reniclona) tachibanaensis* n. sp., and *Haliclona (Reniclona) tenuis* n. sp. in spicule measurement, but is easily distinguished from *H. (R.) permollis* by external shape, and from the two latter by spicule arrangement.

23. *Haliclona (Reniclona) lentus* n. sp.

(Fig. 17; Pl. 2, Fig. 7)

Material examined: AR–1–55 (Holotype), AR–1–56 AR–1–59, Matsushima Maeshima, 3–V–1972.

Dimensions: 5×3×2 cm (AR–1–55).

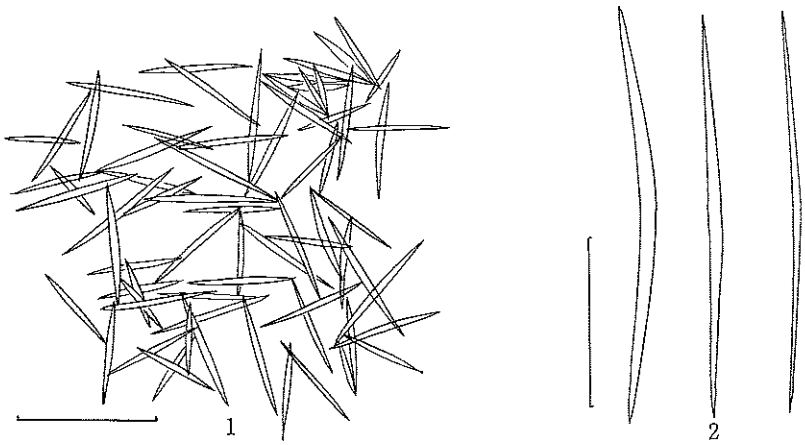


Fig. 17. *Haliclona (Reniclona) lentus* n. sp. (AR–1–55, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

Habitat: Intertidal zone, low tide subzone, on rocky substrate.

Shape: Irregular, small massive or fairly thick encrusting, 1–2 cm thick.

Color: Maple 07GD.

Consistency: Very soft, compressible, and tough. This species rarely changes in quality following desiccation.

Surface: Minutely conulose, even. Conules, less than 0.5 mm in height, scattered over the entire surface, 0.4–0.5 mm apart. Oscules of 2–3 mm in diameter open in places. Pores invisible.

Ectosome: No dermal specialization.

Endosome: Subisodictyal arrangement or irregular reticulation of oxea, never constituting tracts.

Spicule: Oxeon only — Smooth, fusiform, slightly bent at the middle, each tapering to a pointed end. Size range 120–131–145 × 3–4–6 μm (AR–1–55).

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
AR–1–55	5 × 3 × 2 cm	120–131–145 × 3–4–6
AR–1–56	3 × 3.5 × 1	125–134–145 × 4–5–8
AR–1–59	4 × 2 × 2	120–140–155 × 4–5–7

Remarks: This species closely resembles *Haliclona (Reniclona) punctata* n. sp. in external appearance, but is easily distinguished from the latter by spiculation.

24. *Haliclona (Reniclona) offerospicula* n. sp.

(Fig. 18; Pl. 2, Fig. 8)

Material examined: SIS–090–4–b (Holotype), Sasajima, 11–VI–1975.

Dimensions: 2 × 1 × 0.5 (thickness) cm.

Habitat: Intertidal zone.

Shape: Small, irregular, thin, found attached to the surface of an annelid tube.

Color: Ivory Buff 04EB.

Consistency: Slightly compressible, fragile.

Surface: Smooth to touch, even. A few oscules, ca. 2 mm across, open in places. Pores microscopic.

Ectosome: No dermal specialization.

Endosome: Oxea ascend in a row to the surface as primary tracts, 40–50 μm apart. These unispicular tracts are irregularly connected with separate oxea.

Spicule: Oxeon only — Smooth, thin, straight to slightly curved, with each end sharply pointed. Size range 75–82–90 × 2–2.8–3 μm.

Remarks: This species is characterized by having thin tender spicules, and by the fragile arrangement of the spicules.

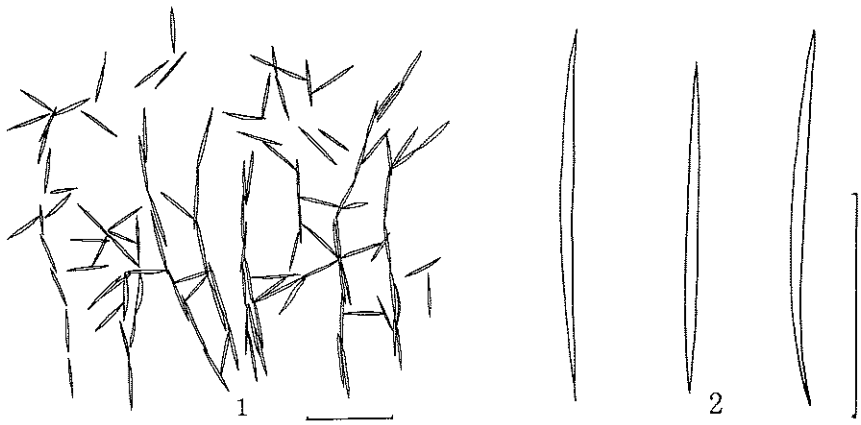


Fig. 18. *Haliclona (Reniclona) offerospicula* n. sp. (SIS–090–4–b, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

25. *Haliclona (Reniclona) permollis* (Bowerbank, 1866)

(Fig. 19)

Isodictya permollis Bowerbank, 1866, p. 278; 1874, p. 123, Pl. 48, figs. 9–10.

Haliclona permollis: De Laubenfels, 1936b, p. 444; 1939, p. 1; 1942, p. 263; 1949a, p. 11; Tanita, 1958, p. 130, Pl. 1, figs. 3–4, t-fig. 2; 1961d, p. 338; 1965a, p. 45; 1967, p. 113; 1968, p. 41; 1969, p. 71; Kim et al, 1968, p. 38. Pl. 1, fig. 1, t-fig. 2; Rho et al, 1969, p. 154; Hoshino, 1970, p. 23; 1971, p. 24; 1974, p. 8.

Haliclona (Reniclona) permollis: De Laubenfels, 1954a, p. 67, t-fig. 38.

Material examined: SIS–049, Sasajima, 27–VIII–1969; SIS–076, Mukaishima, 29–VIII–1969; SIS–090–1–a, SIS–090–5–a, Sasajima, 21–I–1976; SIS–119, Shijushima, 11–VII–1975; SIS–127, Sasajima, 11–VI–1975; SIS–128, Kamiebujima, 28–V–1975; SIS–147, Mukaishima, 9–VII–1975; SIS–157, Sasajima, 21–I–1976; MIT–083, Shionashi, 5–XI–1975; JAP–021, Usa, 12–VI–1976.

Dimensions: $3 \times 5 \times 1$ (thickness) cm, (MIT–083).

Habitat: Intertidal or subtidal zone, on rocky substrate.

Shape: Irregular encrusting or thin massive, with or without low exhalent chimneys.

Color: Pansy Purple 30NF, Indian Lake 29MC, or Villet Red 40PE.

Consistency: Soft, not tough in life, and slightly compressible when dry.

Surface: Smooth to touch, even or uneven. Oscules, 0.2–0.3 cm in diameter, open at the top of the low exhalent chimneys. These chimneys are less than 1.5 cm in height and 0.5–1.0 cm across.

Ectosome: No dermal specialization.

Endosome: Isodictyal reticulation with scant spongin.

Spicule: Oxeon only — Smooth, hastate, very slightly arched, with both ends abruptly and sharply pointed. Size range 80–95–104 × 3–5.5–7 μm (MIT–083).

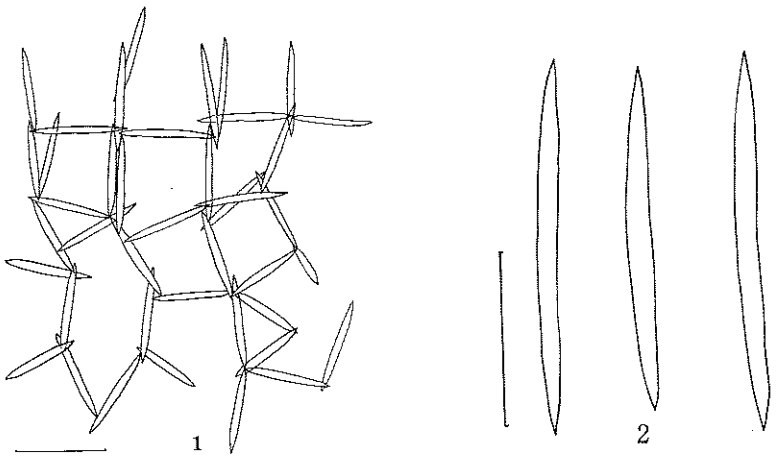


Fig. 19. *Haliclona (Reniclona) permollis* (Bowerbank). (MIT–083).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 100 μm.

Distribution: Cosmopolitan
In Japan — Very common throughout Japan.
Note: Dimensions and spicule measurements of representative specimens are as follows:

	Dimensions of specimen	Spicule measurements
		Oxeon
SIS–049	10×8×3 cm	115–122–130×7–7.5–8
SIS–119	10×8×2	95–112–120×6–7–8
SIS–127	7×7×6	76–89–100×5–5.6–6
MIT–083	3×5×1	80–95–104×3–5.5–7
JAP–021	12×9×5	113–131–140×6–8.4–10

Remarks: This species is well-known and widely distributed in Japan. Most people have a tendancy to identify any purple intertidal sponge to this species, which is often a mistake. In the Inland Sea of Japan, *Haliclona (Reniclona) pemollisimilis* n. sp. co-occur and have similar coloration to this species.

26. *Haliclona (Reniclona) permollisimilis* n. sp.

(Fig. 20; Pl. 2, Fig. 9)

Material examined: AR–1–57 (Holotype), AR–1–58, AR–1–65, Matsushima-Maeshima, 3–V–1972.
Dimensions: 3×2.5×1 cm, (AR–1–57).
Habitat: Intertidal zone, low tide subzone.
Shape: Irregular and thickly encrusting, or small, lobate and massive, less

than 1 cm thick.

Color: Pansy Purple 30NF.

Consistency: Soft, not very tough in life, and slightly compressible when dry.

Surface: Smooth, punctated, and uneven. Oscules are 0.5–3.0 mm in diameter and open over entire surface, 0.5–1.0 mm apart.

Ectosome: No dermal specialization.

Endosome: Partly loose, subisodictyal arrangement with some very vague tracts, irregularly and loosely composed of one to several rows of oxea, ascending as primary fibers. These tracts are irregularly connected with a single oxeon, several rows of oxea, or irregularly reticulated oxea.

Spicule: Oxeon only — Smooth, hastate, slightly bent at the middle or gently

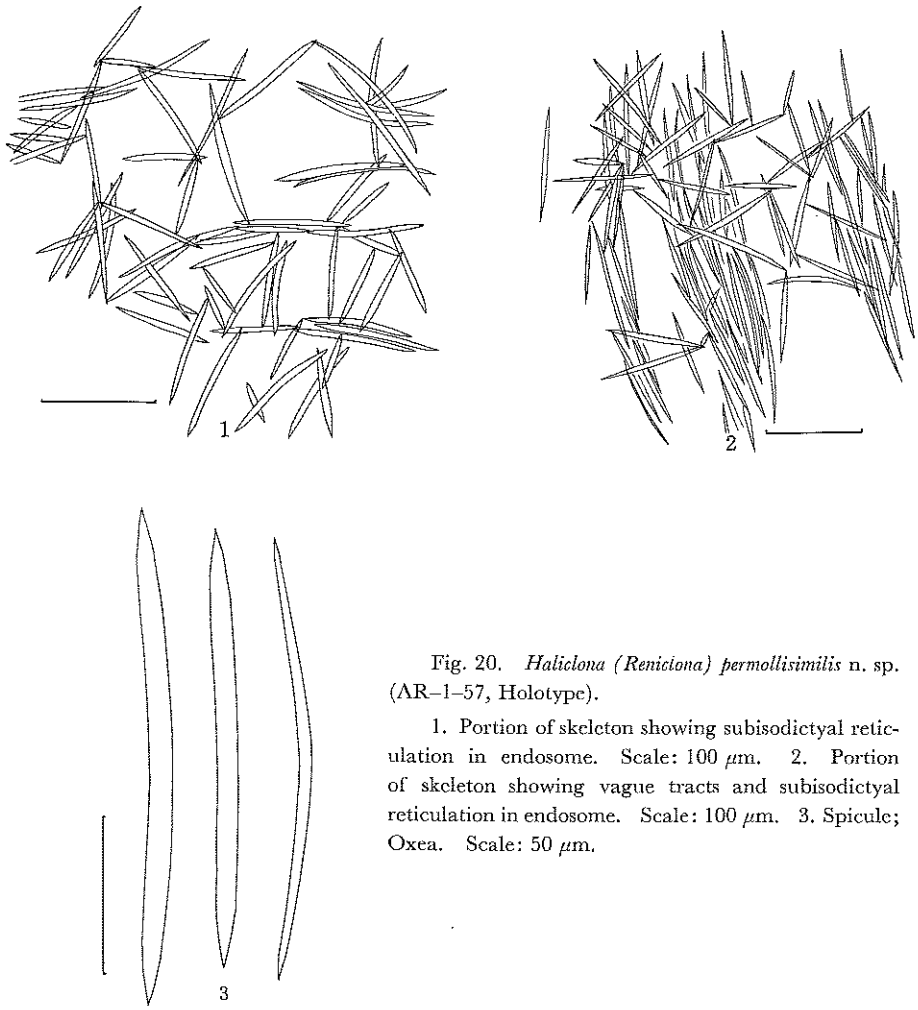


Fig. 20. *Haliclona (Reniciona) permollisimilis* n. sp. (AR–1–57, Holotype).

1. Portion of skeleton showing subisodictyal reticulation in endosome. Scale: 100 μm. 2. Portion of skeleton showing vague tracts and subisodictyal reticulation in endosome. Scale: 100 μm. 3. Spicule; Oxea. Scale: 50 μm.

curved with each end tapering to a point. Size range 110–165–180×5–6.8–8 μm (AR–1–57).

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
AR–1–57	3×2.5×1 (thickness) cm	110–165–180×5–6.8–8
AR–1–58	4×4×1 (〃)	150–164–180×5–6.3–7
AR–1–65	5×4×1 (〃)	140–149–160×4–7–9

Remarks: This species closely resembles *Haliclona (Reniclona) permolllis* (Bowerbank) in coloration, but is easily distinguished from the latter by its consistency, spicule dimensions and arrangement. This species also very common in the Inland Sea of Japan.

27. *Haliclona (Reniclona) punctata* n. sp.

(Fig. 21; Pl. 2, Fig. 10)

Material examined: AR–1–10 (Holotype), AR–1–12, AR–1–22, Ariake Sea (near Aitsu M.B.S.), 3–V–1972.

Dimensions: 2.5×3×2 cm, (AR–1–10).

Habitat: Subtidal zone, 20 m in depth, on carbonate bottom.

Shape: Irregular, hemispherical, spherical or massive with several lobes.

Color: Ecru 08ED or Light Brown Drab 18ED.

Consistency: Elastic and tough in life, remaining slightly elastic when dry.

Surface: Smooth, even, and punctated over entire surface. Oscules are

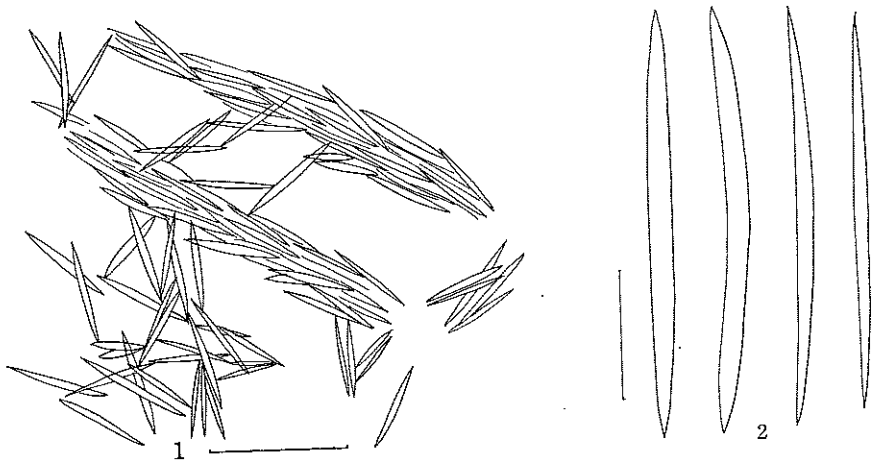


Fig. 21. *Haliclona (Reniclona) punctata* n. sp. (AR–1–10, Holotype).

1. Portion of skeleton in endosome near ectosome. Scale: 150 μm. 2. Spicule; Large oxea and small oxea. Scale: 50 μm.

about 7 mm in diameter and open at the summits of the lobes or the spherical body. Pores invisible.

Ectosome: No dermal specialization.

Endosome: Near surface with very vague tracts, 25–30 μm in diameter consisting of ten or more rows of spicules and ascending 50–300 μm apart. These primary tracts are connected with subisodictyal or irregular reticulations of spicules as the secondary tracts. In deep portion, the skeleton is exclusivcly subisodictyal or has irregular reticulation.

Spicule: Oxeon only, with two size modes.

Large oxeon — Smooth, hastate, and slightly arched or bent at the middle, with each end sharply pointed. Size range 143–148–155 × 7–8–9 μm (AR–1–10).

Small oxeon — Smooth, fusiform, straight to slightly bent at the middle, tapering to a point at each end. Size range 125–139–150 × 4–5–6 μm (AR–1–10).

Notc:

	Dimcnsions of spccimen	Spicule measurements
		Oxeon, two size modes
AR–1–10	2.5 × 3 × 2 cm	143–148–155 × 7–8–9, 125–139–150 × 4–5–6
AR–1–12	3 × 3.5 × 2.5	140–148–155 × 6–7–8, 120–137–150 × 3–4–5
AR–1–22	3 × 3 × 2.5	155–158–165 × 6–7–8, 115–126–135 × 4–4.5–5

Remarks: This species resembles *Haliclona (Reniclona) ellipsis* n. sp. in external form but differs in having two size modes of oxea. The surface appearance of this species is similar to *Haliclona (Reniclona) lentus* n. sp., but differs in forming primary tracts.

28. *Haliclona (Reniclona) robustaspicula* n. sp.

(Fig. 22; Pl. 2, Fig. 11)

Material examined: SAT–007–F (Holotype), SAT–042–1, Uchinoura, 5–XI–1975.

Dinensions: 3 × 3 × up to 1 (height) cm, (SAT–007–F).

Habitat: Subtidal zone.

Shape: Thin encrusting, on surfaces of basal or distal parts of other sponges.

Color: Pale Cinnamon Pink 10BB when dry.

Consistency: Incompressible or slightly compresssible, fragile.

Surface: Smooth, even or uneven, or undulated. Oscules of up to 1 mm in diameter are found loosely spaced over thc entire surface. Pores invisible.

Ectosome: No dermal specialization.

Endosome: Irregular isodictyal reticulation, with occasionally irregular reticulation of vaguc di- or trispicular tracts.

Spicule: Oxeon only — Hastate, smooth, gently curved or arched by bending twice at one third spicule length from each end and tapering to pointed ends.

Size range 265–282–295 × 11–12–13 μm (SAT–007–F).

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
SAT–007–F	3 × 3 × up to 1 (height) cm	265–282–295 × 11–12–13
SAT–042–1	10 × 6 × 1	230–289–325 × 8–12–13

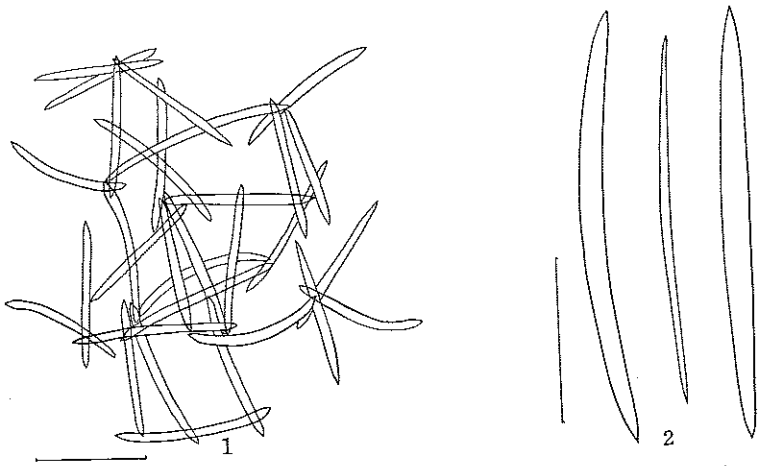


Fig. 22. *Haliclona (Reniclona) robustaspicula* n. sp. (SAT–007–F, Holotype).
1. Portion of skeleton in endosome. Scale: 200 μm. 2. Spicule; Oxea. Scale: 100 μm.

Remarks: This species is characteized by having stout spicules, and resembles *Haliclona (Reniclona) densaspicula* n. sp. in having larger spicules than those of any other species of the subgenus *Reniclona*, but differs from the latter in having larger spicules and in having no free spicules in the flesh.

29. *Haliclona (Reniclona) sataensis* n. sp.

(Fig. 23; Pl. 3, Fig. 1)

Material examined: MIT–028–B (Holotype), Mitsukue, 5–XI–1975; SAT–068–1, Uchinoura, 5–XI–1975; AR–1–51, Ariake Sea (near Aitsu M.B.S.), 3–V–1972.

Dimensions: 3 × 1 × 2 cm, (MIT–028–B).

Habitat: Subtidal zone.

Shape: Irregular thin, up to 2 cm thick, encrusting on surfaces of other sponges.

Color: Old Rose 27LC.

Consistency: Hard, incompressible or fragile.

Surface: Smooth to touch, almost even. Oscules and pores invisible.

Ectosome: No dermal specialization.

Endosome: Isodictyal reticulation, or with occasional irregular reticulation of vague tracts.

Spicule: Oxeon only — Hastate, smooth, nearly straight, with each end sharply pointed. Size range 140–150–155 × 6–6.5–7 μm (MIT–028–B).

Note:

	Dimensions of specimen	Spicule measurements	Color
		Oxeon	
MIT–028–B	3 × 1 × 2 cm	140–150–155 × 6–6.5–7	Old Rose
SAT–068–1	5 × 5 × less than 1	145–152–160 × 7–8–10	Old Rose
AR–1–51	6 × 4 × less than 1.5	115–155 × 7–8	Deep Violet Plumbeous

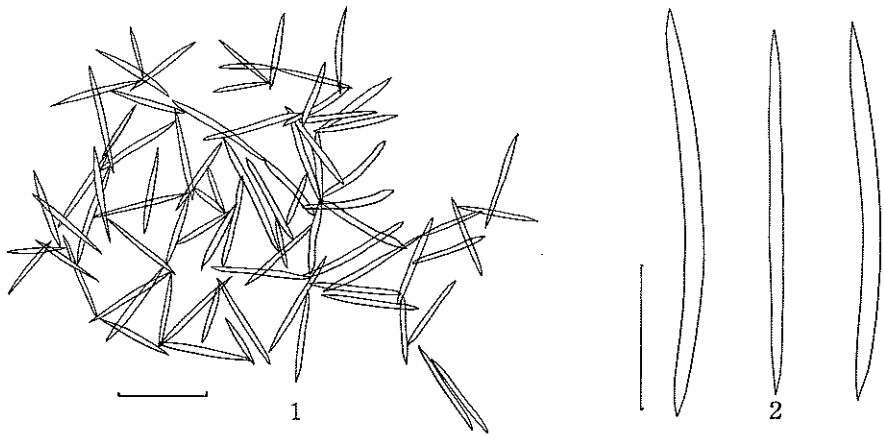


Fig. 23. *Haliclona (Reniclona) sataensis* n. sp. (MIT–028–B, Holotype).
1. Portion of skeleton in endosome. Scale: 150 μm. 2. Spicule; Oxea. Scale: 50 μm.

Remarks: This species differs from any other species of the subgenus *Reniclona* in spicule measurement and coloration. The writer assigned AR–1–51 to this species with some hestation, as it is different from the Holotype in coloration.

30. *Haliclona (Reniclona) tachibanaensis* n. sp.

(Fig. 24; Pl. 3, Fig. 2)

Material examined: SIS–063, Mukaishima, 28–II–1970; SIS–126 (Holotype), Mukaishima, 26–V–75.

Dimensions: 8 × 6 × 1.5 (thickness) cm, (SIS–126)

Habitat: Intertidal or subtidal zone.

Shape: Irregular, thickness less than 1.5 cm, encrusting, with several swellings.

Color: Warm Gray d or Ecru 08ED.

Consistency: Slightly compressible, not tough.

Surface: Smooth to touch, minutely hispid, uneven. Oscules are 2–2.5 mm across, open on the surface, 0.8–1.0 cm apart, with a low, less than 1 mm high, collar, and occasionally oscules invisible. Pores invisible.

Ectosome: No dermal specialization.

Endosome: Reticulation of primary tracts and subisodictyal networks. Primary tracts are di- or trispicular, 15 μm in diameter, and ascend 50–120 μm apart. These primary tracts are connected with subisodictyal reticulation as the secondary. No tracts are formed in the deep portion of the sponge.

Spicule: Oxeon only — Fusiform to hastate, smooth, straight to weakly bent at the middle, and tapering to a sharp point at each end. Size range 100–111–125×2–4–6 μm (SIS–126).

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
SIS–063	Fragment, 2×2×1 cm	100–109–120×2–4.5–6
SIS–126	8×6×1.5 cm	100–111–125×2–4–6

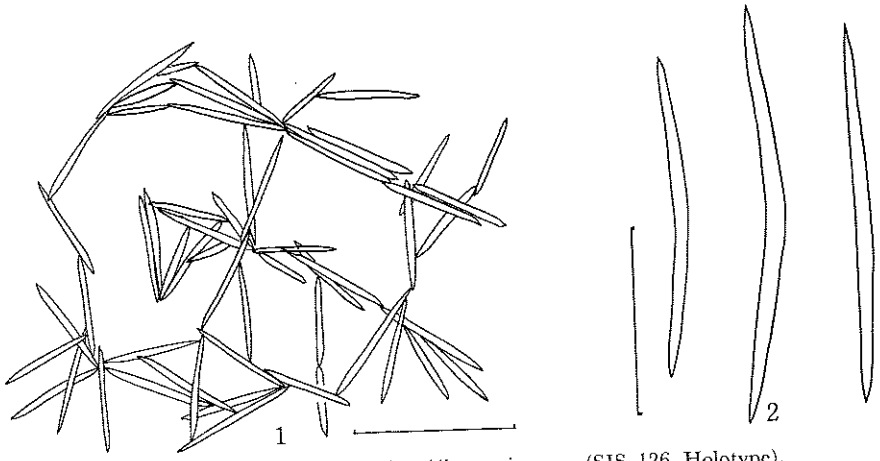


Fig. 24. *Haliclona (Reniclona) tachibanaensis* n. sp. (SIS–126, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

Remarks: This species closely resembles *Haliclona (Reniclona) tenuis* n. sp. in spicule arrangement, but clearly differs in spicule measurement and spicule morphology.

31. *Haliclona (Reniclona) tenuis* n. sp.

(Fig. 25; Pl. 3, Fig. 3)

Material examined: SIS–090–3–b (Holotype), SIS–090–3–c, Sasajima, 21–I–1976; SIS–151, Sasajima, 21–I–1976; JAP–020, Usa, 12–VI–1976.

Dimensions: Less than 1 mm thick, small (SIS–090–3–b).

Habitat: Intertidal zone.

Shape: Very thin encrusting, 1–2 mm thick, on almost the entire surface of chitinous polychaete tube, or irregular, thin, encrusting, with numerous low branches.

Color: Pale Cinnamon 08GB or Indian Lake 29MC.

Consistency: Slightly compressible, not tough.

Surface: Smooth to touch, very minutely hispid, uneven. Oscules are 0.5–1.5 mm across and scattered on the entire surface, or form lines on the backs of repenting branches. Pores microscopic.

Ectosome: No dermal specialization.

Endosome: Di- or trispicular primary tracts ascend to the surface, 60–90 μm apart, and terminate as surface projections 40–60 μm in height. These primary tracts are connected with isodictyal reticulation, as the secondary fibers. In the deep portion of the sponge subisodictyal reticulation occurs without spiculofibrous structure.

Spicule: Oxeon only — Fusiform, smooth, straight to gently curved, or slightly bent at the middle with each end sharply pointed. Size range 83–94–100 × 5–6.5–8 μm (SIS–090–3–b).

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
SIS–090–3–b	0.3–0.7 mm thick	83–94–100 × 5–6.5–8
SIS–090–3–c	0.3–0.7 mm thick	84–93–100 × 5–6–7
SIS–151	less than 2 mm thick	80–90–98 × 2–4.3–6
JAP–020	5.5 × 3 × 1.5 cm	78–88–95 × 4–6.5–7

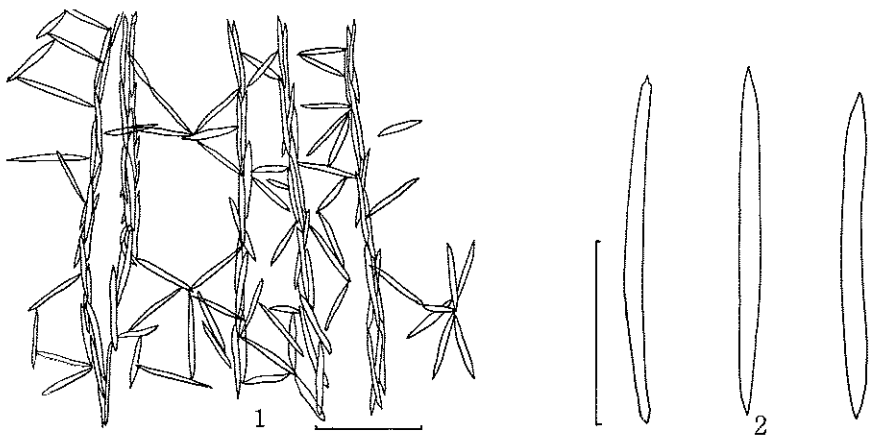


Fig. 25. *Haliclona (Reniclona) tenuis* n. sp. (SIS–090–3–b, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

Remarks: This species closely resembles *Haliclona (Reniclona) tachibanaensis* n. sp. in spicule arrangement, but differs in spicule measurement and spicule morphology.

32. *Haliclona (Reniclona) tuberosa* (Dendy, 1921)

Reniera tuberosa Dendy, 1921a, p. 33, Pl. 3, fig. 2, Pl. 12, fig. 2.
Haliclona (Reniclona) tuberosa: De Laubenfels, 1954a, p. 66.
Haliclona tuberosa: Tanita, 1961d, p. 338.

Distribution: Saya de Malha; Indian Ocean.
In Japan — Inland Sea of Japan.
Remarks: This species was placed in the subgenus *Reniclona* by De Laubenfels (1954a) and in Japan was reported by Tanita (1961d) as having oxea measuring 130–180 × 5–8 μm.

33. *Haliclona (Reniclona) viloa* n. sp.

(Fig. 26; Pl. 3, Fig. 4)

Material examined: AR–1–38 (Holotype), AR–1–39, AR–1–40, AR–1–41, Matsushima Maeshima, 3–V–1972.
Dimensions: 4 × 4.5 × 0.7 cm (AR–1–38).
Habitat: Intertidal zone, low tide subzone, on shaded rock surfaces.
Shape: Thin, 0.7–2.0 cm thick, encrusting on rock surfaces.

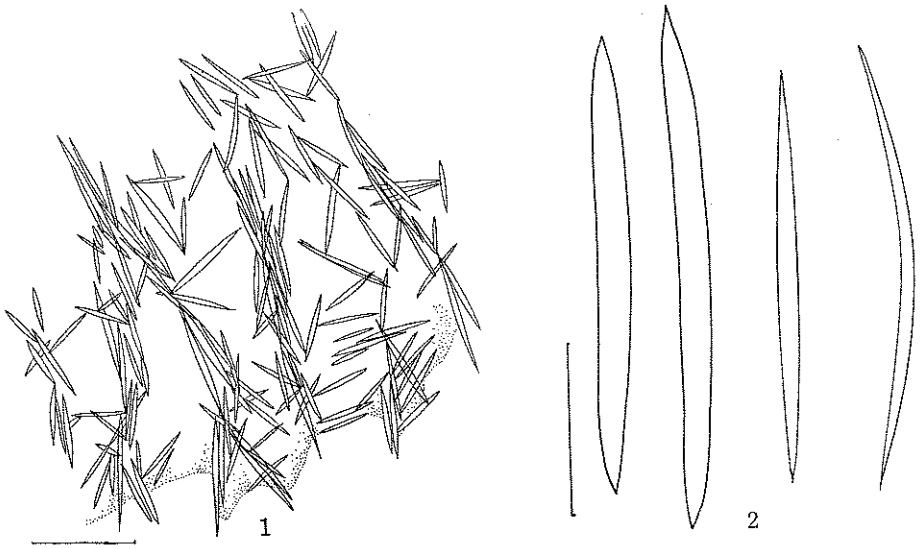


Fig. 26. *Haliclona (Reniclona) viola* n. sp. (AR–1–38, Holotype).
1. Portion of skeleton in endosome beneath ectosome. Ectosome: Below. Scale: 100 μm. 2. Spicule; Large Oxea and small oxea. Scale: 50 μm.

Color: Deep Violet Plumbeus 50HE.

Consistency: Soft to touch.

Surface: Smooth, uneven. Oscules are 2–3 mm in diameter and are scattered over the entire surface at regular intervals with 0.7–1.0 cm between each. The environs of oscules are slightly swollen, 1–2 mm higher than surrounding area. Pores invisible.

Ectosome: No dermal specialization.

Endosome: Vague tracts of 10–30 μm in diameter, consisting of two to seventeen rows of oxea, ascending from substratum to surface, 50–100 μm apart. These tracts are the primary fibers and are connected with irregular, reticulated oxea.

Spicule: Oxeon only, with two size modes.

Large oxeon — Smooth, hastate, straight or slightly bent at the middle and sharply pointed at each end. Size range 120–130–155 × 5–7–8 μm (AR–1–38).

Small oxeon — Thin, smooth, fusiform, gently curved, tapering to a point at each end. Size range 100–123–145 × 1–3–5 μm (AR–1–38).

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
AR–1–38	4 × 4.5 × 0.7 cm	120–130–155 × 5–7–8, 100–123–145 × 1–3–5
AR–1–39	5 × 6 × 0.7	135–145–150 × 7–7.7–8, 100–116–120 × 1–3–4
AR–1–40	8 × 5 × 1	120–145–160 × 7–8–9, 110–121–130 × 2–3–4
AR–1–41	10 × 9 × 1	142–146–155 × 5–8–9, 110–120–130 × 2–3–5

Remarks: This species resembles *Haliclona (Reniclona) sataensis* n. sp. in external form and coloration, but differs in spiculation.

Subgenus *Reniera* Schmidt, 1862

34. *Haliclona (Reniera) aquaeductus* (Suhmidt, 1862)

(Fig. 27)

Reniera aquaeductus Schmidt, 1862, p. 73, Pl. 7, fig. 6; Koltun, 1959, p. 215, Pl. 38, fig. 2, t-fig. 174.

Haliclona aquaeductus: Burton, 1934a, p. 7; 1935a, p. 66; Koltun, 1962b, p. 186; Tanita, 1968, p. 41; 1970b, p. 100, Pl. 1, fig. 1; Hoshino, 1971, p. 24; 1975c, p. 17.

Material examined: MIT–034, Mitsukue, 5–XI–1975.

Dimensions: 4 × 4 × 1 (thickness) cm.

Habitat: Subtidal zone, on the holdfasts of the brown alga *Ecklonia*.

Shape: Irregular massive, becoming entangled in the roots of holdfasts.

Color: Maple 07GD when dry.

Consistency: Unknown, but incompressible when dry.

Surface: Smooth to touch, even, but slightly wrinkled. Oscules 1–3 mm across are found at the surface.

Ectosome: No dermal specialization, surface littered with sand granules, detritus, and so forth.

Endosome: Haliclonid reticulation with vague tracts of three to five rows of oxea each as primary fibers, and with unispicular tracts or single spicules, as the secondary fibers, connecting the primary fibers.

Spicule: Oxeon only — Hastate, smooth, straight or slightly curved, slightly tapering to each end becoming abruptly pointed. Size range 135–155–165 × 5–7.5–9 μm. In addition to these spicule sizes, juveniles of a smaller size are present in abundance.

Distribution: Cosmopolitan

In Japan — Sea of Japan: Inland Sea of Japan; Yuki.

Remarks: This species is closely related to *Haliclona (Reniera) implexa* (Schmidt), but differs in spicule size.

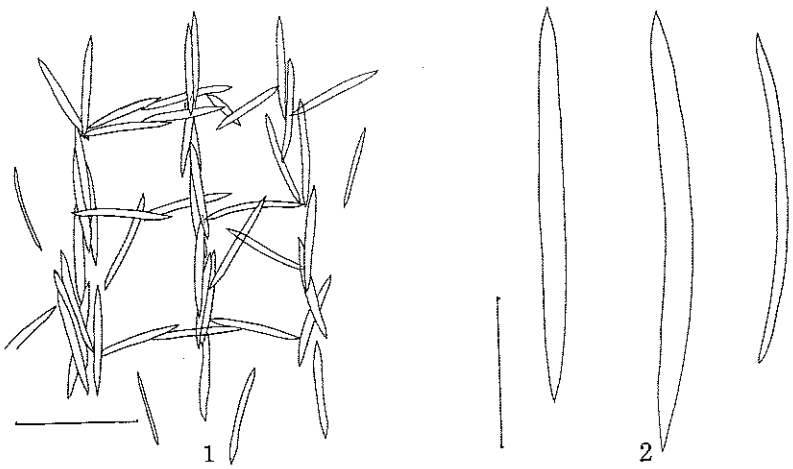


Fig. 27. *Haliclona (Reniera) aquaeductus* (Schmidt). (MIT–034).
1. Portion of skeleton in endosome. Scale: 150 μm. 2. Spicule; Oxea. Scale: 50 μm.

35. *Haliclona (Reniera) enormismacula* n. sp.

(Fig. 28; Pl. 3, Fig. 5)

Material examined: SIS–003 (Holotype), Hosonosu, 10–VIII–1971; SIS–028, off Yokoshima, 25–II–1970; SIS–148, Mukaishima, 9–VII–1975.

Dimensions: 5 × 0.7 × 6 (height) cm, (SIS–003).

Habitat: Intertidal zone.

Shape: Irregular ramose, composed of several compressed branches, ramified in places, or occasionally encrusting irregularly and thinly on the surfaces of leaves or stalks of the brown alga, *Sargassum*.

Color: Orange Rufous 13NF or Pale Burnt Lake 28PF.

Consistency: Compressible, tough.

Surface: Smooth to touch, very minutely hispid, and even. Oscules are 1–2 mm across and aligned at the edges of compressed branches, at intervals of 0.5–1.0 cm. Pores invisible.

Ectosome: No dermal specialization.

Endosome: Irregular or polygonal reticulation of primary and secondary tracts of oxea. Primary tracts, 30–40 μm in diameter, are well developed near the surface, composed of ten or more rows of oxea, run from the inner part to the surface, 100–200 μm apart, and terminate in a protrusive bundle at the surface. Secondary tracts are composed of several rows of oxea, 20–30 μm in diameter, and connect the primary tracts as a lottery.

Spicule: Oxeon only — Hastate, smooth, straight or slightly arched, nearly constant in width throughout the entire length, with each end tapering to a point. Size range 140–148–155 × 8–9.5–11 μm and in juvenile 110–120–130 × 3–3.5–4 μm (SIS–003).

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
SIS–003	5 × 0.7 × 6 (height) cm	140–148–155 × 8–9.5–11, 110–120–130 × 3–3.5–4 (Juvenile)
SIS–028	3 × 3 × 11 (〃)	140–148–152 × 10–11–12
SIS–148	thin encrusting	155–167–185 × 5–9–12

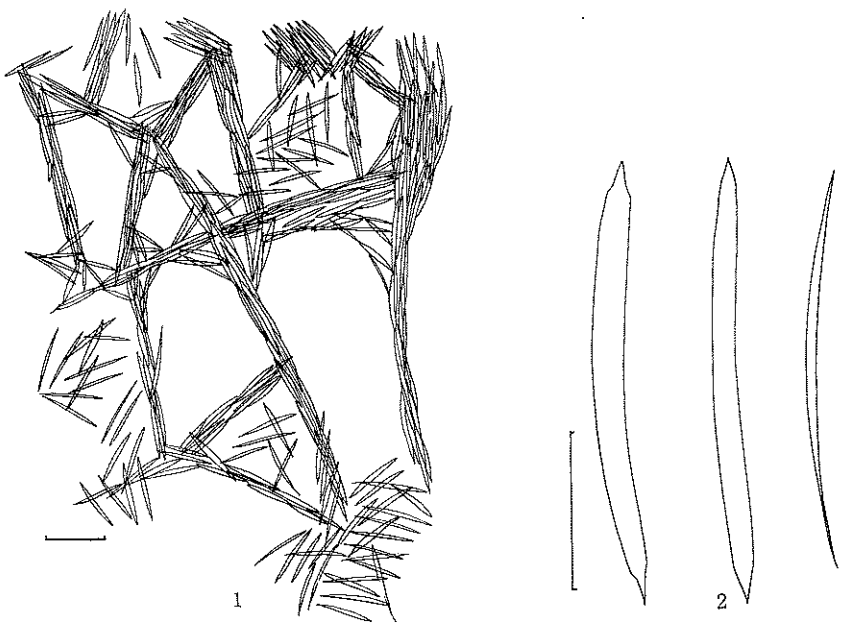


Fig. 28. *Haliclona (Reniera) enormismacula* n. sp. (SIS-003, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

Remarks: This species is characterized by irregular, polygonal meshes of reticulation and is clearly distinguished from any other related species in this regard.

36. *Haliclona (Reniera) frondosa* n. sp.

(Fig. 29; Pl. 3, Fig. 6)

Material examined: JAP–027 (Holotype), Kurotsusaki (Ooita Pref.), 5–XI–1977.

Dimensions: $14 \times 8 \times 3$ cm.

Habitat: Intertidal or subtidal zone.

Shape: Amorphous mass composed of irregular, anastomosing branches, 0.5–1.0 cm in diameter.

Color: Maple 07GD or Khaki 08LD when dry.

Consistency: Compressible and fairly tough.

Surface: Minutely hispid. Oscules, 1–2 mm across, are aligned on the back surfaces of branches, at intervals of 0.7–1.0 cm. Pores invisible.

Ectosome: No dermal specialization.

Endosome: Reticulation of primary and secondary tracts. Primary tracts are densely packed with oxea, 20–50 μm in diameter, and ascend to surface 100–250 μm apart, terminating as protrusions at the surface. Secondary tracts, consisting of several rows of oxea, connect between the primary tracts, at almost right angles, and at intervals of 100–250 μm as a lottery. Thin oxea exist freely in the endosome.

Spicule: Oxeon only, with two size modes.

Thick oxeon — Thick, smooth, hastate, slightly arched, and sharply pointed at

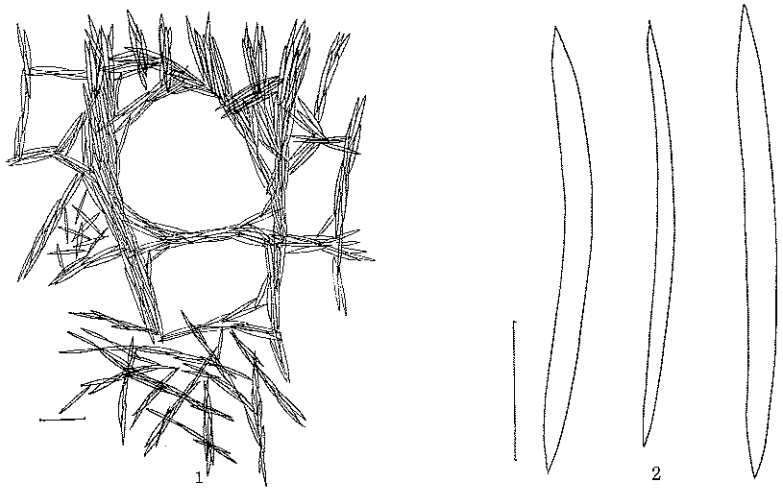


Fig. 29. *Haliclona (Reniera) frondosa* n. sp. (JAP–027, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

each end. Size range 165–168–178 × 10–11–13 μm.

Thin oxeon — Thin smooth, fusiform, slightly bent at the middle, and sharply pointed at each end. Size range 118–140–165 × 3–5–7 μm.

Remarks: This species exhibits typical renieroid skeletal structure and is characterized by having two types of spicules, both in size and form.

37. *Haliclona (Reniera) palmata* (Ellis et Sollander, 1786)

Spongia palmata Ellis et Sollander, 1786, p. 189.

Haliclona palmata: Burton, 1930, p. 511; Dickinson, 1945, p. 7, Pl. 6, figs. 11–12, Pl. 7, fig. 13; Hoshino, 1975b, p. 14, Pl. 1, figs. 1–3.

Distribution: Cosmopolitan.

In Japan — Kurahashijima.

Remarks: In Japan, this species was first recorded from Kurahashijima (Inland Sea of Japan) by Hoshino (1975b). The skeleton of this species conforms to those of the subgenus *Reniera*.

38. *Haliclona (Reniera) implexa* (Schmidt, 1868)

(Fig. 30)

Reniera implexa Schmidt, 1868, p. 27; Ridley et Dendy, 1887, p. 15, Pl. 1, fig. 4.

Haliclona implexa: Koltun, 1962b, p. 186; Tanita, 1970b, p. 100, Pl. 1, fig. 2; Hoshino, 1975a, p. 31.

Material examined: MIT–035, Mitsukue, 5–XI–1975.

Dimensions: 1 × 1 × 3 (height) cm.

Habitat: Subtidal zone, on the holdfasts of the brown alga, *Ecklonia*.

Shape: Single, upright, hollw cylinder, growing from a base caught in several roots of holdfasts.

Color: Maple 07GD when dry.

Consistency: Unknown, but incompressible when dry.

Surface: Smooth to touch. A single oscule opens at the top of the cylindrical sponge.

Ectosome: No dermal specialization.

Endosome: Haliclonid reticulation by vague tracts composed of one to three rows of oxea as primary fibers, and single spicules or unispicular tracts, as the secondary fibers, connecting the primaries.

Spicule: Oxeon only — Hastate, smooth, straight or slightly curved, tapering from the center to a point at each end. Size range 110–116–130 × 4–5–7 μm.

Distribution: Cosmopolitan.

In Japan — Yuki; Hiwasa.

Remarks: This species is characterized by its hollow, cylindrical form. The specimen in this study agrees with the spicule measurement given by Tanita (1970b) for specimens from Tokushima.

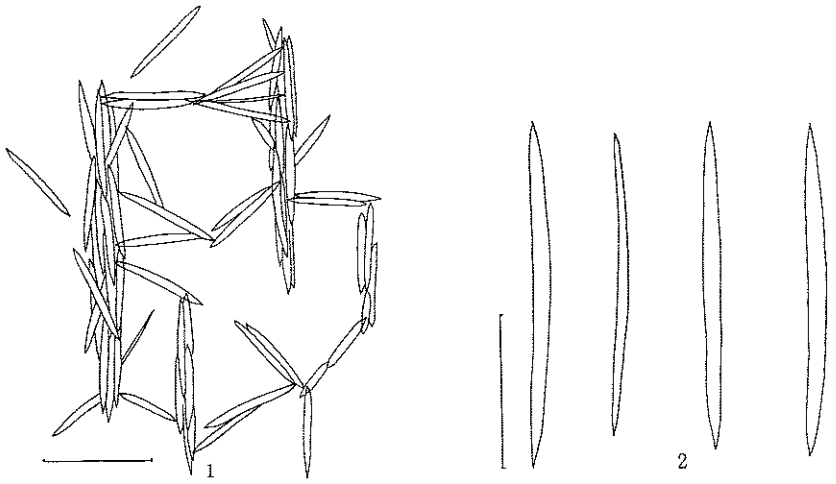


Fig. 30. *Haliclona (Reniera) implexa* (Schmidt).(MIT–035).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

39. *Haliclona (Reniera) surrufa* n. sp.

(Fig. 31; Pl. 3, Fig. 7)

Material examined: SIS–016, Mukaishima, 10–VIII–1975; SIS–108, Sasajima, 21–I–1976; SIS–115, SIS–124, SIS–137, Sasajima, 11–VI–1975; SIS–143 (Holotype), Sasajima, 21–I–1976.

Dimensions: 6×6×15 (height) cm, (SIS–143).

Habitat: Subtidal zone, clinging to stalks of the brown alga, *Sargassum*.

Shape: Irregular massive, irregular lobate, or thin encrusting, with a few upright lobate branches 0.3–0.5 cm across and 1.5–2.0 cm in height. Branches slightly compressed.

Color: Red Orange 22OA, Carmine Red 30PC, English Red 17LC, or Orange 16PA.

Consistency: Soft, compressible, tough or not so tough.

Surface: Minutely hispid, but partly smooth. Oscules 1–3 mm across are scattered 1–3 cm apart over the entire surface. Pores microscopic.

Ectosome: No dermal specialization.

Endosome: Reticulation of primary and secondary tracts. Primary tracts are 25–30 μm in diameter and composed of densely packed oxea, ascending 150–200 μm apart, from inner part to surface, and terminating in a projection at the surface. Secondary tracts, 15–20 μm in diameter, irregularly connect the primary tracts at intervals of 200–300 μm, as a lottery. Numerous free oxea are scattered in the flesh.

Spicule: Oxeon only — Hastate, smooth, thin or slightly thick, straight or slightly arched with both ends sharply pointed. Size range 130–158–205× 2–5–6 μm (SIS–143).

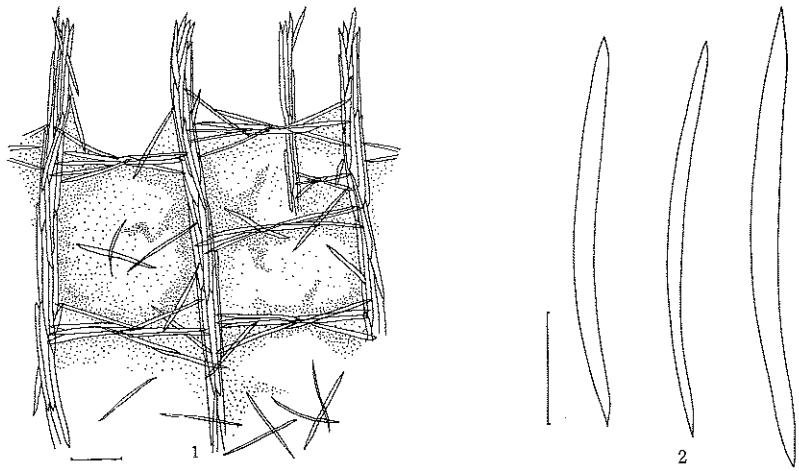


Fig. 31. *Haliclona (Reniera) surrufa* n. sp. (SIS-143, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
SIS-016	2×3×5 (height) cm	165–181–195×7–8.6–10
SIS-108	7×6×5 (〃)	180–188–200×6–8.5–10
SIS-115	5×3×4 (〃)	145–177–220×5–8–12
SIS-124	6×3×2.5 (〃)	155–170–180×5–7–9
SIS-137	4×2×0.5 (thickness)	140–160–170×4–5.6–7
SIS-143	6×6×15 (height)	130–158–205×2–5–6

Remarks: This species is characterized by its coloration, and differs from any other related species in this regard.

Subgenus *Amphimedon* Duchassing et Michelotti, 1864

40. *Haliclona (Amphimedon) aitsuensis* n. sp.

(Fig. 32; Pl. 4, Fig. 1)

Material examined: AR-1-61 (Holotype), Matsushima Maeshima, 3-V-1972.

Dimensions: 5×3×4 cm.

Habitat: Intertidal zone, low tide subzone.

Shape: Irregular, massive sponge, consisting of densely packed thin cylindrical branches. The centers of the cylinders are occupied by chitinous annelid tubes. This sponge sppears to be essentially very thin encrusting, less than

1 mm thick, on the chitinous tubes.

Color: Gray.

Consistency: Elastic, not very tough.

Surface: Smooth, uneven, minutely hispid, with protrusions less than 0.5 mm in height and less than 0.4 mm apart. Oscules and pores invisible.

Ectosome: No dermal specialization.

Endosome: Irregular reticulation of extremaly vague tracts with a loose and confused arrangement of oxea.

Spicule: Oxeon only, with two size modes.

Thick oxeon — Smooth, hastate, straight to slightly bent at the middle, with each end sharply pointed. Size range 132–141–148 × 7–8–9 μm.

Thin oxeon — Smooth, fusiform, slightly bent at the middle, tapering to a sharp point at each end. Size range 115–126–135 × 4–5–6 μm.

Spicules with abberations are found at the middle.

Remarks: This species, which belongs to the subgenus *Amphimedon*, is characterized by having an irregular, reticulated endosome skeleton.

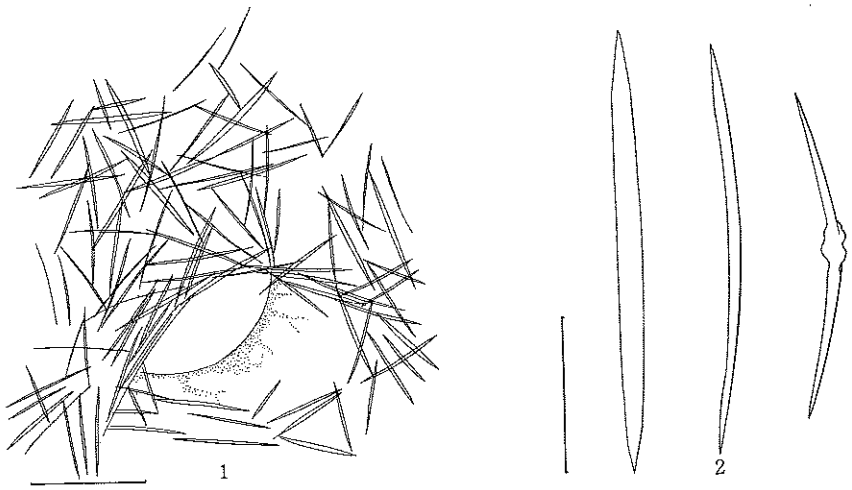


Fig. 32. *Haliclona (Amphimedon) aitsuensis* n. sp. (AR–1–61, Holotype).
1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Oxea. Scale: 50 μm.

Family Callyspongiidae De Laubenfels, 1936

Genus *Callyspongia* Duchassaing et Michelotti, 1864

41. *Callyspongia bispicula* Tanita, 1961

Callyspongia bispicula Tanita, 1961d, p. 341, Pl. 2, figs. 6–7; Hoshino, 1971, p. 25.

Distribution: In Japan — Inland Sea of Japan.

42. *Callyspongia elegans* (Thiele, 1899)

Spinosella elegans Thiele, 1899, p. 23, Pl. 3, fig. 2, Pl. 5, fig. 19.
Callyspongia elegans: Tanita, 1965a, p. 46, Pl. 1, fig. 2; 1970b, p. 101, Pl. 1, fig. 4; 1977, p. 33; Kim *et al*, 1968, p. 38, Pl. 1, fig. 2, t-fig. 3; Rho *et al*, 1969, p. 154.

Distribution: Celebes; Korea Strait.
In Japan — Aikawa; Yuki; Shirahama.

43. *Callyspongia elongata* (Ridley et Dendy, 1886)

Pachychalina elongata Ridley et Dendy, 1886, p. 329; 1887, p. 23, Pl. 5, fig. 1.
Cladochalina elongata: Burton, 1927, p. 510.
Callyspongia elongata: Tanita, 1961d, p. 339, Pl. 1, fig. 3; 1964, p. 17, pl. 1, fig. 3; 1967, p. 114; 1968, p. 42; 1969, p. 73; Rho *et al*, 1969, p. 155, Pl. 1, fig. 1; Hoshino, 1971, p. 25.

Distribution: Bass Strait; Korea Strait.
In Japan — Inland Sea of Japan; Tsukumo Bay; Sado.

44. *Callyspongia conforderata* (Ridley, 1884)

Tuba confoederata Ridley, 1884, p. 400.
Siphonella laxa Lendenfeld, 1887, p. 803, Pl. 24, fig. 55.
Siphonella confoederata: Lendenfeld, 1887, p. 803, Pl. 25, fig. 60.
Siphonella typica Lendenfeld, 1887, p. 804, Pl. 24, fig. 54, Pl. 27, figs. 2 and 19.
Siphonella elastica Lendenfeld, 1887, p. 805.
Siphonella pausispina Lendenfeld, 1887, p. 805.
Siphonella axialis Lendenfeld, 1887, p. 805, Pl. 24, fig. 53.
Siphonella tuberculata Lendenfeld, 1887, p. 808.
Siphonella extensa var. *dura* Lendenfeld, 1887, p. 806.
Callyspongia confoederata: Tanita, 1961b, p. 133, Pl. 3, fig. 3, t-fig. 2; 1967, p. 113; 1969, p. 72; 1970b, p. 101, Pl. 1, fig. 3; 1977, p. 32; Hoshino, 1970, p. 23, figs. 3–5; 1971, p. 25; 1975c, p. 18, Pl. 1, fig. 4; 1975a, p. 32, Pl. 4, fig. 11, 1976a, p. 248, Pl. 1, fig. 1; 1976c, p. 5, figs. 1 and 8.

Material examined: SIS–014, Hosonosu, 10–VIII–1975; SIS–023, Shijushima. 10–VIII–1976; SIS–132, Shijushima, 24–V–1975; MIT–001, MIT–010, MIT–011, MIT–051, MIT–052, Mitsukue, 5–XI–1975; MIT–081–1, Shionashi, 5–XI–1975; MIT–107, Mitsukue, 4–XI–1973; SAT–001, SAT–035, SAT–067, Uchinoura, 5–XI–1975; AR–1–24, Ariake Sea (near Aitsu M.B.S.), 15–V–1972.

Dimensions: 28 cm high, 24 cm wide, 9 cm thick, (MIT–001)

Habitat: Low tide subzone or subtidal zone. Abundant to a depth of 20 m.

Shape: Generally, this sponge is composed of several hollow cylindrical tubes originating from a single short trunk. The cylindrical tubes are of equal wide throughout their length, or slightly expand from the basal portion upward.

Color: Vernonia Purple 30NF, Peach Red 20LA, or Laelia Pink 33ED. This species shows bimorphism in coloration, with purple and orange red specimens.

Consistency: Tough, spongy.

Surface: Outer surface — With many conules, 2–3 mm in height, 1–2 mm across, and 1–3 mm apart, but is flat and void of conules near the trunk. Inner surface — No conules, smooth, or slightly conulose. Pores and oscules are invisible on all surfaces.

Ectosome (Outer surface): Formed by irregular, triangular network of thick (100–120 μm) spiculo-fibers and triangular or polygonal networks of less thick (20–30 μm) spiculo-fibers between the triangular networks.

Ectosome (Inner surface): Formed by irregular, triangular, or polygonal networks of thin (10–30 μm) spiculo-fibers, and is apparently void of such thick speculo-fibers as in the outer surface skeleton.

Endosome: Complicated triangular or polygonal networks of very thick (200–300 μm) spiculo-fibers running to a conule tip, thick primary spiculo-fibers and thin (20–30 μm) spiculo-fibers irregularly connecting the thick spiculo-fibers.

Spicule: Oxeon only — Smooth, stright or slightly arched, fusiform, tapering to each pointed end. Size range 80–90–100 × 2–2.3–4 μm (MIT–001).

Distribution: Cosmopolitan.

In Japan — Sea of Japan; Inland Sea of Japan; Pacific Coast; Ariake Sea.

Note: Dimensions and spicule measurements of representative specimens are as follows:

	Dimensions of specimen	Spicule measurements
		Oxeon
SIS–014	14 × 10 × 12 cm	80–84–90 × 2–3–3
MIT–001	24 × 9 × 28 cm	80–90–100 × 2–2.3–4
MIT–051	6 × 5 × 17 cm	85–91–100 × 1–2.5–4
SAT–001	15 × 5 × 7 cm	80–89–95 × 3–4–4
AR–1–24	3 × 4 × 16 cm	90–95–100 × 4–6–8

Remarks: This pecies is one of the most common sponges in the shallow waters of Japan, and is characteristic in its external form.

45. *Callyspongia ecklonia* n. sp.

(Fig. 33; Pl. 4, Fig. 2)

Material examined: MIT–032 (Holotype) MIT–033, MIT–043, Mitsukue, 5–XI–1975.

Dimensions: Branches, 0.5–1 cm in diameter, spreading over an area 10 × 12 cm (MIT–032).

Habitat: Subtidal zone, attached on holdfasts of the brown alga, *Ecklonia*.

Shape: Slender, solid branches, irregular and anastomosing under or between the roots of *Ecklonia*.

Color: Pansy Purple 30NF.

Consistency: Slightly compressible.

Surface: Smooth to touch. Pores invisible. Oscules 0.5–2 mm in diameter, with very low collar arranged mainly on the under surface of branches, and occasionally on the upper surface, with 0.5–1 cm between each.

Ectosome: Well developed, with intergrading double networks of spongin spiculo-fibers. Networks of coarse fibers are triangular or rectangular, 200–300 μm in maximum length. The fibers are 20–30 μm in diameter and contain two to three rows of spicules in the central portion of the fibers. The coarse meshes grade into a network of slender fibers, 50–80 μm in maximum length. These fibers are unispicularly cored and are 5–15 μm in diameter.

Endosome: Regular reticulation of primary and secondary fibers near the surface. Primary fibers, 20–30 μm in diameter, are cored with several to ten or more rows of oxea, running outward, 250–350 μm apart. Secondary fibers are cored with two to six rows of oxea, connecting primary fibers at intervals of 200–300 μm, as a lottery. In either the central portion of the body or other portions of the sponge, the primary and secondary fibers are indistinguishable.

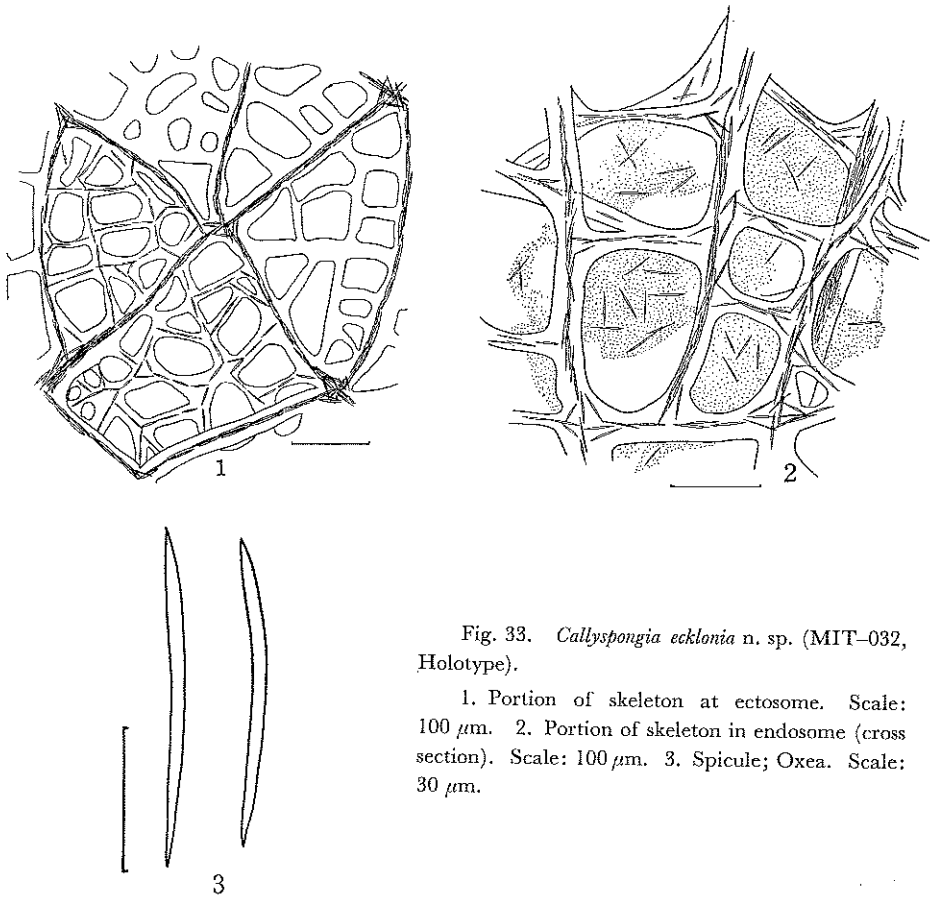


Fig. 33. *Callyspongia ecklonia* n. sp. (MIT–032, Holotype).

1. Portion of skeleton at ectosome. Scale: 100 μm. 2. Portion of skeleton in endosome (cross section). Scale: 100 μm. 3. Spicule; Oxea. Scale: 30 μm.

Spicule: Oxeon only — slightly arched and sharply pointed at each end. Size range 60–66–70 × 2–2.6–3 μm (MIT–032).

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
MIT–032	Branchy, 0.5–1 cm in diameter of branch, spread 10 × 12 cm	60–66–70 × 2–2.6–3
MIT–033	Branchy, about 1 cm in diameter of branch, spread 4 × 7 cm	60–64–7 × 2–3.9–4
MIT–043	Branchy mass, 6 × 6 × 2.5 cm	65–79–90 × 2–3.6–5

Remarks: This species differs from the related species *Callyspongia patulus* n. sp. in coloration, the shape of the oscules, in spicule measurements, and in having no free spicules in the flesh of the endosome.

46. *Callyspongia fibrosa* (Ridley et Dendy, 1886)

Dasychalina fibrosa Ridley et Dendy, 1886, p. 330.
Pachychalina fibrosa: Ridley et Dendy, 1887, p. 21, Pl. 4, figs. 3–4.
Callyspongia fibrosa: Tanita, 1970b, p. 101, Pl. 1, fig. 5.

Distribution: Off Bahia; off Bermuda.
In Japan — Yuki.

47. *Callyspongia flabelliformis* Tanita, 1968

(Fig. 34)

Callyspongia flabelliformis Tanita, 1968, p. 43, Pl. 1, fig. 2, t-fig. 3.

Material examined: SIS–013, Shijushima, 1–VIII–1975; SIS–043, Shijushima, 9–VIII–1971; SIS–054, Shijushima, 25–V–1970; SIS–058, Shimoebujima 10–II–1972; SIS–070, Mukaishima, 20–VIII–1972; SIS–078, Mukaishima, 25–VIII–1969; SIS–094, Shijushima, 11–VII–1975; SIS–095, Shijushima, 24–V–1975; SIS–098, Ategishima, 8–IX–1975; SIS–140, Sasajima, 11–VI–1975; SIS–159, Mukaishima, 26–V–1975.

Dimensions: 25 × 16 × less than 1 (thickness) cm, (SIS–043).

Habitat: Intertidal zone, low tide subzone, in shaded locations under rocks.

Shape: Irregular, large, thin or thick encrusting sponge. Occasionally slightly massive with or without several to numerous spherical lobes, or ramose with numerous irregular branches.

Color: Isabella Color 05GC, Maple 07GD, Ivory Buff 04EB or Light Grayish 04GF. The majority of specimens are Isabella Color 05GC.

Consistency: Very elastic, fairly tough.

Surface: Smooth to touch and very minutely hispid, coarsely undulated.

Oscules are 2–5 mm in diameter, and scattered sparsely to abundantly over the entire surface. Occasionally, they are somewhat elevated relative to neighboring areas.

Ectosome: Irregular reticulation of fibers cored with single to double rows of spicules. The fibers are commonly 20–30 μm in diameter. The meshes are commonly triangular to rectangular, 200–400 μm in maximum dimension.

Endosome: Rectangular netwoks of primary and secondary fibers. Primary fibers run parallel to one another from base to surface, and are connected with secondary fibers at near right angles. Primary fibers are tri- or multispicular and 40–50 μm in diameter. The secondary fibers are mostly uni- or bispicular, and 30–40 μm in diameter. Meshes are commonly irregular rectangular, 300–400 μm in maximum dimension.

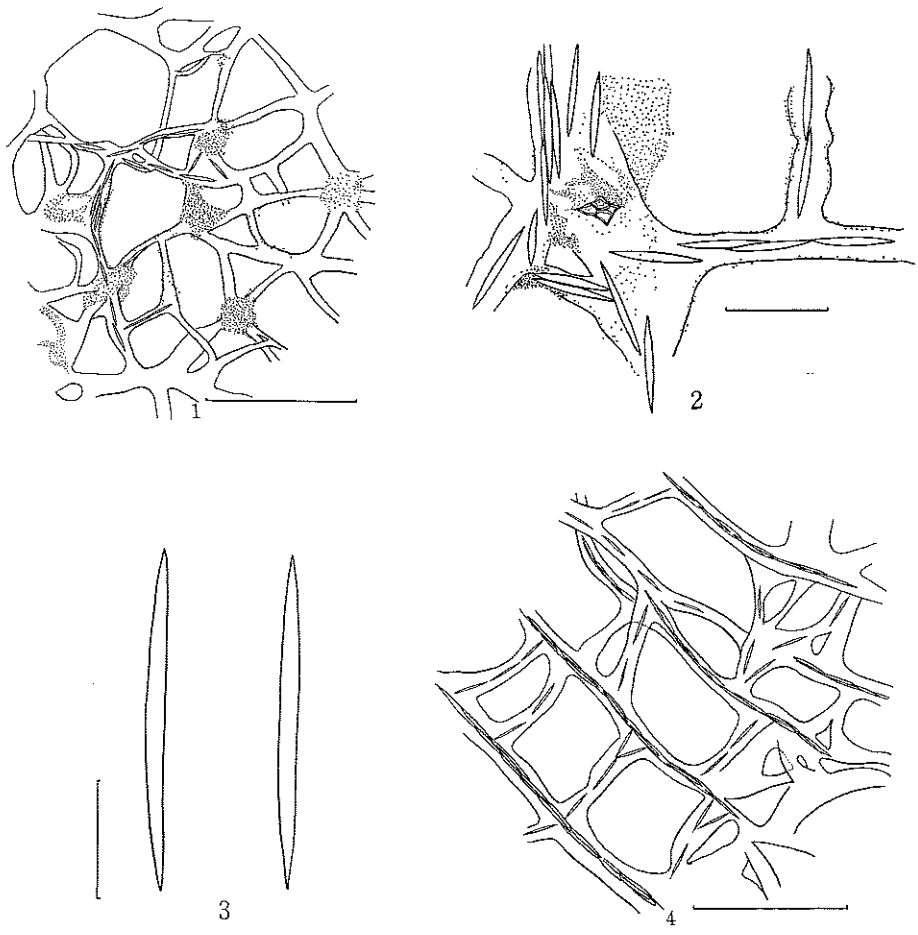


Fig. 34. *Callyspongia flabelliformis* Tanita. (SIS–043).

1. Portion of skeleton at ectosome. Scale: 500 μm. 2. Spicule arrangement in skeletal fiber of ectosome. Scale: 100 μm. 3. Spicule; Oxea. Scale: 30 μm. 4. Portion of skeleton in endosome (cross section). Scale: 500 μm.

Spicule: Oxeon only — Smooth, fusiform, nearly straight, measuring 80–88–92 × 5–5–6 μm (SIS–043).

Distribution: In Japan — Ariake Sea.

Note: Dimensions and spicule measurements of representative specimens are as follows:

	Dimensions of specimen	Spicule measurements
		Oxeon
SIS–043	25 × 16 × less than 1 cm	80–88–92 × 5–5–6
SIS–094	15 × 12 × 6 cm	80–84–90 × 6–6.5–7 and 75–80–85 × 3–3.5–4 (juvenile)
SIS–098	10 × 7 × 6 cm	75–78–80 × 6–7–8 and 70–72–75 × 2–3–5 (juvenile)

Remarks: This species was originally described from the Ariake Sea with another closely related species, *Callyspongia ariakensis* Tanita, by Tanita (1968). He stated that the two species could be distinguished by the endosome reticulation of the skeleton.

48. *Callyspongia murex* n. sp.

(Fig. 35; Pl. 4, Fig. 3)

Material examined: AR–1–67 (Holotype), Matsushima Maeshima, 16–V–1972.

Dimensions: 1 × 1 × 3 (length) cm.

Habitat: Intertidal zone, mid tide subzone to low tide subzone, on rocky surface.

Shape: Small, short, irregular and solid cylindrical sponge.

Color: Light Mauve 45HA in life, Ecru 08ED when dry.

Consistency: Elastic and very tough.

Surface: Partly smooth, partly minutely hispid, uneven. Oscules are 1.5–2 mm in diameter and open in places. Pores invisible.

Ectosome: Typical callyspongid intergrading network. The coarsest tracts contain six to seven rows of spicules, and form triangular or rectangular network of 500–700 μm in maximum dimension. This coarse network is filled with tri- or rectangular meshes, 100–300 μm in maximum dimension, forming fine tracts.

Endosome: Irregular reticulation of tracts. Primary and secondary tracts are indistinguishable, both containing five to ten rows of spicules. Meshes are nearly rectangular and measure 300–800 μm in maximum dimension. Numerous oxea are found free of the tracts.

Spicule: Oxeon only with two forms and size groups.

Thick oxeon — Smooth, hastate, straight to gently curved with each end sharply pointed. These spicules mainly form tracts. Size range 90–100–110 × 7–10–11 μm.

Thin oxeon — Smooth, fusiform, gently curved with each end sharply pointed.

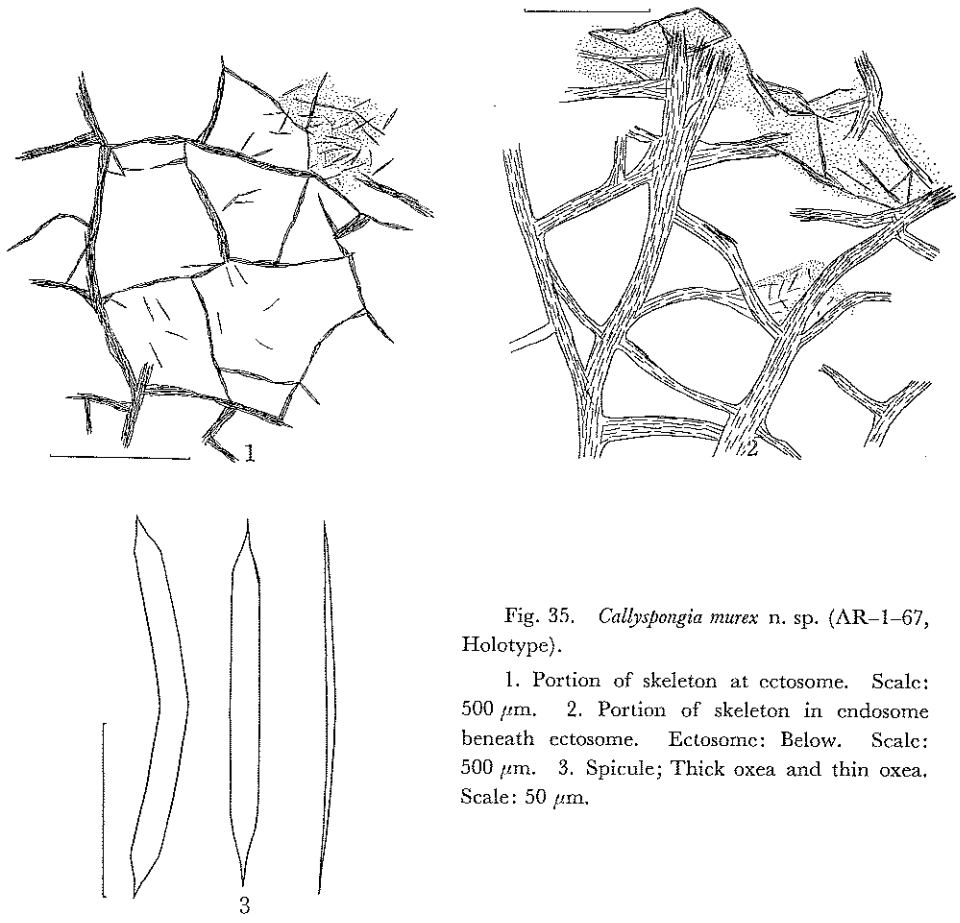


Fig. 35. *Callyspongia murex* n. sp. (AR–1–67, Holotype).

1. Portion of skeleton at ectosome. Scale: 500 μm. 2. Portion of skeleton in endosome beneath ectosome. Ectosome: Below. Scale: 500 μm. 3. Spicule; Thick oxea and thin oxea. Scale: 50 μm.

These spicules are found mainly in the flesh. Size range 82–98–110 × 2–3–4 μm.

Remarks: This species is unusual in the genus *Callyspongia* in regard to its mid tide subzone habitat.

49. *Callyspongia palmata* (Lamarck, 1813)

Spongia palmata Lamarck, 1813, p. 453.
Chalina palmata: Ridley et Dendy, 1887, p. 26, Pl. 5, fig. 4.
Callyspongia palmata: Tanita, 1961d, p. 340, Pl. 1, fig. 4; Hoshino, 1971, p. 25.

Distribution: Indian Ocean; European Sea; Torres Strait; New South Wales: West Australia.

In Japan — Inland Sea of Japan

50. *Callyspongia patulus* n. sp.

(Fig. 36; Pl. 4, Fig. 4)

Material examined: MIT–004 (Holotype), MIT–013, MIT–023, MIT–024, MIT–031, MIT–038, MIT–042, MIT–049, Mitsukue, 5–XI–1975; MIT–086, Shionashi, 5–XI–1975.

Dimensions: $8 \times 7 \times 5$ cm, an anastomosing branchy sponge, (MIT–004).

Habitat: Subtidal zone, 15 m in depth, on rocky surfaces.

Shape: Anastomosing mass of solid cylindrical branches, 7–12 mm in diameter, and slightly depressed, with two to three points of branchy mass attached to stone surface.

Color: Grayish Lavender 45DB or Warm Gray d10.

Consistency: Only slightly compressible in life, not compressible when dry.

Surface: Smooth to touch. Oscules are 1–3 mm in diameter, arranged in a row at intervals of 5–10 mm on the ridge of each branch, and are rimmed. Pores invisible.

Ectosome: An intergrading double network of coarse fibers, fine spiculofibers or single spicules. The reticulation of coarse fibers are polygonal, 100–400 μm in maximum dimension. These fibers each contain eight to ten rows

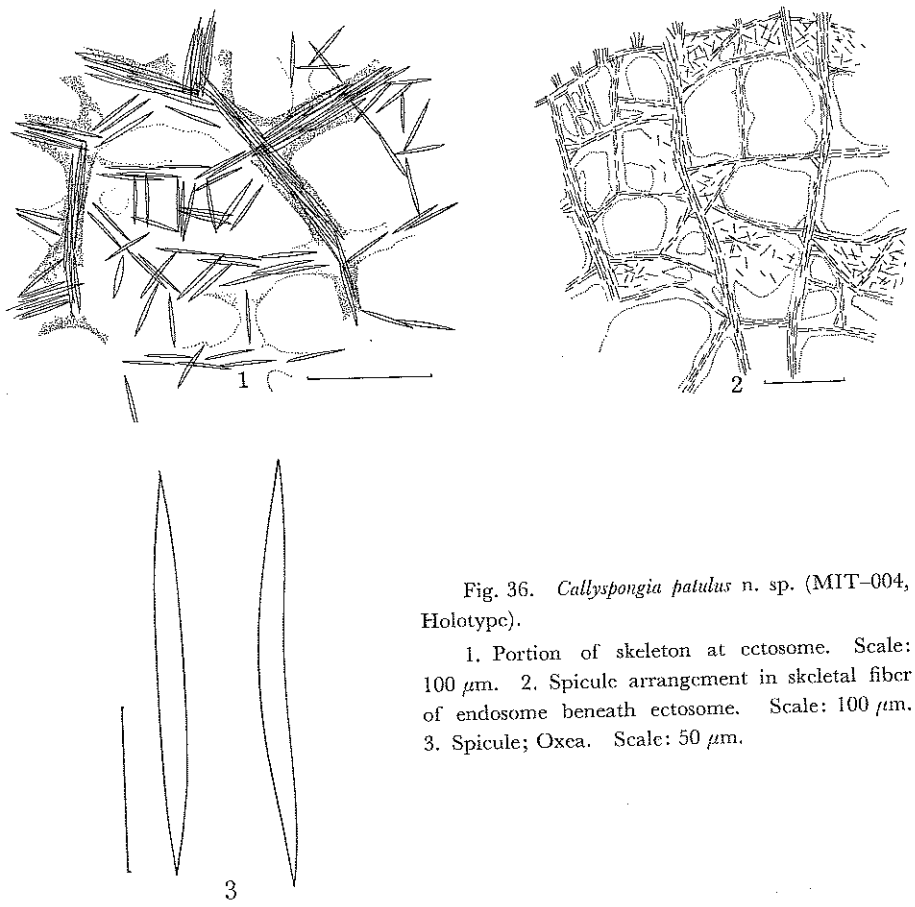


Fig. 36. *Callyspongia patulus* n. sp. (MIT–004, Holotype).

1. Portion of skeleton at ectosome. Scale: 100 μm. 2. Spicule arrangement in skeletal fiber of endosome beneath ectosome. Scale: 100 μm. 3. Spicule; Oxea. Scale: 50 μm.

of spicules. Coarse fibers are graded into network of slender fibers or single spicules.

Endosome: A well developed network of primary and secondary fibers. All fibers range 40–60 μm in diamter, and contain several tens of rows of spicules. Meshes are irregularly rectangular, measuring 100–400 μm in maximum dimension. Numerous free spicules are found in the flesh.

Spicule: Oxeon only — Smooth, slightly arched and tapering to a point at each end. Size range 125–143–150×6–7–8 μm (MIT–004).

Note:

	Dimensions of branchy masses	Spicule measurements
		Oxeon
MIT–004	8×7×5 cm	125–143–150×6–7–8
MIT–013	6×13×1	120–135–156×6–6.5–7
MIT–023	0.8×0.8×5.5 (length) cm, single branch	111–136–150×8–9–10
MIT–024	0.5×0.7×15 (〃)	125–135–145×4–6.6–9
MIT–031	1×1×7 (〃)	95–135–155×6–8–10
MIT–038	2×3×1	120–126–135×4–5.7–7
MIT–042	0.7×0.7×3	120–135–145×5–7–9
MIT–049	0.7×1.0×3	130–135–140×6–6.6–10
MIT–086	Small fragment	125–141–150×4–5.5–7

Remarks: This species resembles *Callyspongia ecklonia* n. sp., but differs in coloration and spicule measurement.

51. *Callyspongia ramosa* (Gray, 1843)

(Fig. 37)

Spongia ramosa Gray, 1843, p. 295.

Chalina oculata var. *novaezealanidae* Dendy, 1924, p. 326.

Cladochalina dendyi Burton, 1929, p. 421.

Callyspongia ramosa: Burton, 1934a, p. 17, Pl. 2, fig. 3; Tanita, 1961d, p. 341, Pl. 1, fig. 5; 1977, p. 33, Pl. 1, fig. 3, Kim *et al*, 1968, p. 39, Pl. 1, fig. 3, t-fig. 4; Hoshino, 1971, p. 25.

Material examined: SIS–107, Shijushima, 24–V–1975.

Dimensions: 5×0.5×8 (height) cm.

Habitat: Subtidal zone.

Shape: Irregular, erect, ramose sponge. Sponge is composed of a large flat portion with branches extending from the margin. These branches are up to 1×0.5 cm in thickness, 3–5 cm in height and reach 8 cm in total hight of sponge.

Color: Apricot Orange 16HB.

Consistency: Very elastic and tough.

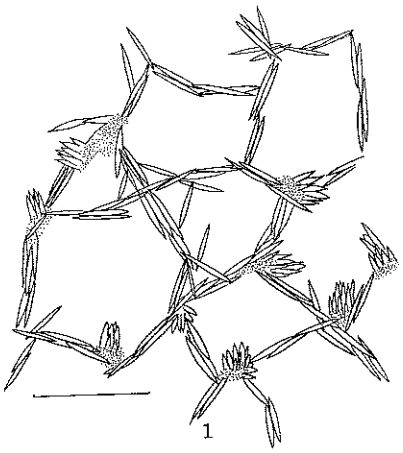
Surface: Minutely hispid, even. Oscules are less than 1 mm in diameter and fall in a line at intervals of 2–3 mm on marginal surface. Pores microscopic.

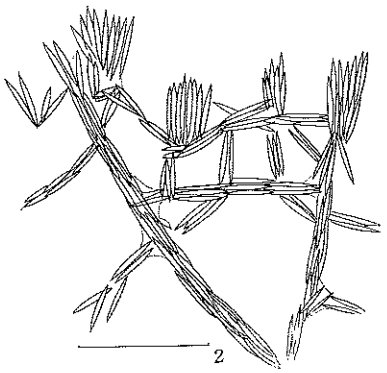
Ectosome: Irregular reticulation of spicule tracts, 15–20 μm in diameter, containing several rows of oxea. Meshes are triangular, rectangular, or polygonal, 100–450 μm in maximum dimension, with the length of each letus equivalent to two or three times the spicule length. Brushes of several spicules protrude at the intersections of tracts.

Endosome: Reticulation of primary and secondary fibers. Primary fibers, 20–30 μm in diameter, and 150–300 μm apart, ascend from the inner portion to the surface, and are connected with the secondary fibers, 15–20 μm in diameter, as a lottery.

Spicule: Oxeon only — Smooth, fusiform, thin to stout, both ends sharply pointed, or occasionally blunt. Size range 100–133–160 × 4–8–12 μm.

Distribution: New Zealand; Victoria Land; Falkland Islands; Korea Strait. In Japan — Kurushima Strait; Shirahama.





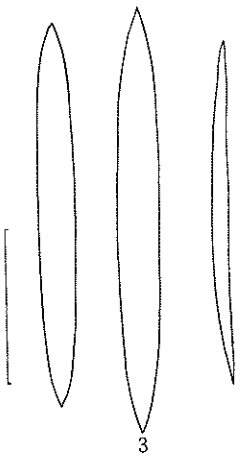


Fig. 37. *Callyspongia ramosa* (Gray). (SIS–107).
1. Portion of skeleton at ectosome. Scale: 300 μm. 2. Portion of skeleton in endosome beneath ectosome. Ectosome: Upper. Scale: 300 μm. 3. Spicule; Oxea. Scale: 50 μm.

52. *Callyspongia rectangularis* (Ridley et Dendy, 1886)

Chalina rectangularis Ridley et Dendy, 1886, p. 331; 1887, p. 27, Pl. 5, fig. 3, Pl. 46, fig. 6.
Callyspongia rectangularis: Tanita, 1977, p. 33, Pl. 1, fig. 4.

Distribution: Philippines.
In Japan — Shirahama.

53. *Callyspongia robusta* (Ridley, 1884)

Toxochalina robusta Ridley, 1884, p. 403, Pl. 39, fig. G, Pl. 41, figs. n and n′; Ridley et Dendy, 1887, p. 50; Dendy, 1905, p. 139; Brøndsted, 1934, p. 17; figs. 14–15.
Toxochalina robusta var. *ridleyi* Dendy, 1905, p. 140, Pl. 9, fig. 2.
Callyspongia robusta: Bergquist, 1961b, p. 171, fig. 2; Tanita, 1977, p. 34, Pl. 1, fig. 5, t-fig. 3.

Distribution: Australia; New Zealand; Ceylon Sea; Amirante; Natal Coast; off Bahia.
In Japan — Shirahama.

54. *Callyspongia subarmigera* (Ridley, 1884)

(Fig. 38; Pl. 4, Fig. 5)

Cladochalina subarmigera Ridley, 1884, p. 397, Pl. 39, fig. H, Pl. 41, Fig. L.
Pachychalina fibrosa var. *gracilis* Wilson, 1925, p. 412.
Callyspongia subarmigera: Burton, 1934, p. 540; Bergquist, 1965, p. 152, fig. 15 a–c.

Material examined: AR–1–13, AR–1–15, AR–1–17, AR–1–18, AR–1–19, AR–1–20, AR–1–21, AR–1–29, Ariake Sea (near the Aitsu M.B.S.), 16–V–1972.

Dimensions: $1 \times 1 \times 13$ (length) cm, (AR–1–19).

Habitat: Subtidal zone, 10–20 m in depth, on carbonate bottom.

Shape: Unbranched or branched, solid cylindrical sponge, about 1 cm in diameter, bearing pominent spinous proccsses 3–5 mm in height. Occasionally these proccsses are obscure.

Color: Ecru 08ED or Light Brown Drab 04NH.

Consistency: Compressible, fairly tough.

Surface: Smooth, uneven due to spinous processes. Oscules are 0.5–0.7 cm in diameter and arranged on the upper surface. Pores invisible.

Ectosome: Typical reticulation of the genus *Callyspongia*. A well developed double to triple network of spiculo-fibers. The coarsest fibers are 40–70 μm in diameter and form coarse rectangular networks 300–500 μm in maximum dimension. Between the coarse meshes, fine fibers form an intergrading, triangular network. These fine fibers are unispicular to polyspicular.

Endosome: Reticulation of primary and secondary fibers. Primary fibers, 70–80 μm in diameter, radiate from an excentric hub. These fibers are connected, at nearly right angles, with secondary fibers, 40–50 μm in diameter, at irregular intervals. Both fibers are densely packed with spicules.

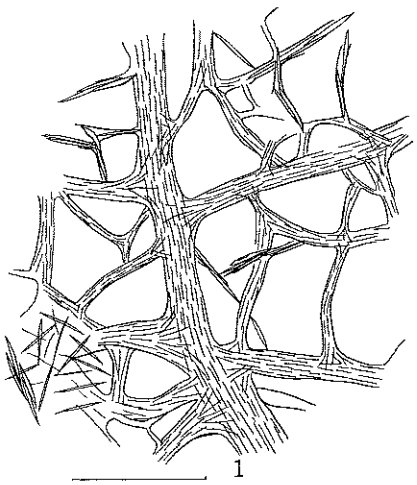
Spicule: Oxeon only — Smooth, hastate, straight or gently curved, each tapering to a blunt end, but occasionally the ends are sharply pointed. Size range 90–94–105 × 2–5–6 μm (AR–1–19).

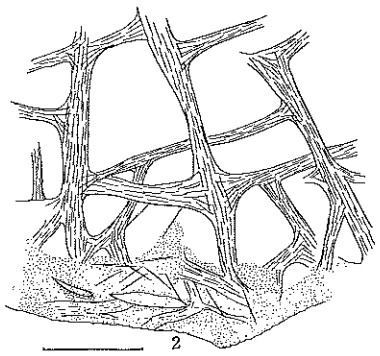
Distribution: Northern Australia, Philippine.

In Japan — Newly recorded.

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
AR–1–13	2 × 1 × 5 (length) cm	94–101–105 × 3–4.6–6
AR–1–15	1 × 1 × 10 (〃)	80–93–98 × 3–3–5
AR–1–17	1 × 1 × 9 (〃)	82–87–95 × 3–4.4–6
AR–1–18	4 × 6 × 11 cm, branchy mass	78–87–96 × 3–4.4–7
AR–1–19	1 × 1 × 13 (〃)	90–94–105 × 2–5–6
AR–1–20	1 × 1 × 9 (〃)	86–92–102 × 4–6.4–8
AR–1–21	1 × 1 × 5 (〃)	78–82–92 × 3–3.4–4
AR–1–29	several fragment	





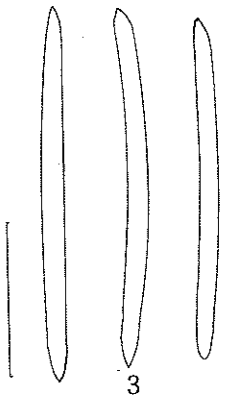


Fig. 38. *Callyspongia subarmigera* (Ridley). (AR–1–19).

1. Portion of skeleton at ectosome. Scale: 500 μm. 2. Portion of skeleton in endosome beneath ectosome. Ectosome: Below. Scale: 500 μm. 3. Spicule; Oxea. Scale: 50 μm.

Remarks: This species is well characterized by its external form.

55. *Callyspongia variabilis* (Dendy, 1890)

(Fig. 39)

Pachychalina variabilis Dendy, 1890, p. 353, Pl. 8, fig. 3, Pl. 60, fig. 2.
Callyspongia variabilis: Tanita, 1967, p. 114; Hoshino, 1971, p. 25.

Material examined: SIS–011, Mukaishima, 10–VIII–1972.

Dimensions: $12 \times 7 \times 11$ (height) cm.

Habitat: Low tide subzone or subtidal zone.

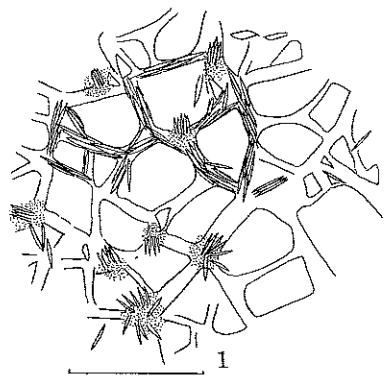
Shape: Ramose sponge with several erect and compressed branches which are ramified and expand upward from upper margins.

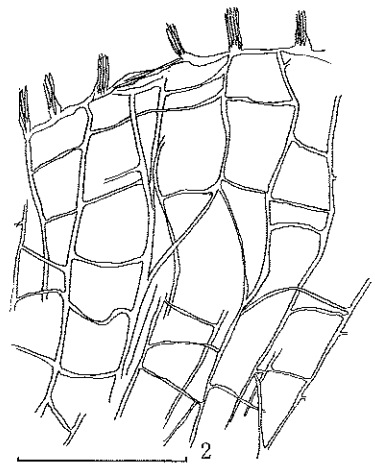
Color: Yellow Orange 10LA.

Consistency: Very elastic and tough.

Surface: Rough to touch, almost even. Numerous oscules open on the surface of the one side only. Pores invisible.

Ectosome: Irregular reticulation of spiculo-fibers which are similar in size, 20–40 μm across, and are cored with several to several tens of rows of oxea.





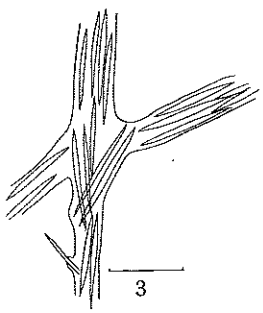


Fig. 39. *Callyspongia variabilis* (Dendy). (SIS–011).

1. Portion of skeleton at ectosome. Scale: 500 μm. 2. Portion of skeleton in endosome beneath ectosome. Scale: 500 μm. 3. Spicule arrangement in skeletal fiber of endosome. Scale: 50 μm.

Meshes are 100–300 μm in maximum dimension and are triangular to polygonal in shape. The tips of primary fibers from the endosome protrude 50–100 μm in height from this ectosome reticulation.

Endosome: Fairly regular networks of primary and secondary fibers. Primary fibers are 30–50 μm across, running 100–200 μm apart, and are connected with the secondary, as a lottery.

Spicule: Oxeon only — Smooth, fusiform, almost straight, with both ends tapering to points. Size range 130–143–160 × 5–6–7 μm.

Distribution: Bahamas.

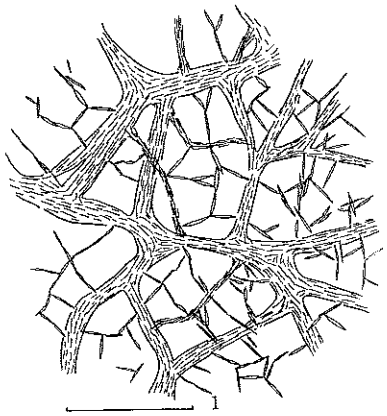
In Japan — Takeno; Inland Sea of Japan.

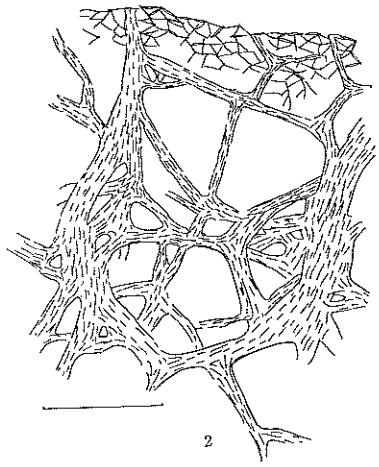
56. *Callyspongia waguensis* Tanita, 1961

(Fig. 40)

Callyspongia waguensis Tanita, 1961b, p. 134, Pl. 3, figs. 4–5, t-fig. 3; 1970a, p. 89, Pl. 1, fig. 5, Pl. 2, fig. 6; 1977, p. 35; Hoshino, 1976a, p. 248.

Material examined: JAP–004, Tokushima, 26–X–1976 (Mr. Komatsu leg.).





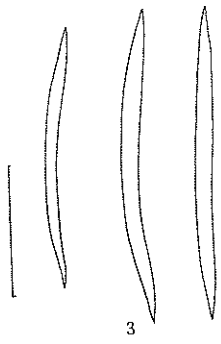


Fig. 40. *Callyspongia waguensis* Tanita. (JAP–004).

1. Portion of skeleton at ectosome. Scale: 500 μm. 2. Portion of skeleton in endosome beneath ectosome. Ectosome: Upper. Scale: 500 μm. 3. Spicule; Oxea. Scale: 50 μm.

Dimensions: $9 \times 6 \times 3.5$ (height) cm.

Habitat: Subtidal zone.

Shape: Scyphiform sponge, remarkably extended in the upper portion, with a single and very short stalk attached to the substratum. The extended margin of the upper portion is undulated.

Color: Tawny Olive 08LD when dry.

Consistency: Very hard and tough when dry.

Surface: Outer surface is smooth and markedly uneven due to irregular and variable protuberances, 0.5–5 mm wide and 0.5–0.8 cm high, and is lipostomous. The inner surface is smooth and uneven due to several irregular protuberances and numerous oscules, 0.5–2 mm in diameter and 1–2 mm apart.

Ectosome: Typical callyspongid triple reticulation. Thicknesses of tracts are 30–50, 20–25, and 5–10 μm respectively. The thickest tracts are densely packed with spicules, forming triangular to polygonal meshes of up to 900 μm in maximum dimension. The tracts of intermediate thickness are also densely packed with spicules, and the thinnest tracts are uni- or dispicular. The latter two form triangular to polygonal reticulations between meshes of the thickest tracts.

Endosome: Irregular reticulation of tracts, densely packed with spicules, varying from 20 to 80 μm in diameter.

Spicule: Oxeon only — Smooth, fusiform, slightly arched or bent at the middle and sharply pointed at each end. Size range 98–111–123 $\times$ 4–5.5–8 μm.

Distribution: In Japan — Sagami Bay; Kii Peninsula.

Genus *Ceraochalina* Lendenfeld, 1887

57. *Ceraochalina differentiata* Dendy, 1921

Ceraochalina differentiata Dendy, 1921a, p. 34, Pl. 3, fig. 7 Pl. 12, fig. 11; Tanita, 1964, p. 17; 1965a, p. 47; 1969, p. 73; 1977, p. 35; Kim *et al*, 1968, p. 39, Pl. 1, fig. 4, t-fig. 5; Rho *et al*, 1969, p. 155; Hoshino, 1975c, p. 18, Pl. 1, fig. 7

Distribution: Amirante; Korea Strait.

In Japan — Tsukumo Bay; Sea of Japan.

58. *Ceraochalina sphaericuslobatus* n. sp.

(Fig. 41; Pl. 4, Fig. 6)

Material examined: JAP–011 (Holotype), Uwajima, 16–V–1977 (Dr. Katayama leg.); SAT–080, Uchinoura, 5–XI–1975; SIS–010, Hosonosu, 6–XI–1971.

Dimensions: $11 \times 10 \times 5$ (thickness) cm, (JAP–011).

Habitat: Intertidal zone or subtidal zone.

Shape: Irregular, massive sponge with numerous hemispherical lobes, 1.5–4 cm in diameter. Occasionally ellipsoid, cylindrical, or ramose with several

compressed branches.

Color: Maple 07GD or Laelia Pink 33ED.

Consistency: Very elastic and tough.

Surface: Smooth to touch. One or two oscules, 3–4 mm in diameter, open at the summits of the lobes. Pores invisible.

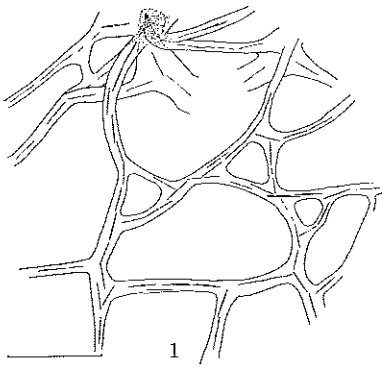
Ectosome: Irregular reticulation of unispicular fibers, 15–30 μm in diameter. Meshes are triangular to polygonal, 300–500 μm in maximum dimension, and occasionally exceed this limits.

Endosome: Reticulation of the primary and secondary fibers. Primary fibers are 30–40 μm in diameter and are cored with several rows of spicules ascending 200–350 μm apart. Secondary fibers are exclusively unispicular, and connect at nearly right angles with the primary fibers at intervals of 200–400 μm.

Spicule: Oxeon only — Smooth, straight to slightly arched, tapering to a point at each end. Size range 75–80–83 × 2–3.5–5 μm (JAP–011).

Note:

	Dimensions of specimen	Spicule measurements
		Oxeon
JAP–011	11 × 10 × 5 (thickness) cm	75–80–83 × 2–3.5–5
SAT–080	4 × 2 × 3	70–72–75 × 3–3.5–4
SIS–010	7 × 1 × 10 (height)	66–68–75 × 5–6–6



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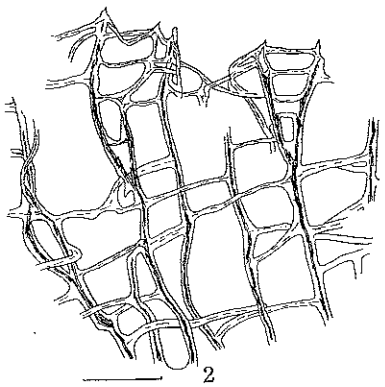

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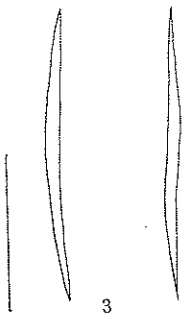


3

Fig. 41. *Ceraochalina sphaericuslobatus* n. sp. (JAP–011, Holotype).

1. Portion of skeleton at ectosome. Scale: 200 μm. 2. Portion of skeleton in endosome beneath ectosome. Ectosome: Upper. Scale: 500 μm. 3. Spicule; Oxea. Scale: 50 μm.

Remarks: This species characterized by the external form of the hemispherical lobal mass. The spicule sizes resemble another species in this study *(C. differentiata)*.

Genus *Siphonochalina* Schmidt, 1868

59. *Siphonochalina truncata* Lindgren, 1897

(Fig. 42)

Siphonochalina truncata Lindgren, 1897, p. 481; 1898, p. 296, Pl. 18, figs. 6, 7a–b, Pl. 19, figs. 8a–b; Tanita, 1961b, p. 132, Pl. 3, figs. 1–2, t-fig. 1; 1961d, p. 339, Pl. 1, fig. 2; 1970a, p. 89, Pl. 1, fig. 4; 1970b, p. 100; 1976, p. 249, Pl. 1, figs. 4–6, t-fig. 1; 1977, p. 30; Hoshino, 1971, p. 25; 1975a, p. 31, Pl. 1, fig. 6, Pl. 3, figs. 4–5; 1975c, p. 18, Pl. 1, fig. 3.

Material examined: MIT–005, MIT–008, MIT–037, MIT–058, MIT–075, Mitsukue, 5–XI–1975; MIT–084, Shionashi, 5–XI–1975; MIT–102, MIT–108, Mitsukue, 4–XI–1973; SAT–002, Uchinoura, 5–XI–1975; JAP–005, Tokushima, 26–X–1976 (Mr. Komatsu leg.); JAP–012, Uwajima, ?–?–1976 (Dr. Katayama leg.).

Dimensions: The largest specimen is $5 \times 15 \times 32$ (height) cm, (MIT–075).

Habitat: Subtidal zone, usually 10–15 m in depth, but occasionally outside these limits.

Shape: Ramose or small and massive in juvenile. Many solid cylindrical and compressed branches spread from the single basal trunk attached to stone. Each branch is 0.7–2.0 cm wide and 0.5–0.7 cm thick.

Color: Violet Red 40PE or Laelia Pink 33ED or Vernonia Purple 30IF.

Consistency: Not very spongy. Fragile when dry.

Surface: Smooth touch. Oscules are 2–4 mm in diameter, almost rounded, and scattered on one side of the branches, 2–3 cm apart. Pores invisible.

Ectosome: A well developed double or triple network of spiculo-fibers. The

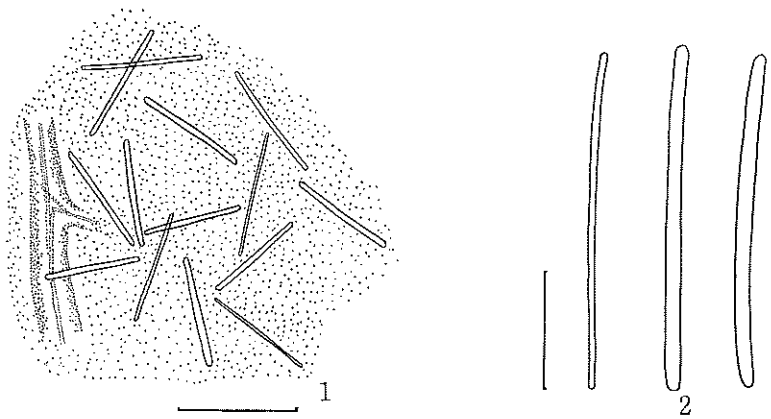


Fig. 42. *Siphonochalina truncata* Lindgren. (MIT–005).
1. Portion of skeleton at ectosome. Scale: 100 μm. 2. Spicule; Strongyles. Scale: 30 μm.

coarse fibers are 30–40 μm in diameter and contain six to ten rows of spicules in the central portion, making triangular or rectangular meshes of 200–800 μm across. Thinner fibers make up finer meshes, 40–100 μm in diameter, within the meshes of coarse fibers, containing one to two rows of spicules in the central part.

Endosome: Irregular reticulation of primary and secondary spiculo-fibers. Fibers are 20–60 μm in diameter and contain two to ten rows of spicules in the central portion. The primary and secondary fibers are similar in morphology. The reticulations are triangular or rectangular and are commonly 300–400 μm in diameter.

Spicule: Strongyle only — Smooth, straight or slightly arched, not varying in width throughout the length of the spicule. Size range 84–91–99 × 2.5–3.3–4.0 μm (MIT–005).

Distribution: Coast of Cochinchina.

In Japan — Sagami Bay; Kii Peninsula; Coast of Tokushima Pref., Hibiki-Nada in Yamaguchi Pref.

Note: Dimensions and spicule measurements of representative specimens are as follows:

	Dimensions of specimen	Spicule measurements
		Strongyle
MIT-005	2 × 20 × 28 cm	84–91–99 × 2.5–3.3–4.0
MIT–075	5 × 15 × 32	80–90–98 × 4–5–6
SAT–002	14 × 2 × 21	74–97–105 × 4–5–6
JAP–005	6 × 0.7 × 9	90–97–105 × 4–5–6

Order Poecilosclerida Topsent, 1928

Group Phorbasiformes De Laubenfels, 1936

Family Phorbasidae De Laubenfels, 1936

Genus *Anchinoe* Gray, 1867

60. *Anchinoe novaezealandiae* Dendy, 1924

Anchinoe novaezealandiae Dendy, 1924, p. 360, Pl. 12, fig. 2, Pl. 15, figs. 9–11; Brøndsted, 1924, p. 466; Bergquist, 1961b, p. 179, fig. 6; Tanita, 1967, p. 116, Pl. 2, fig. 7, t-fig. 3.

Distribution: New Zealand; Chatham Island.

In Japan — Tajima.

61. *Anchinoe purpurea* Tanita, 1961

(Fig. 43; Pl. 11, Figs. 1–4)

Anchioe purpurea (sic) Tanita, 1961d, p. 344, Pl. 3, fig. 11; Hoshino, 1970, p. 23, fig. 2 (5), fig. 3 (4); 1971, p. 24.

Material examined: SIS–041, Sasajima, 17–VIII–1969; SIS–074, Mukaishima, 14–XI–1969; MIT–016, MIT–020, Mitsukue, 4–XI–1973; MIT–029, Mitsukue, 5–XI–1975; MIT–039, MIT–041, Mitsukue, 4–XI–1973; MIT–080, Shionashi, 5–XI–1975; MIT–105, MIT–106, Mitsukue, 4–XI–1973.

Dimensions: $4 \times 3 \times 1$ (thickness) cm, (SIS–074).

Habitat: Intertidal zone to subtidal zone, on rocky substrate or on crab carapace.

Shape: Thin encrusting or irregular ramose with several erect irregular branches emanating from thin encrusting part, occasionally small massive.

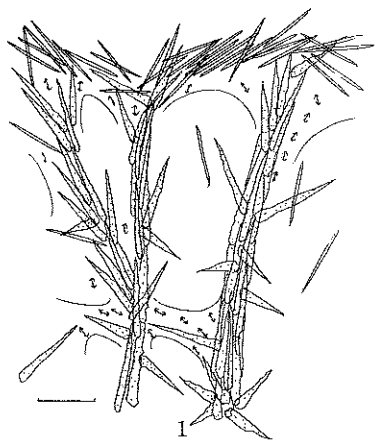
Color: Indian Lake 29MC or Peach Red 20LA or Contiga Purple 35PG or Pinkish Cinnamon 08GB.

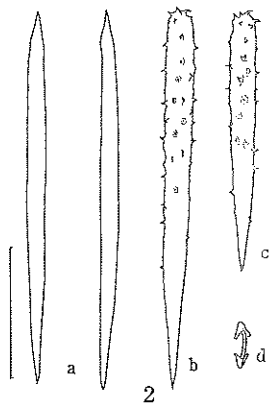
Consistency: Tough and slightly compressible, occasionally soft.

Surface: Uneven, honeycomb-like with numerous irregular cavities 0.5–1 mm wide. Pores and oscules invisible.

Ectosome: Confused, horizontal arrangement of tornotes.

Endosome: Irregular reticulation of well developed primary tracts, which ascend, branching and running together, from base to surface, and are composed





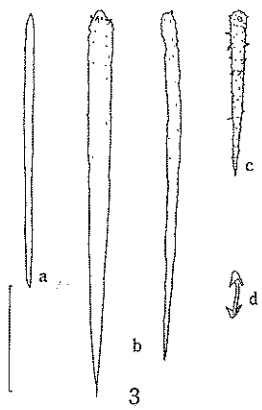


Fig. 43. *Anchinoe purpurea* Tanita. (SIS–074).

1. Portion of skeleton in endosome beneath ectosome. Scale: 100 μm. 2. Spicule; Tornotes (a), large acanthostyle (b), small acanthostyle (c) and isochela (d). Scale: 50 μm. 3. Spicule (MIT–016); Tornote (a), large acanthostyles (b), small acanthostyle (c) and isochela (d). Scale: 50 μm.

of several rows of large acanthostyles, densely packed, and echinated with small acantostyles. These tracts are 25–30 μm in diameter. Isochelae are found abundantly in the flesh, and occasionally tornotes.

Spicule: Tornote; Large Acanthostyle; Small Acantohostyle; and Isochela.
Tornote — Smooth, straight or slightly arched, or in some specimens, slightly sinuous, with each end abruptly pointed, and tapering from one end to the another. Size range 135–146–160 × 5–6–8 μm (SIS–074).
Large Acanthostyle — Straight to gently curved, coarsely spined throughout length, very densely spined at or near base. Size range 135–155–170 × 10–11–12 μm (SIS–074).
Small Acanthostyle — Straight, sharply spined throughout length. Size range 85–100–120 × 8–9–11 μm (SIS–074).
Isochla — Palmate type, 15 μm long (SIS–074).

Distribution: In Japan — Inland Sea of Japan.

Note: Dimensions and spicule measurements of representative specimens are as follows:

	Dimensions of specimens	Spicule measurements	
		Tornote	Larege Acanthostyle
SIS–074	4 × 3 × 1 cm	135–146–160 × 5–6–8	135–155–170 × 10–11–12
MIT–016	5 × 7 × 0.5	155–169–183 × 3–3.3–4	195–217–240 × 9–11–13
MIT–039	3 × 2 × 0.3	150–163–170 × 3–3.4–4	190–226–270 × 11–14–18
MIT–080	6 × 8 × 0.3	147–156–165 × 3–4–5	140–159–175 × 7–8.7–10
MIT–106	4 × 5 × 1	145–167–180 × 2–3–4	200–249–295 × 10–12–14

Spicule measurements		
	Small Acanthostyle	Isochela
	85–100–120 × 8–9–11	15
and 160–189–225 × 4–6–7	80–84–95 × 6–6.7–9	12
and 160–170–215 × 5–7–10	83–93–115 × 7–7.6–8	15
and 130–147–158 × 5–6–7	90–103–115 × 5–5.5–7	16 and 20
	70–87–100 × 7–8–10	15–20

In specimens having two categories of large acanthostyles, stout spicules play a part as echinating in tracts of spicules.

Family Adociidae De Laubenfels, 1936

Genus *Adocia* Gray, 1867

62. *Adocia cinerea* (Grant, 1827)

Spongia cinerea Grant, 1827, p. 204, Pl. 2, fig. 3.
Haliclona cinerea: De Laubenfels, 1932, p. 120, fig. 74; Koltun, 1959, p. 219, fig. 179; Tanita, 1964, p. 17, Pl. 1, fig. 2.

Adocia cinerea: Tanita, 1970b, p. 101.
(for detailed synonymy, see Tanita, 1964)

Distribution: Cosmopolitan.
In Japan — Noto; Ariake Sea; Tokushima.

Genus *Sigmadocia* De Laubenfels, 1936

63. *Sigmadocia liber* n. sp.

(Fig. 44; Pl. 5, Fig. 1)

Material examined: SAT–001–a (Holotype), Uchinoura, 5–XI–1975.
Dimensions: $1 \times 1 \times 0.2$ (thickness) cm.
Habitat: Subtidal zone, 12–13 m in depth, on barnacle shells.
Shape: Very thin encrusting sponge.
Color: Gray.
Consistency: Very soft.
Surface: Smooth, even. Oscules and pores invisible.
Ectosome: No dermal specialization.
Endosome: Very loose, irregular reticulation of spiculo-fibers of oxea. Primary fibers are 30–50 μm thick, and contain ten to twenty rows of spicules. Secondary fibers are 10–20 μm thick, and contain one to ten or more rows of spicules. Sigmata are found near the spiculo-fibers or in the flesh.
Spicule: Oxeon and Sigma.

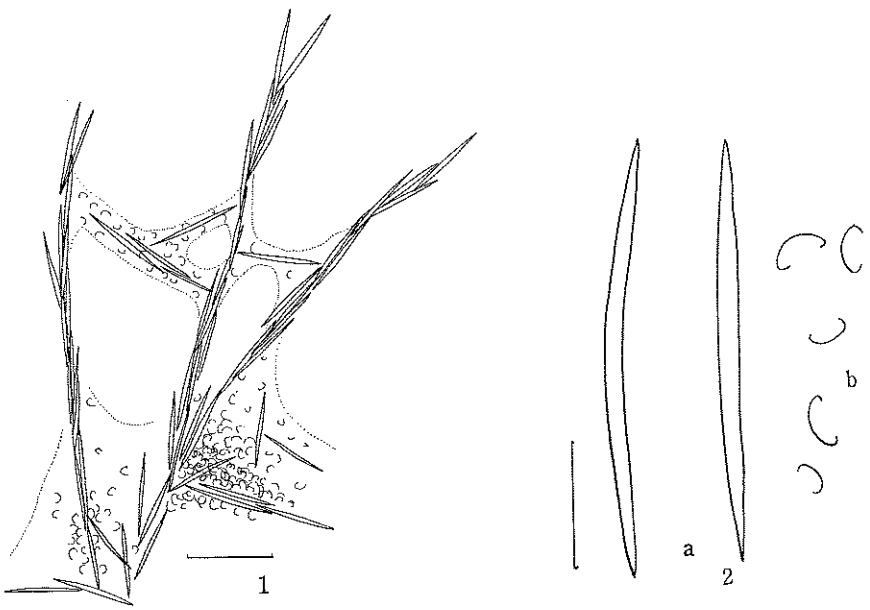


Fig. 44. *Sigmadocia liber* n. sp. (SAT–001–a, Holotype).
1. Portion of skeleton in endosome near surface. Surface: Upper. Scale: 100 μm. 2. Spicule; Oxea (a) and sigmata (b). Scale: 50 μm.

Oxeon — Smooth, slightly arched or slightly bent at the center of the spicule, tapering to a point at each end. Size range 150–164–175 × 6–6.4–8 μm.
Sigma — Very small, thin, C-shaped, smooth, about 15 μm in total length.

Remarks: This species is closely related to *Sigmadocia cymaeformis* (Esper, 1797) that is symbiotic with a certain alga, and is indistinguishable in spiculation. *S. liber* n. sp. differs from *S. cymaeformis* in ecological habitat, being free living. *Sigmadocia symbiotica* Bergquist, 1967 is synonym of *Sigmadocia cymaeformis*.

64. *Sigmadocia strongylatus* (Lindgren, 1897)

Gellius strongylatus Lindgren, 1897, p. 481; 1898, p. 298, Pl. 19, fig. 9 (a–b).

Distribution: In Japan — Hirado Strait.

65. *Sigmadocia vagabunda* (schmidt, 1870)

(Fig. 45; Pl. 5, Fig. 2)

Desmacella vagabunda Schmidt, 1870, p. 53, Pl. 5, fig. 15.
Gellius vagabunda: Vosmaer, 1885, p. 28.
Gellius flagellifer Ridley et Dendy, 1886, p. 333; 1887, p. 42, Pl. 13, figs. 5 and 10; Lambe, 1896, p. 185, Pl. 1, fig. 4, fig. 4 (a–d); Lundbeck, 1902, p. 71, Pl. 2, fig. 9, Pl. 14, fig. 1 (a–d); Dendy, 1921a, p. 26; 1924, p. 320.
Gellius edaphus De Laubenfels, 1930, p. 28; 1932, p. 112, fig. 66.
Gellius porosus: Koltun, 1959, p. 213, Pl. 38, fig. 3, t-fig. 171.
Haliclona flagellifer: Burton, 1959, p. 19.

Material examined: SAT–007–G, Uchinoura, 5–XI–1975.
Dimensions: 3 × 2.5 × 0.3 (thickness) cm.
Habitat: Subtidal zone, on surface of basal part of another sponge, *Myxilla lobatus n. sp.* (SAT–007).
Shape: Thin encrusting sponge.
Color: Pale Cinnamon Pink, 10BB.
Consistency: Fragile, and very soft like a blanket.
Surface: Punctiform, smooth, almost even. Oscules and pores invisible.
Ectosome: No dermal specialization.
Endosome: Subisodictyal reticulation of oxea. Large sigmata hold in the arms single oxeon or several rows of oxea. Small sigmata are found near the tracts of oxea or in the flesh.
Spicule: Oxeon and two kinds of sigma.
Oxeon — Smooth, slightly arched, hastate, with each end sharply pointed. Size range 365–389–435 × 10–12.6–16 μm.
Large Sigma —C-shaped with strongly pronounced curvature. Size range 55–110 μm in distance across, 110–270 μm in length along axis, and 2–3 μm in thickness.
Small Sigma — Normally C-shaped, measuring 40–65 × 1–3 μm.

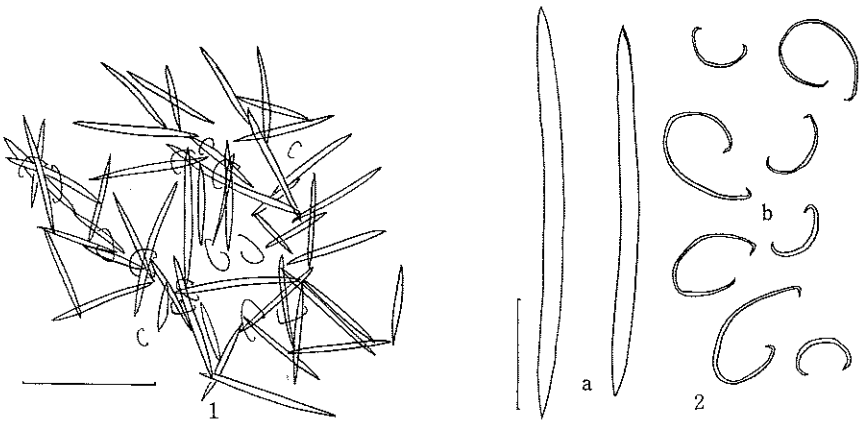


Fig. 45. *Sigmadocia vagabunda* (Schmidt). (SAT–007–G).
1. Portion of skeleton in endosome. Scale: 400 μm. 2. Spicule; Oxea (a) and sigmata (b). Scale: 100 μm.

Distribution: Cosmopolitan
In Japan — Newly recorded.
Remarks: This species has been described as *Gellius flagellifer* by various authors, but the latter is a synonym of *Desmacella vagabunda* Schmidt, 1870. The writer transfers *Desmacella vagabunda* to the genus *Sigmadocia* in this study.

Genus *Toxadocia* De Laubenfels, 1936

66. *Toxadocia cyindrica* Tanita, 1961

Toxadocia cylindrica Tanita, 1961b, p. 135, Pl. 3, figs. 6–7, t-fig. 4.

Distribution: In Japan — Wagu.

67. *Toxadocia shimoebuensis* n. sp.

(Fig. 46; Pl. 5, Fig. 3)

Material examined: SIS–004, Mukaishima, 10–VIII–1969; SIS–093 (Holotype), Shimoebujima, 1–VII–1975.
Dimensions: 9×8×3 (thickness) cm, (SIS–093).
Habitat: Low tide subzone or subtidal zone.
Shape: Irregular massive sponge, with numerous low projections, 3–4 mm high and 1–2 mm wide, on the entire surface. The massive part of the sponge contains foreign materials such as bivalve shells, barnacle shells, or gravel.
Color: Pansy purple 30NF.
Consistency: Very soft.
Surface: Hispid due to projecting primary tracts. Oscules and pores invisible.

Ectosome: No dermal specialization.

Endosome: Coarse and confused arrangement of oxea or irregular subisodictyal reticulation. Vague primary tracts running to the surface in places. Toxa very sparsely scattered.

Spicule: Oxeon and Toxon.

Oxeon — Smooth, straight to slightly bent, both ends sharply pointed. Size range 186–206–226 × 6–8–10 μm (SIS–093).

Toxon — Very thin, slightly or strongly bent at the middle, measuring 55–71–80 × 1–1.3–2 μm (SIS–093).

Note:

	Dimensions of specimen	Spicule measurement
SIS–004	4 × 2 × 5 cm and two fragments	Oxeon, 195–218–240 × 6–8.4–10 Toxon, very rare
SIS–093	9 × 8 × 3 (thickness) cm	Oxeon, 186–206–226 × 6–8–10, Toxon, 55–71–80 × 1–1.3–2

Remarks: This species is characterized by having long oxea, large toxa and by its massive form.

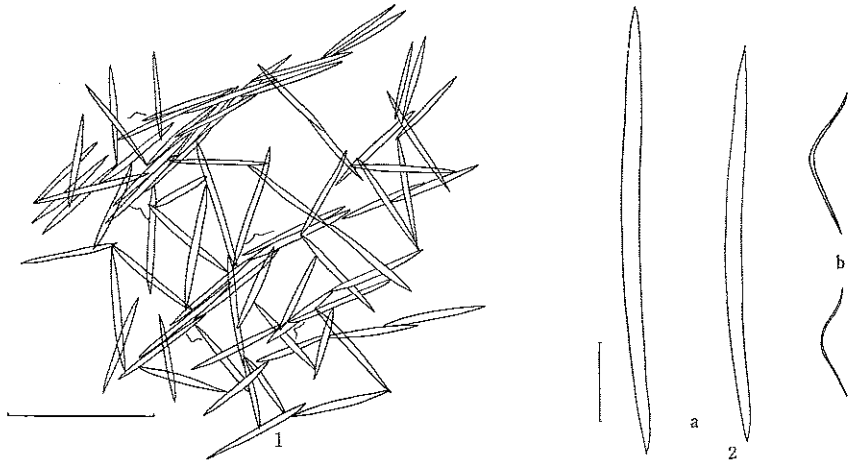


Fig. 46. *Toxadocia shimoebuensis* n. sp. (SIS–093, Holotype).

1. Portion of skeleton in endosome. Scale: 200 μm. 2. Spicule; Oxea (a) and toxa (b). Scale: 50 μm.

Genus *Orina* Gray, 1867

68. *Orina uwaensis* n. sp.

(Fig. 47; Pl. 5, Fig. 4)

Material examined: SAT–007–E (Holotype), Uchinoura, 5–XI–1975.

Dimensions: 4 × 2 × 0.2 (thickness) cm.

Habitat: Subtidal zone, on surface of basal part of another sponge *Myxilla lobatus* n. sp., (SAT–007).

Shape: Very thin encrusting, forming a small patch on the surface of host sponge.

Color: Ivory Buff, 04EB when dry.

Consistency: Very soft to touch like a blanket.

Surface: Oscules and pores invisible.

Ectosome: No dermal specialization.

Endosome: Irregular coarse network of spiculo-fibers, formed from one to ten or more rows of spicules, up to 30 μm in diameter. In the flesh, sigmata and toxa scattered numerously.

Spicule: Oxeon, Toxon, and Sigma.

Oxeon — Smooth, slightly arched, hastate, tapering to point at each end. Size range 150–170–185 × 6–7.6–10 μm.

Toxon — Small, thin, up to 28 μm in length.

Sigma — Small, normally C-shaped, 10–22 μm in length.

Remarks: This species resembles *Gellius dubius* Babic, 1922 in spicule measurement of microscleres, but clearly differs in size of oxeon. Further, this species closely resembles *Gellius petrocalyx* Dendy, 1924, in spiculation, but is easily distinguishable by sponge consistency.

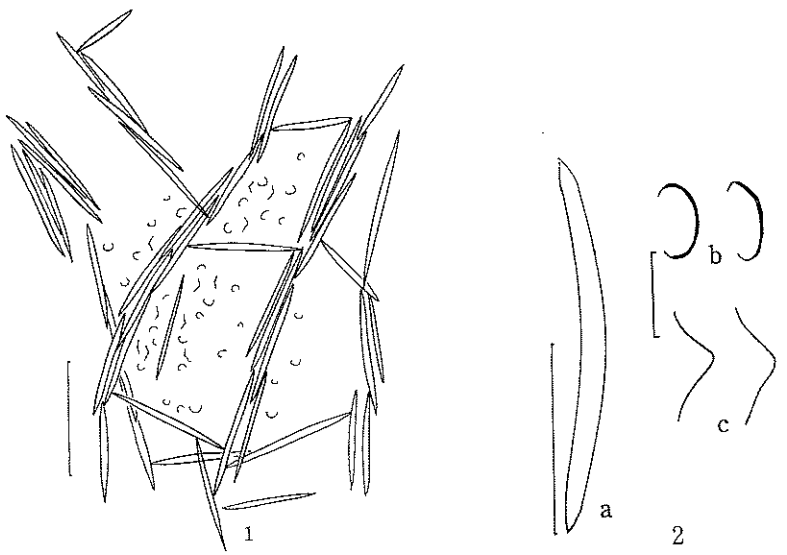


Fig. 47. *Orina uwaensis* n. sp. (SAT–007–E, Holotype).
1. Portion of skeleton in endosome. Scale: 200 μm. 2. Spicule; Oxeon (a), sigmata (b) and toxa (c). Scale: 100 μm (oxeon), 20 μm (sigmata and toxa).

Genus *Biminia* Wiedenmayer, 1977

69. *Biminia ooita* n. sp.

(Fig. 48; Pl. 5, Fig. 5)

Material examined: JAP-030 (Holotype), off Ooita Air Port, 5-XI-1977.

Dimensions: $6 \times 6 \times 4$ (spherical part) cm, 7 (total height) cm.

Habitat: Subtidal zone, 30 m in depth.

Shape: Spherical and massive with several erect hollow cylindrical tubes on surface of upper part of spherical body. These tubes are 0.6–0.8 cm in diameter, 2–4 cm in height, and protrude with 1–2 cm between each other.

Color: Ivory Buff 04EB.

Consistency: Slightly compressible, not especially tough.

Surface: Smooth to touch, even. Oscules, 2.5–3 mm in diameter, open at the tips of each erect cylindrical tube. Pores invisible.

Ectosome: 50–70 μm in thickness. Dense confused arrangement of oxea.

Endosome: Irregular or subisodictyal reticulation. Tracts, densely packed with oxea running parallel to the surface in places. Numerous microscleres scattered in the flesh. Wall of cylindrical tube is formed with isodictyal reticulation of oxea and longitudinal tracts, 30–40 μm in diameter and 250–300 μm apart. Numerous microscleres present.

Spicule: Oxeon, Sigma, and Toxon.

Oxeon — Smooth, hastate, straight to slightly arched, each end sharply pointed. Size range 180–203–218 × 7–8–9 μm.

Sigma — Small, thin, invariably centrangulated, less than 1 μm thick, and 14–35 μm in maximum dimension.

Toxon — Very thin, up to 45 μm long.

Remarks: This species is easily distinguished from other members of the genus *Biminia* by characteristic external form. This is the third species recorded belonging to this genus.

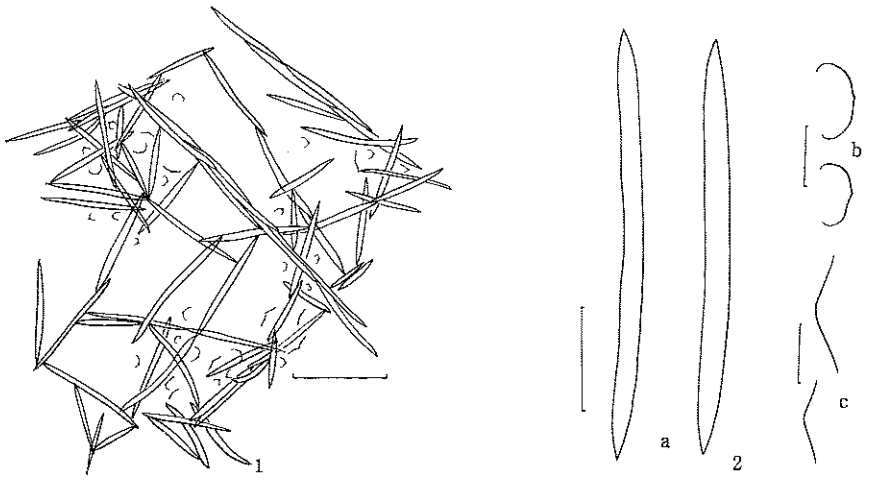


Fig. 48. *Biminia ooita* n. sp. (JAP-030, Holotype).

1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule: Oxea (a), sigmata (b) and toxa (c). Scale: 50 μm (oxea), 20 μm (sigmata and toxa).

Genus *Pellina* Schmidt, 1862

70. *Pellina toxonisimilis* n. sp.

(Fig. 49; Pl. 5, Fig. 6)

Material examined: MIT–007 (Holotype), MIT–018, MIT–030, MIT–050, MIT–092, Mitsukue, 5–XI–1975; SAT–006–a, Uchinoura, 5–XI–1975.

Dimensions: $3 \times 8 \times 6$ (height) cm, (MIT–007).

Habitat: Subtidal zone, 15 m in depth, on rocky substrate.

Shape: This sponge is composed of a massive part and hollow cylindrical tubes. Many tubes are developed from massive part, and are nearly upright, 0.5–1 cm in diameter, with walls 1–2 mm thick. Several of these fuse with neighboring tubes at some portions. Several portions of the massive part undersurface attach to stone or rocky substrate.

Color: Pinkish Cinnamon 08GB or Ochraceous Salmon 12GB.

Consistency: Slightly compressible, but hard when dry.

Surface: Smooth to touch, finely wrinkled in some places. Pores 0.1–0.2 mm

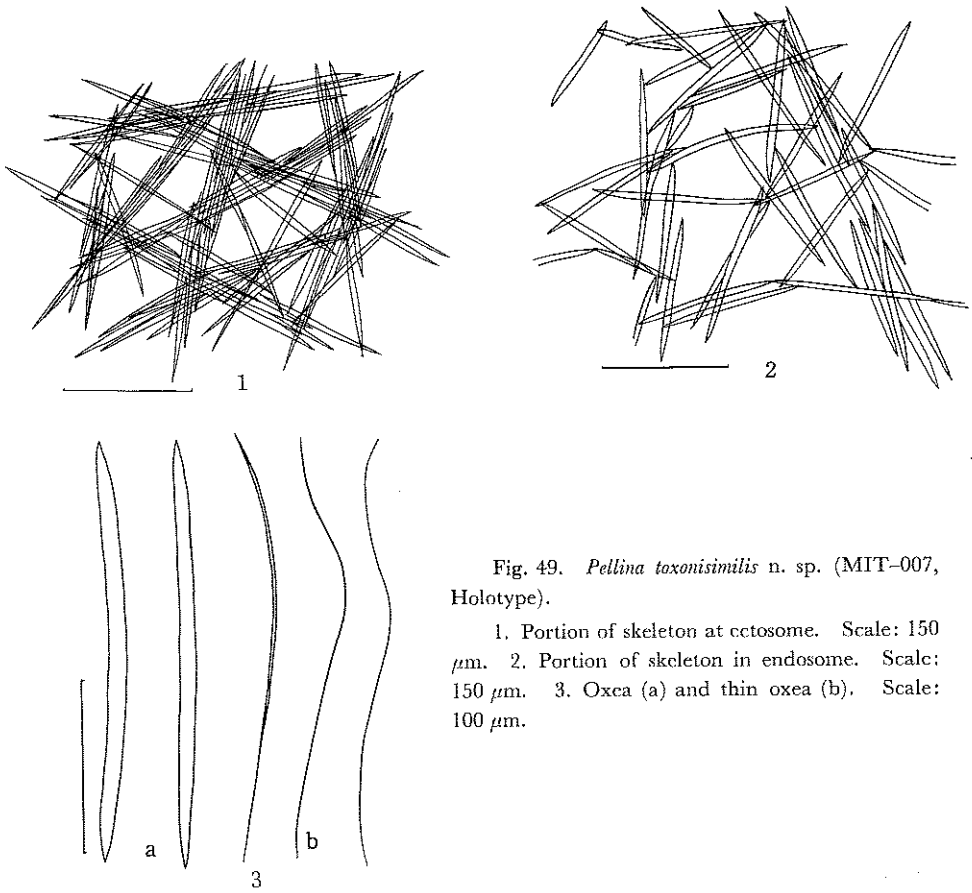


Fig. 49. *Pellina toxonisimilis* n. sp. (MIT–007, Holotype).

1. Portion of skeleton at ectosome. Scale: 150 μm. 2. Portion of skeleton in endosome. Scale: 150 μm. 3. Oxea (a) and thin oxea (b). Scale: 100 μm.

in diameter, scattered in places. Oscules open exclusively at summits of cylindrical tubes.

Ectosome: Regularly reticulated with spicule tracts running in three directions. The meshes are about 50 μm in diameter. The tracts are 30–50 μm in diameter and contain more than ten rows of spicules.

Endosome: Irregular subisodictyal reticulation or irregular reticulation, and vague tracts in places, with a few rows of spicules, ascending to surface.

Spicule: Oxeon and Thin Oxeon like Toxon.

Oxeon — Smooth, straight, or occasionally slightly arched, hastate, each end sharply pointed. Size range 225–245–265 × 6–7.2–9 μm (MIT–007).

Thin oxeon — Like toxon, very thin, slightly sinuous or bent at the middle or slightly arched, measuring 180–200 × 1 μm (MIT–007).

Note:

	Dimensions of specimen	Spicule measurements	
		Oxeon	Thin Oxeon
MIT–007	3 × 8 × 6 cm	225–245–265 × 6–7.2–9	180–200 × 1
MIT–018	1 × 1 × 10	180–248–300 × 6–8.5–12	180–200 × 1
MIT–030	3 × 1 × 1 and 2 × 1 × 1	190–236–265 × 5–6–8	180–200 × 1
MIT–050	5 × 6 × 6	230–265–315 × 8–9–10	very rare
MIT–092	5 × 7 × 3	205–271–320 × 7–8.4–10	very rare
SAT–006–a	1 × 1 × 2	220–271–308 × 6–8–11	very rare

Remarks: This species is characterized by its external morphology with hollow exhallent chimneys, and by having thin oxea like toxa.

Genus *Petrosia* Vosmaer, 1887

71. *Petrosia solida* n. sp.

(Fig. 50; Pl. 5, Fig. 7)

Material examined: SAT–044 (Holotype), SAT–075, Uchinoura, 5–XI–1975.

Dimensions: 4 × 2 × 2 cm, (SAT–044).

Habitat: Subtidal zone, 15 m in depth, on rocky substrate.

Shape: Spheroid or distorted spherical sponge, with a few oscules, 0.4–1.0 cm in diameter, at the summits of body.

Color: Ivory Buff 04EB or Maple 07GD when dry.

Consistency: Very hard, stone-like.

Surface: Smooth, but very slightly, irregularly undulated, with swelling a few millimeters in height and a few centimeters apart. A few oscules at summit. Pores invisible.

Ectosome: Horizontal, irregular reticulation of tracts of strongyles, which

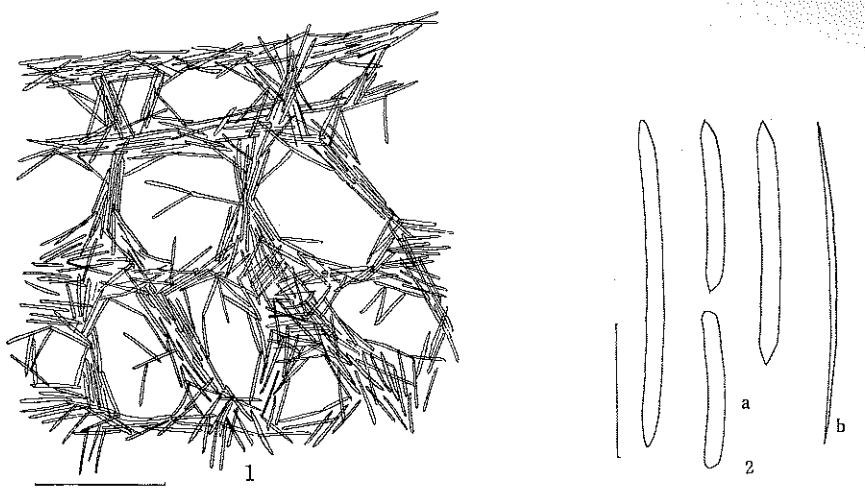


Fig. 50. *Petrosia solida* n. sp. (SAT–044, Holotype).
1. Portion of skeleton in endosome beneath ectosome Ectosome: Upper Scale: 500 μm
2. Spicule; Strongyles (a) and Oxeon (b). Scale: 100 μm.

are 30–200 μm in diameter.

Endosome: Typical structure of the genus *Petrosia*. Secondary tracts run parallel to surface and each other, and near the surface, the primary tracts regularly connect these secondary tracts. Most of the deep part, however, changes to a confused arrangement of vague spicule tracts.

Spicule: Strongyle and Oxeon.

Strongyle — Smooth, slightly arched, each end blunt or occasionally pointed. Size range 75–265×6–12 μm, but segregated into apparent size categories as follows: 200–241–265×9–11–12 μm and 75–96–135×6–7.6–10 μm (SAT–044).

Oxeon — Very thin or thin, sharply pointed at each end. Size range 230×3 to 260×6 μm. Not abundant.

Note:

	Dimensions of specimen	Spicule measurements	
		Strongyle	Oxeon
SAT–044	4×2×2 cm	200–241–265×9–11–12, 75–96–135×6–7.6–10	230×3 to 260×6
SAT–075	8×5×5	60×8 to 260×12	140–209–240×2–3–5

Remarks: This species is characterized by having strongyles and thin oxea as spicules.

72. *Petrosia solusstrongyla* n. sp.

(Fig. 51; Pl. 5, Fig. 8)

Material examined: SAT–023 (Holotype), SAT–062, Uchinoura, 5–XI–1975.

Dimensions: $7 \times 7 \times 12$ (height) cm, (SAT–023).

Habitat: Subtidal zone, 15 m in depth.

Shape: Massive, spheroid or erect ellipsoid sponge, developed on stone, with single oscule, 1–1.2 cm in diameter, at the summit.

Color: Light Brown Drab 18ED.

Consistency: Very Hard, stone-like.

Surface: Smooth to touch, uneven. Single oscule at the summit. Pores microscopic.

Ectosome: Irregular horizontal reticulation of vague tracts or distinct tracts, of 70–90 μm in diameter. Meshes of reticulation are 100–250 μm in maximum dimension.

Endosome: Typical arrangement of spicule tracts in the genus *Petrosia*. Regular reticulation of primary and secondary tracts throughout most of sponge, and confused arrangement of spicules in certain parts. Primary tracts are 100–150 μm, and the secondary about 100 μm in diameter, and meshes 80–150 μm in maximum dimension.

Spicule: Strongyle only — Widely variable in form and size. Smooth, straight to gently curved or strongly bent, nearly consistant width throughout length, with each end rounded or occasionally slightly pointed, varying 60×5 to 270×11 μm (SAT–023).

Note:

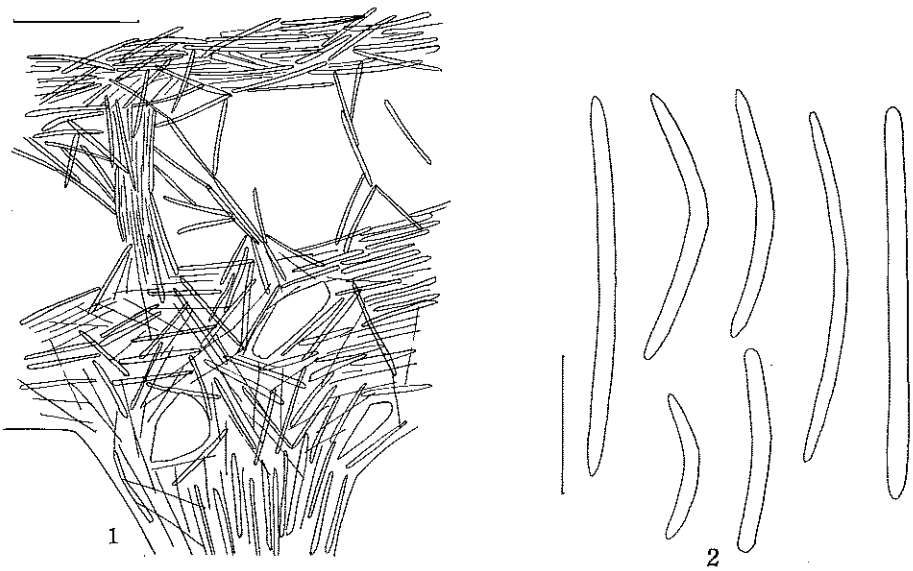


Fig. 51. *Petrosia solusstrongyla* n. sp. (SAT–023, Holotype).

1. Portion of skeleton in endosome beneath ectosome. Scale: 500 μm. 2. Spicule; Strongyles. Scale: 100 μm.

	Dimensions of specimen	Spicule measurements
		Strongyle
SAT–023	7×7×12 cm	60×5 to 270×11
SAT–062	3×4×7	65×4 to 270×12

Remarks: This species is characterized by having spiculation consisting only of strongyles. *Petrosia strongylata* Thiele, 1903 differs from this species in having strongyles of variable size plus small oxea.

73. *Petrosia spheroida* Tanita, 1967

Petrosia spheroida Tanita, 1967, p. 115, Pl. 1, fig. 5, t-fig. 1; Hoshino, 1975a, p. 32, Pl. 3, fig. 3

Distribution: In Japan — Kasumi; Shishikui.

74. *Petrosia ushitsuensis* Tanita, 1963

(Fig. 52)

Petrosia ushitsuensis Tanita, 1963, p. 122, Pl. 4, fig. 1, t-fig. 1; 1965a, p. 47, Pl. 1, fig. 4; 1967, p. 115, Pl. 1, fig. 4; Hoshino, 1975a, p. 32, Pl. 4, fig. 1; 1975c, p. 18, Pl. 1, figs. 5–6.

Material examined: MIT–019, Mitsukue, 5–XI–1975; JAP–008, Tokushima, 26–X–1976 (Mr. Komatsu leg.).

Dimensions: 8×4×1 cm, (MIT–019).

Habitat: Subtidal zone, 15 m in depth.

Shape: Irregular board-like sponge.

Color: Vernonia Purple 30IF.

Consistency: Hard and stony.

Surface: Smooth to touch, uneven. Oscules, 0.1–2 mm in diameter, open in places on front surface. Pores invisible.

Ectosome: 50 μm thick. A confused reticulation of slender oxea arranged almost tangentally, with numerous short oxea protruding on and between these reticulations.

Endosome: Typical reticulation of thick tracts in the genus *Petrosia*. These thick tracts are composed mainly of stout oxea, with other accessory spicules.

Spicule: Three categories of Oxeon and Strongyle.

Stout Oxeon — Main spicule in tracts of endosome. Smooth, slightly arched of similar width throughout length, abruptly tapered near each end, not sharply pointed but rounded. Size range 180–287–315×11–16–20 μm (MIT–019).

Slender Oxeon — Spicule in ectosome, and occasionally in endosome tracts. Smooth, slightly arched, of similar width throughout most of its length, and tapering to a point at each end. Size range 100–151–190×5–6–7 μm (MIT–019).

Short Oxeon — Protruding spicule at ectosome. Smooth, slightly arched, tapering from middle to a point at each end. Size range 50–55–70×3–3.5–4 μm

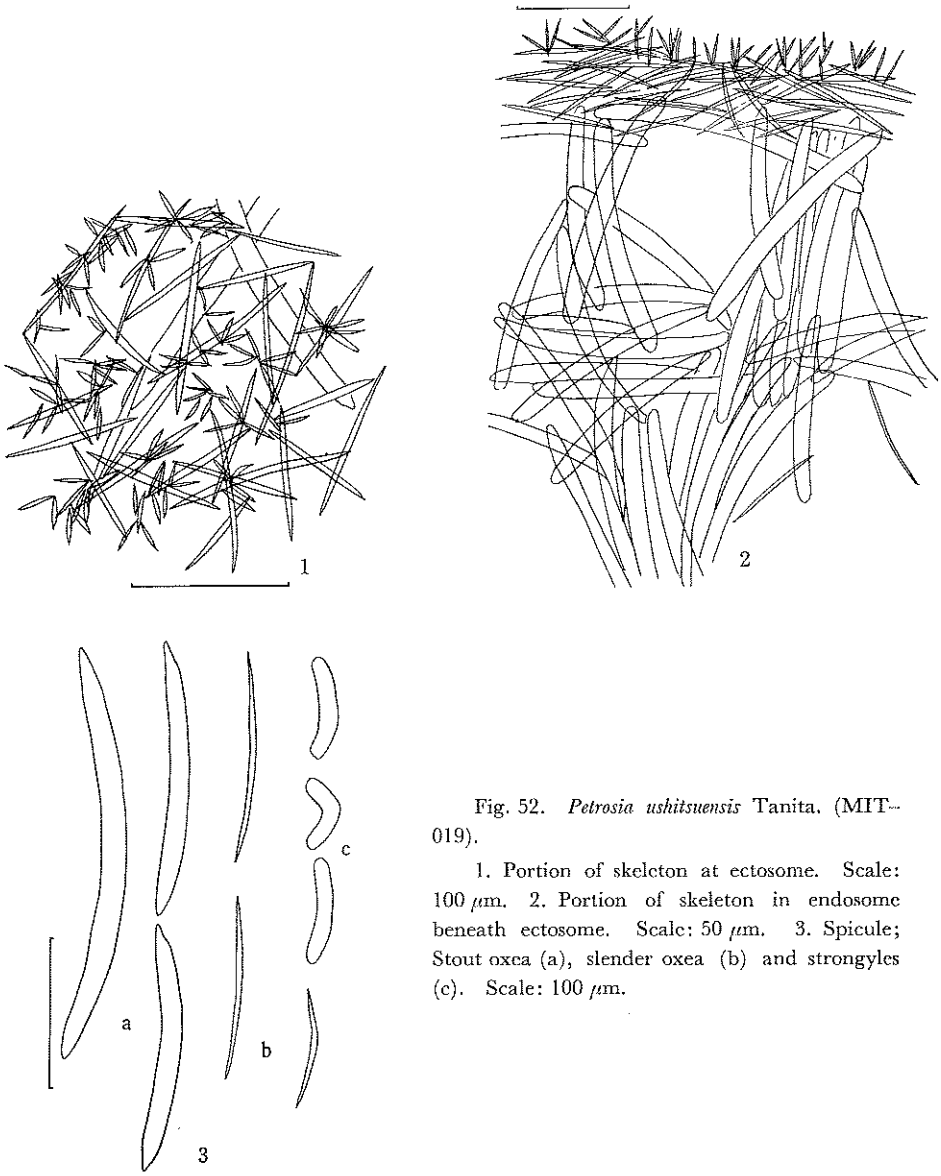


Fig. 52. *Petrosia ushitsuensis* Tanita. (MIT–019).

1. Portion of skelcton at ectosome. Scale: 100 μm. 2. Portion of skeleton in endosome beneath ectosome. Scale: 50 μm. 3. Spicule; Stout oxea (a), slender oxea (b) and strongyles (c). Scale: 100 μm.

(MIT–019).

Strongyle — Short, stout, bean-shapcd, straight or slightly arched or strongly bent, varying in size 60×18 to 30×7 μm (MIT–019).

Spicules in the species vary greatly in form and size; therefore it is difficult to classify each spicule to one of the four kinds of spicules described above. Numerous intermediate spicule forms and sizes were observed.

Distribution: In Japan — Sea of Japan; Hiwasa.

Note:

	Dimensions of specimen	Spicule measurements
		Stout Oxeon
MIT–019	8×4×1 (thickness) cm	180–287–315×11–16–20
JAP–008	7×2.5×9	115–221–295×10–12–16

Spicule measurements		
Slender Oxeon	Short Oxeon	Strongyle
100–151–190×5–6–7	50–55–70×3–3.5–4	60×18 to 30×7
70–163–200×2–5–8	45–65–75×3–3.5–4	90×13 to 40×6

75. *Petrosia volcano* Hoshino, 1976

Petrosia volcano Hoshino, 1976a, p. 251, Pl.2, figs. 12–14.

Distribution: In Japan — Shirahama.

Genus *Strongylophora* Dendy, 1905

76. *Strongylophora corticata* Wilson, 1925

Strongylophora corticata Wilson, 1925, p. 392, Pl. 40, fig. 7, Pl. 48, figs. 2 and 7; Tanita, 1970a, p. 89, Pl. 2, fig. 7, t-fig. 1; 1975, p. 32, Pl. 2, fig.7; 1977, p. 36, Pl. 2, fig. 7, t-fig. 4; Hoshino, 1976a, p. 250, Pl. 1, figs. 2–3.

Distribution: Philippine.
In Japan — Sagami Bay; Kii Peninsula; Hiwasa.

Family Coaclosphaeridae Hentschel, 1923

Genus *Coelosphaera* Thomson, 1873

77. *Coelosphaera calcifera* (Burton, 1934)

(Fig. 53)

Histoderma calcifera Burton, 1934b, p. 548, t-fig. 8.
Coalosphaera calcifera: Hoshino, 1976c, p. 5, Pl. 2, figs. 13–16.

Material examined: AR–1–1, AR–1–2, AR–1–3, AR–1–4, AR–1–5, AR–1–23, AR–1–25, AR–1–26, AR–1–27, AR–1–28, Ariake Sea (near Aitsu M.B.S.), 16–V–1972.

Dimensions: 3×3×4 cm (AR–1–1), each specimen similar to this size.

Habitat: Subtidal zone, 20 m in depth, on carbonate bottom.

Shape: Irregular, massive sponge, with irregular, not well developed, upright chimneys. Sponge body contains numerous calcareous substances (shell fragment and so forth) either within the sponge or adhering to the surface.

Color: Chrominum Green 92JE or Gray.

Consistency: Slightly compressible and fragile.

Surface: Rough to touch, sponge surface hidden by calcareous substances. Oscules open at summit of rpright chimneys. Pores invisible.

Ectosome: Confused, horizontal arrangement of tylotes.

Endosome: Irregular reticulation of vague tracts of tylotes. Tracts branch out as they ascend. Microscleres are found in the flesh.

Spicule: Tylote; Sigma and Isochela.

Tylote — Smooth, nearly straight, slightly tapering from one end to the another, with each end swollen. Size range 230–267–305 × 5–8–10 μm (AR–1–1).

Sigma — Two size modes, C- or S-shaped, measuring about 20 μm and 32–42 μm in maximum length (AR–1–1).

Isochela — Arcuate type, measuring 25–30 μm in maximum length (AR–171).

Distribution: Australia.

In Japan — Ariake Sea.

Remarks: This species was originally placed in the genus *Histoderma*, but is transfered to the genus *Coelosphaera* in this study.

Group Plocamiiformes De Laubenfels, 1936

Family Plocamiidae Topsent, 1928

Genus *Lissoplocamia* Brøndsted, 1924

78. *Lissoplocamia tokushima* Tanita, 1970

Lissoplocamia tokushima Tanita, 1970b, p. 101, Pl. 1, fig. 6, Pl. 2, fig. 7, t-fig. 1; Hoshino, 1975a, p. 32, Pl. 2, fig. 4.

Distribution: In Japan—Yuki; Hiwasa.

Group Myxilliformes De Laubenfels, 1936

Family Myxillidae Hentschel, 1923

Genus *Myxilla* Schmidt, 1862

79. *Myxilla bivalvia* Tanita, 1967

Myxilla bivalvia Tanita, 1967, p. 115, Pl. 2, fig. 6, t-fig. 2.

Distribution: In Japan — Kasumi.

80. *Myxilla behringensis* Lambe, 1895

(Fig. 54)

Myxilla behringensis Lambe, 1895, p. 121, Pl. 3, figs. 3 and 3(a–f); Hentschel, 1929, p. 945.
Myxilla incrustans behringensis: Koltun, 1958, p. 56; 1959, p. 110, t-fig. 63.

Material examined: SAT–039, SAT–063–1, SAT–076, Uchinoura, 5–XI–1975.

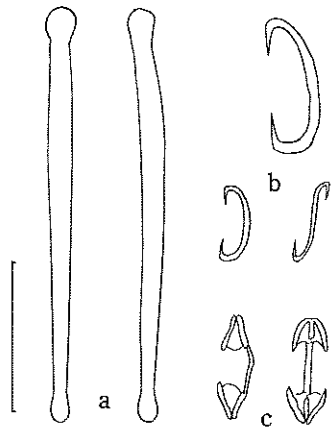


Fig. 53. *Coelosphaera calcifera* (Burton). (AR–1–1).

Spicule; Tylotes (a), sigmata (b) and isochelae (c). Scale: 50 μm.

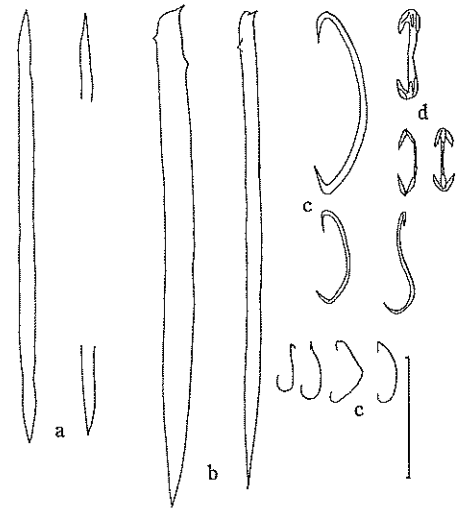


Fig. 54. *Myxilla behringensis* Lambe. (SAT–039).

Spicule; Tornotes (a), acanthostyles (b), sigmata (c) and isochelae (d). Scale: 50 μm.

Dimensions: $10 \times 5 \times 3$ (height) cm, (SAT–039).

Habitat: Subtidal zone, 10–20 m in depth.

Shape: Thin encrusting, less than 1 cm thick, or irregular massive sponge, with several upright chimneys, 1.5–2 cm in height and 0.7–1.5 cm in diameter, or in some instances lacking chimneys.

Color: Light Brown Drab 18ED or Maple 07GD.

Consistency: Hard and tough, but occasionally fragile.

Surface: Smooth, porous. Pores varying greatly in size, 0.3–1.0 cm, and distributed over entire surface. Oscules open at top of each chimney.

Ectosome: Reticulation of tornote tracts, 60–330 μm in diameter, but confused arrangement of tornotes in places.

Endosome: Comparatively well developed isodictyal reticulation of acanthostyle tracts, made up of several tens of rows of spicules, and measuring 40–120 μm in diameter. Length of the sides of isodictyal meshes are equal to spicule length, 150–250 μm. Numerous microscleres exist at neighboring tracts and also in the flesh.

Spicule: Tornote; Acanthostyle; Three categories of Sigma; and Two kinds of Isochela.

Tornote — Smooth, straight or nearly straight, slightly tapering from one end to the another, with each end abruptly pointed. Most spicules slightly constricted near one or both ends. Size range $160–173–190 \times 5–6–7$ μm (SAT–039).

Acanthostyle — Straight or nearly straight or slightly arched, with a few to several blunt spines at base, or in some instances, entirely smooth. Size range $230–244–256 \times 6–12–15$ μm (SAT–039). Juveniles are more slender.

Sigma — Generally C-shaped and occasionally S-shaped. Three size modes are found. 80–95×4–5 μm, 40–50×2–3 μm, and ca. 15×1–2 μm (SAT–039).
Isochela — Anchorate type, two size modes, 15 μm and 30–35 μm in length (SAT–039).

Distribution: Behring Sea; North Pacific; Okhotsk Sea.

In Japan — Sea of Japan.

Note:

	Dimensions of specimen	Spicule measurements
		Tornote
SAT–039	10×5×3 cm (thin encrusting)	160–173–190×5–6–7
SAT–063–1	4×3×2 cm (massive)	170–173–176×5–6–8
SAT–076	8×4×4 cm (massive)	160–165–170×4–5–6

Spicule measurements		
Acanthostyle	Sigma	Isochela
230–244–256×6–12–15	80–95×4–5, 40–50×2–3, ca. 15×1–2	30–35 and 15 (length)
190–244–256×10–12–14	80–85×4–5, 40–50×2–3, 15×1	45 and 16
195–226–248×9–10–11	70–80×5, 40–50×3, 20–25×1	30–45 and 15

Remarks: Koltun (1959) placed this species in one of the subspecies of *Myxilla incrustans* on the basis of its isodictyal reticulation, but it is clearly distinguishable from any of the other subspecies cited by Koltun (1959). The writer feels that it is better to establish a subgenus for those members of the genus *Myxilla* which have isodictyal reticulation.

81. *Myxilla hiradoensis* new name

Dendoryx mollis Lindgren, 1897, p. 482; 1898, p. 305, Pl. 18, figs. 3 and 12, Pl. 19, fig. 14 (a–c, c′).

Distribution: In Japan — Hirado Strait.

Remarks: Since the genus *Dendoryx* is a synonym of the genus *Myxilla*, and *Myxilla mollis* was preoccupied by Ridley and Dendy (1886, p. 471) from Patagonia, the writer gives the new name *Myxilla hiradoensis* to this species.

82. *Myxilla incrustans* (Johnston, 1842)

(Fig. 55)

Halichondria incrustans Johnston, 1842, p. 122, Pl. 12, fig. 3, Pl. 13, fig. 5.

Myxilla incrustans: Burton, 1935a, p. 70; 1959, p. 27; Tanita, 1968, p. 45, t-fig. 5; 1970a, p. 89, Pl. 2, fig. 8; 1978, p. 231; Rho *et al*, 1969, p. 157, Pl. 2, figs. 9–10, t-fig. 3; Hoshino, 1971, p. 24; 1976c, p. 5, Pl. 1, fig. 9.

Myxilla incrustans incrustans: Koltun, 1959, p. 109, t-fig. 61, Pl. 13, fig. 4; 1962b, p. 190.

Material examined: SIS–025, Mukaishima, 20–II–1970; SIS–053, Shijushima, 24–V–1071; SIS–056, Onomichi Channel, 29–I–1972; SIS–068, Kamiebushima, 24–VI–1972; SIS–081, Mukaishima, 25–VIII–1969; SIS–112, Shijushima, 24–V–1975; SIS–155, Sasajima, 21–I–1976, SIS–156, Mukaishima, 21–I–1976; SAT–054, Uchinoura, 5–XI–1975, JAP–032, Awajishima, 5–VI–1977.

Dimensions: $3 \times 4 \times 6$ (Height) cm, (SIS–025).

Habitat: Intertidal or subtidal zone, on rocky substrate.

Shape: Irregular massive, or ramose, or thin encrusting. On ramose sponge, branches may or not be compressed.

Color: Burnt Orange 16PA, Apricot Orange 16HB or Vinaceous Cinnamon 15GC.

Consistency: Elastic or compressible, tough or not tough.

Surface: Minutely conulose and wrinkled on massive sponge, uneven due to numerous protrusions; irregularly porous in places on encrusting sponge; and weakly wrinkled on ramose sponge. Oscules and pores invisible.

Ectosome: Coarse, horizontal, irregular arrangement of tornotes on massive sponge, or on ramose sponge, tornotes perpendicularly expand from the end of tracts of isodictyal reticulation of endosome, with fleshy dermis.

Endosome: Rigid, isodictyal reticulation of acanthostyles, and latera form bundles of one to five spicules. Numerous sigmata and isochelae are found in the flesh or near reticulated bundles.

Spicule: Tornote; Acanthostyle; Sigma; and Isochela.

Tornote — Smooth, nearly straight, or slightly arched or slightly sinuous, nearly equal in width throughout length or slightly tapering from middle to each end, with both ends abruptly pointed or occasionally slightly swollen, and pointed with slightly thinned neck. Size range 100–139–147 × 3–5–6 μm (SIS–025).

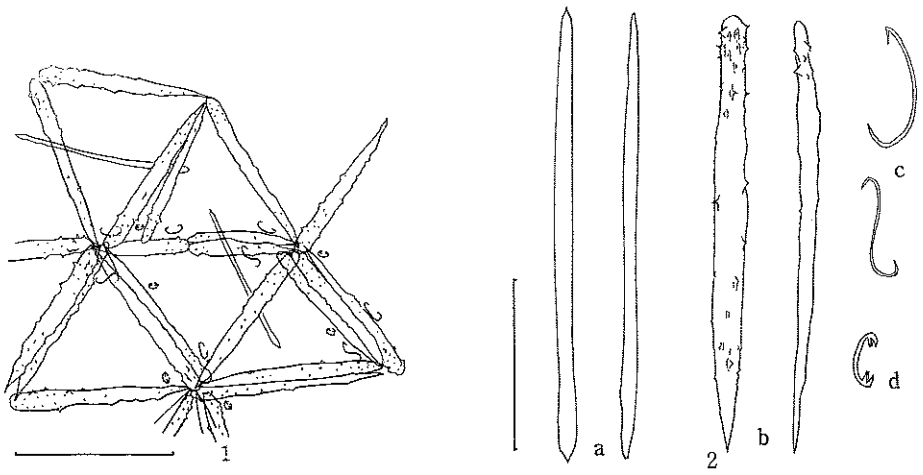


Fig. 55. *Myxilla incrustans* (Johnston). (SIS–025).

1. Portion of skeleton in endosome. Scale: 150 μm. 2. Spicule; Tornotes (a), acanthostyles (b), sigmata (c) and isochela (d). Scale: 50 μm.

Acanthostyle — Straight or slightly arched, nearly equal in width throughout length, with sharply pointed ends, sharply and coarsely spinned throughout entire length. Size range 135–147–150×6–8–10 μm (SIS–025).
Sigma — Normaly C-shaped or occasionally S-shaped, 45 μm across (SIS–025).
Isochela — Tridentate, 15 μm in length (SIS–025).

Distribution: Cosmopolitan

In Japan — Sea of Japan; Sagami Bay; Ariake Sea.

Note: Spherical larvae of 150–200 μm in diameter were found in the flesh of JAP–032. Dimensions, external form and spicule measurements of representative specimens are as follows:

	Dimensions of specimen	External form	Spicule measurements
			Tornote
SIS–025	3×4×6 cm	irregular massive	100–139–155×3–5–6
SIS–056	3×4×8	ramose	165–176–185×6–7–8
SIS–081	5×5×0.3	thin encrusting	144–157–166×3–5–7
SIS–112	5×4×2	thick encrusting	125–148–168–4–6–8
SAT–054	12×8×4	irregular massive	155–165–185×6–8–9
JAP–032	8×6×5	massive	125–144–162×6–7–8

Spicule measurements		
Acanthostyle	Sigma	Isochela
135–147–150×6–8–10	45	15
145–160–170×10–11–12	40–50	15–25
135–143–150×6–8–11	15–45	15–25
132–149–160×9–11–12	14–23	18–45
145–152–166×9–10–12	20–40	11–23
132–138–145×8–9.9–12	15–50	15–25

Remarks: This species a common species of the genus *Myxilla* having isodictyal reticulation.

83. *Myxilla lobatus* n. sp.

(Fig. 56; Pl. 6, Fig. 1; Pl. 9, Figs. 1–3)

Material examined: MIT–015 (Holotype), MIT–055, MIT–056, MIT–059, MIT–071, Mitsukue, 5–XI–1975; SAT–003, SAT–004, SAT–005, SAT–006, SAT–007, SAT–008, SAT–009, SAT–010, SAT–011, SAT–012, SAT–033, SAT–036, SAT–045, SAT–052, SAT–055, Uchinoura, 5–XI–1975.

Dimensions: 7×14×9 (height) cm, (MIT–015).

Habitat: Subtidal zone, 15–20 m in depth, on rocky substrate.

Shape: Irregular, massive sponge, consisting of numerous erect, compressed, or cylindrical lobes, growing from a basal part attached to a stone surface.

Color: Red Orange 22OA on apical part of each lobe, and Isabella Color 05GC on other part. Or Eugenia Red 25LA on entire sponge.

Consistency: Very tough, slightly compressible.

Surface: Smooth to touch, uneven. Pores invisible. Oscules 1–2 mm in diameter are found on the tops and side surfaces of several lobes.

Ectosome: 50–70 μm in thickness, formed by brushes of tylotes at the tips of ascending tracts from endosome and by coarsely and horizontally arranged tylotes in fleshy dermis. Numerous isochelae are found in fleshy dermis.

Endosome: Reticulation of well developed ascending tracts, which contain long acanthostyles and echinate stout acanthostyles. These tracts are 50–120 μm in thickness, and 50–200 μm apart. Numerous sigmata and birotulates are found in flesh or near tracts. Thin acanthostyles are found coarsely in the flesh.

Spicule: Tornote; Three categories of Acanthostyle; Sigma; and Birotulate.

Tornote — Smooth, nearly straight, abruptly pointed at each end, slightly tapering to each end, with six to nine spinules at tip of each end. Size range 135–163–183 × 5–6–9 μm (MIT–015).

Stout Acanthostyle — Straight or slightly arched, roughly spined throughout entire length, and especially large-spined on base of spicules. Size range 160–187–210 × 9–11–12 μm (MIT–015).

Slender Acanthostyle — Slender, straight or slightly bent near base or slightly arched and coarsely spined throughout entire length. Size range 175–187–215 × 5–6.5–9 μm (MIT–015).

Short Acanthostyle — Straight, spined throughout entire length. Size range 90–105–115 × 9–9.6–11 μm (MIT–015).

Sigma — Smooth, C-shaped, measuring 40–50 μm across and about 2 μm in thickness (MIT–015).

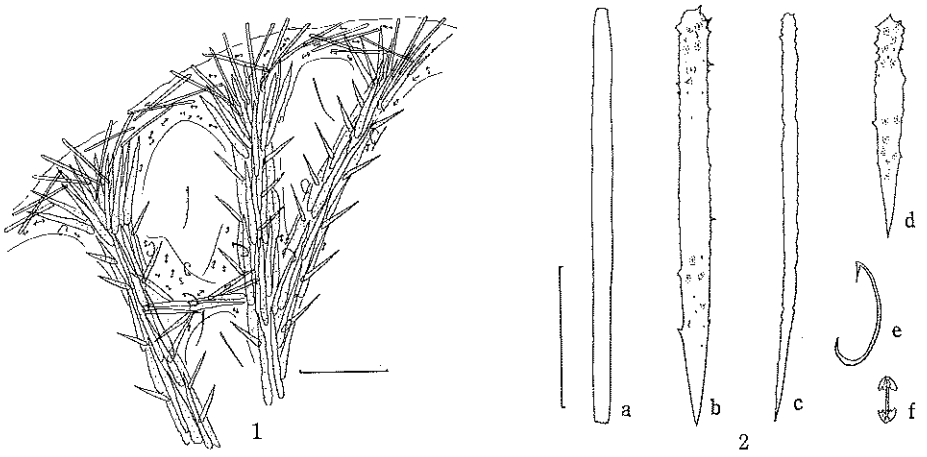


Fig. 56. *Myxilla lobatus* n. sp. (MIT–015, Holotype).

1. Portion of skeleton in endosome beneath ectosome. Scale: 200 μm. 2. Spicule; Tornote (a), stout acanthostyle (b), slender acanthostyle (c), short acanthostyle (d), sigma (e) and birotulate (f). Scale: 50 μm.

Birotulate — Duodecimdentate, 15 μm in length, discs with tweleve wings 3 μm in diameter at each end (MIT-015).

Role of macrosclere in skeleton: Stout acanthostyle — Mainly in core of tracts, occasionally echinating from tracts. Slender acanthostyle — Mainly in core of tracts, occasionally echinating from tracts. Short acanthostyle — Echinating from tracts.

Note: Dimensions and spicule measurements of representative specimens are as follows:

	Dimensions of specimen	Spiculc measurements	
		Tornote	Stout Acanthostyle
MIT-015	7×14×9 cm	135–163–183×5–6–9	160–187–210×9–11–12
MIT-059	3×10×13	155–171–190×5–6–7	173–195–200×12–13–14
SAT-003	7×13×11	145–167–180×4–5.6–7	186–202–230×10–11–12
SAT-007	16×10×15	178–184–194×4–5.6–8	175–201–215×11–13–15
SAT-012	19×8×13	163–171–180×5–6.4–7	173–183–198×10–12–13
SAT-055	17×8×15	176–189–206×6–6.5–7	172–207–220×9–11–12

Spicule measurements			
Slender Acanthostyle	Short Acanthsotyle	Sigma	Birotulate
175–187–215×5–6.5–9	90–105–115×9–9.6–11	40–50×2	15×3
165–188–210×6–8.6–11	105–110–115×8–9.8–12	50–55	15
160–180–205×7–8.5–11	91–112–123×8–9–10	45–50×4	15
170–190–220×3–7–10	78–115–130×8–10–11	45–55×4	15
165–177–195×6–7.3–10	95–111–125×8–9.5–11	45–55	15
very rare	90–109–125×6–9–11	45–55	15

Remarks: This species closely resembles *Myxilla productus* n. sp. (described later) in spiculation but differs in having no palmate isochelae and in external form.

84. *Myxilla parasitica* Lambe, 1893

(Fig. 57)

Myxilla parasitica Lambe, 1893, p. 31, Pl. 2, figs. 8 and 8(a–f); 1895, p. 121; Koltun, 1959, p. 112, t-fig. 65, Pl. 13, fig. 3; 1962b, p. 191; De Laubenfels, 1932, p. 80, fig. 45.
Ectyomyxilla parasitica: Hentschel. 1929. p. 948.
Ectyodoryx parasitica: De Laubenfels, 1936a, p. 84; 1961, p. 197.
Myxilla sp. Hoshino, 1975c, p. 18, Pl. 2, figs. 8–10.

Material examined: SIS-086, Mukaishima, 24-VI-1972.
Dimensions: 9×7×18 (height) cm.
Habitat: Subtidal zone, 5 m in depth.
Shape: Erect, irregular lobate sponge. The largest lobe is 9 cm wide,

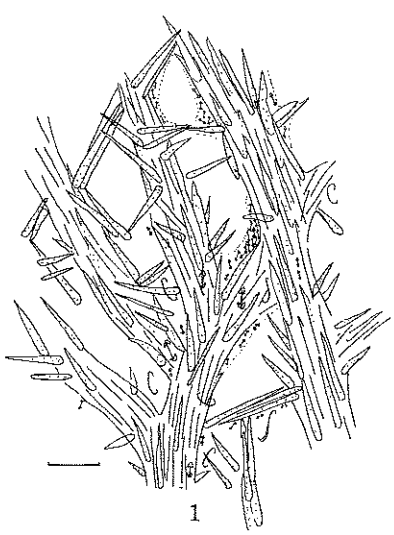
1–1.5 cm thick, and reaches 18 cm in total height from base. Several small lobes or branches develop from lower part of sponge.

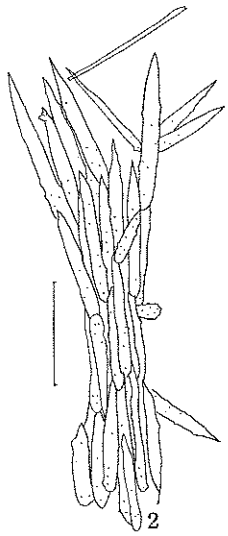
Color: Ivory Buff 04EB.

Consistency: Slightly compressible, very tough.

Surface: Smooth to touch, even. Several oscules, 2–2.5 mm in diameter, open on side surface. Pores indistinct, but surface appears, as mesh, covered with irregular holes 0.1–0.3 mm in maximum demension. Surface is slightly swollen in places and from these summits, several canals 2–3 mm wide, 2–3 cm long and ca. 1 mm deep, radiate and run irregularly.

Ectosome and Endosome: Irregular reticulation of well developed ascending tracts only, mostly densely packed with long acanthostyles and with echinating short acanthostyles. Secondary tracts are weakly developed in places. These





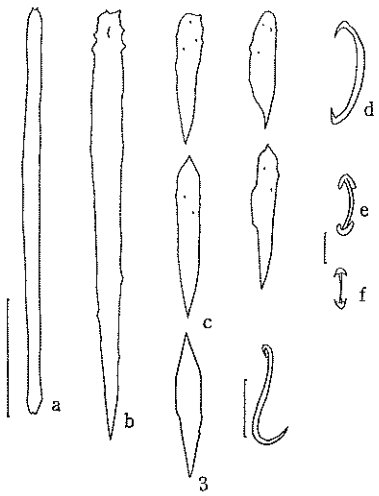


Fig. 57. *Myxilla parasitica* Lambe. (SIS–086).

1. Portion of skeleton in endosome. Scale: 100 μm. 2. Portion of ascending tract beneath ectosome. Scale: 150 μm. 3. Spicule; Tornote (a), long acanthostyle (b), short acanthostyle (c), sigmata (d), anchorate isochela (e) and birotulate. Scale: 100 μm (macrosclcres), 30 μm (sigmata), 10 μm (anchorate isochela and birotulate).

ascending tracts repeatedly branch and run together, and form irregular meshes generally 80–100 μm in maximum dimension, but occasionally reaching 150 μm or more. Numerous isolated spicules are found in the flesh as secondary tracts, connecting with the ascending tracts and strengthening them. Various microscleres are present in the flesh and near tracts.

Spicule: Tornote; Two categories of Acanthostyle; Sigma; and Two forms of Isochela.

Tornote — Smooth, straight or nearly straight, nearly equal width throughout their length, or slightly tapering at each end or slightly constricted near each end, with each end clearly cut off or abruptly pointed, and weakly spinulated as a crown. Size range 170–179–195 × 4–7–8 μm.

Long Acanthostyle — Straight to gently curved, coarsely and bluntly spined throughout length. Size range 185–210–235 × 11–12–14 μm. Juveniles are more slender.

Short Acanthostyle — Short, stout, straight, coarsely and bluntly spined throughout length, and occasionally smooth or oxeated at base. Size range 65–99–125 × 10–12–15 μm.

Sigma — C-shaped or occasionally S-shaped, 45–65 μm in maximum dimension, shafts 2–5 μm wide.

Birotulate — 15 μm in length.

Isochela — Anchorate type, 20 μm in length.

Distribution: Pacific Coast of Canada; Okhotsk Sea.

In Japan — Hibiki-Nada (Yamaguchi Pref.).

Remarks: The specimen from Hibiki-Nada, tentatively described as *Myxilla* sp. by the writer (Hoshino, 1975c), is included in this species.

85. *Myxilla productus* n. sp.

(Fig. 58; Pl. 6, Fig. 2)

Material examined: SAT–025 (Holotype), SAT–026, SAT–027, SAT–028, SAT–034, SAT–037, Uchinoura, 5–XI–1975.

Dimensions: 29 cm in height, and expanding in 15 × 4 cm, (SAT–025).

Habitat: Subtidal zone, 5–20 m in depth, on rocky substrate.

Shape: Sponge consists of several, long, solid cylindrical and conical branches. Occasionally branches clavate or digitate. Branches rise from a common base, and generally expand in one plane.

Color: Ivory Buff 04EB.

Consistency: Very hard and tough.

Surface: Like lacing braid, uneven, and slightly undulate.

Ectosome and Endosome: Reticulation of well developed ascending tracts and secondary tracts. Each tracts is aggulutinated with acanthostyles and echinated by small acanthostyles. Ascending tracts are 80–120 μm in diameter, and are connected by secondary tracts, 50–80 μm in diameter, at intervals of 200–300 μm. Tornotes radiate at tips of ascending tracts. Sigmata and two

forms of isochelae as microsclere exist in the flesh or near tracts.

Spicule: Tornote; Two categories of Acanthostyle; Sigma; and Two forms of Isochela.

Tornote — Straight or nearly straight or only slightly sinous, slightly tapering from one end to the other or from near middle to each end, and abruptly cut off at each end with several terminal spinules as a crown. Size range 156–172–182 × 5–6.3–8 μm (SAT–025).

Large Acanthostyle: Straight or slightly arched, coarsely spined throughout length, more densely spined at base and near pointed end. Size range 190–201–220 × 8–11–13 μm (SAT–025). Juveniles are more slender.

Small Acanthostyle — Straight or nearly straight, coarsely and sharply spined throughout length. Size range 110–115–125 × 10–11–12 μm (SAT–025).

Sigma — C-shaped, length of chord 50–60 μm, and chord width, 3–4 μm.

Anchorate Isochela — 30 μm in length and 3–4 μm in shaft width.

Birotulate — Duodecimdentate, 15–16 μm in length.

Note:

	Dimensions of specimen	Spicule measurements	
		Tornote	Large Acanthostyle
SAT–025	29 cm high, 15 × 4 cm expanding	156–172–182 × 5–6.3–8	190–201–220 × 8–11–13
SAT–026	20 8 × 2	146–161–185 × 3–6–7	175–194–230 × 10–12–15
SAT–027	30	138–156–178 × 5–6–7	180–202–224 × 8–11–13
SAT–028	18 4 × 2	150–169–182 × 5–6.5–8	156–182–200 × 6–10–13
SAT–034	15 9 × 5	162–169–180 × 5–5.7–7	183–197–205 × 8–11–13
SAT–037	16 11 × 5	152–174–185 × 5–6–8	173–196–218 × 10–12–13

Spicule measurements			
Small Acanthostyle	Sigma	Anchorate Isochela	Birotulate
110–115–125 × 10–11–12	50–60 × 3–4	30 × 3–4	15–16
100–111–130 × 9–11–13	50 × 3	30	18–20
106–122–143 × 8–10–13	50–60	30 × 3	13
90–114–129 × 7–8–10	45–55	very rare	13–15
106–115–120 × 7–9–10	50	30	15
110–119–130 × 9–10–12	45–50	30	15

Remarks: This species is characterized by long, well developed branchy external form and having sigmata, anchorate isochelae, and birotulates as microscleres. This species resembles *Myxilla lobatus* n. sp., described earlier, but differs in having anchorate isochelae as microscleres.

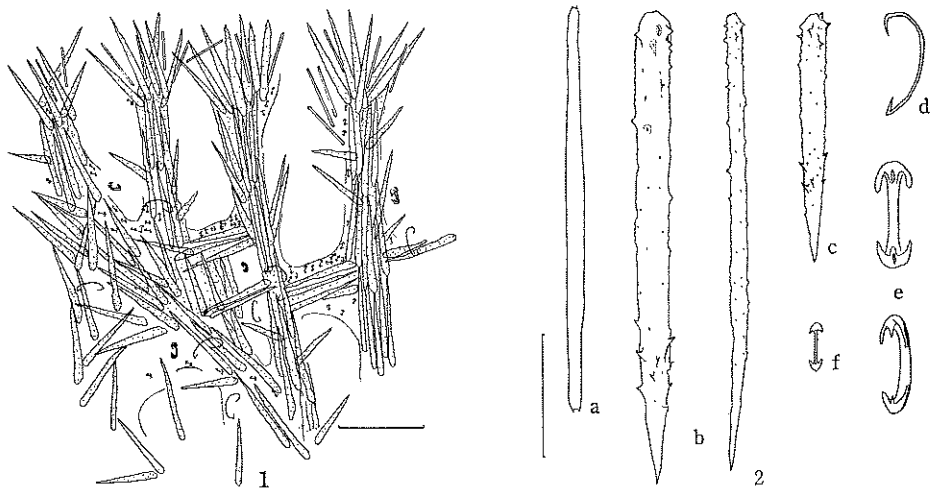


Fig. 58. *Myxilla productus* n. sp. (SAT-025, Holotype).

1. Portion of skeleton in endosome beneath ectosome. Scale: 200 μm. 2. Spicule; Tornote (a), large acanthostyle (b) and its juvenile (b), small acanthostyle (c), sigma (d), anchorate isochela (e) and birotulate (f). Scale: 50 μm.

86. *Myxilla rosacea* (Lieberkühn, 1859)

Halichondria rosacea Lieberkühn, 1859, p. 520, Pl. 11, fig. 2.

Myxilla rosacea: Schmidt, 1862, p. 71; Lundeck, 1905, p. 138, Pl. 4, fig. 8, Pl. 14, fig. 4; Babic, 1921, p. 10, fig. 8; 1922, p. 253; Topsent, 1925, p. 697, 1928b, p. 244; Hentschel, 1929, p. 942; Burton, 1956, p. 129; Levi, 1959, p. 129; 1960, p. 758; Tanita, 1970a, p. 89, Pl. 2, fig. 6b; Boury-Esnault, 1971, p. 309; Hoshino, 1977b, p. 7.

Myxilla fasciculata Schmidt, 1862, p. 71.

Myxilla tridens Schmidt, 1864, p. 36.

Myxilla esperii Schmidt, 1864, p. 36.

Myxilla rosacea var. *japonica* Ridley et Dendy, 1887, p. 130, Pl. 26, fig. 3, Pl. 27, fig. 8, fig. 8(a–c), Pl. 47, fig. 3; Hoshino, 1971, p. 24.

Dendoryx rosacea var. *japonica*: Lindgren, 1897, p. 482; 1898, p. 307, Pl. 18, fig. 5.

Distribution: Cosmopolitan
In Japan — Sagami Bay; Ebisuhama; Hirado Strait.

87. *Myxilla setoensis* Tanita, 1961

Myxilla setoensis Tanita, 1961d, p. 342, Pl. 2, figs. 8–9, t-fig. 3; Kim *et al*, 1968, p. 40, Pl. 2, fig. 10, t-fig. 11, Rho *et al*, 1969, p. 158, Pl. 1, fig. 6; Hoshino, 1971, p. 23.

Distribution: Korea Strait.
In Japan — Inland Sea of Japan.

Genus *Hymedesmia* Bowerbank, 1864

88. *Hymedesmia uchinourensis* n. sp.

(Fig. 59; Pl. 6, Fig. 3)

Material examined: SAT–015–B (Holotype), Uchinoura, 5–XI–1975.
Dimensions: 2 × 1.5 × less than 0.5 (thickness) cm.
Habitat: Subtidal zone, on under sides of pebbles.
Shape: Very thin, encrusting, less than 0.5 mm in thickness.
Color: Maple 07GD when dry.
Consistency: Unrecognizable.
Surface: Smooth to touch. Oscules and pores invisible.
Ectosome and Endosome: No differentiation between ectosome and endosome. The skeleton consists of tornotes horizontally arranged on substratum, with two sorts of acanthostyles tangentially arranged on base of tornotes, and isochelae scattered near tips of short acanthostyles.
Spicule: Tornote; Two sorts of Acanthostyle; and Isochela.
Tornote — Smooth, thin or occasionally stout, nearly straight to slightly arched, slightly tapering to each end, with one end tapering to a point, and the other end becoming slender near tip as a neck and sharply pointed. Size range 195–204–215 × 2–4–5 μm.
Long Acanthostyle — Straight or slightly arched, conical, completely spined throughout length, except near pointed end, with base swollen and strongly spined. Size range 160–188–216 × 4–6–7 μm.
Short Acanthostyle — Short, straight or nearly straight, conical, completely spined, base swollen and heavily spined. Size range 85–96–105 × 6–7–8 μm.
Isochela — Stout, arcuate type, shaft serrated, 30 μm long, 3 μm wide.
Remarks: This species is characterized by having tornotes as auxiliary spicule, and is easily distinguished from other related species having isochelae serrated on shaft, namely *Hymedesmia (Ectyodesmia) serulata* Vacelet, 1969, *Anchinoe acanthochela* Koltun, 1964, and so forth.

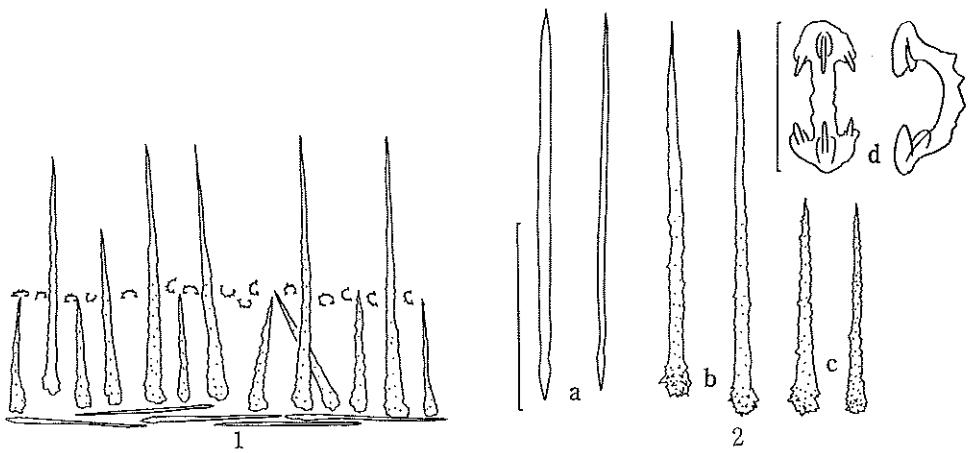


Fig. 59. *Hymedesmia uchinourensis* n. sp. (SAT–015–B, Holotype).
1. Diagrammatic spicule arrangement (cross section). 2. Spicule; Tornotes (a), long acanthostyles (b), short acanthostyles (c) and isochelae (d). Scale: 100 μm (macroscleres), 30 μm (isochelae).

Family Tedaniidae Ridley et Dendy, 1887

Genus *Acarnus* Gray, 1867

89. *Acarnus bicladotylota* n. sp.

(Fig. 60; Pl. 6, Fig. 4)

Material examined: AR-1-10 (Holotype), AR-1-70, Matsushima Maeshima, 16-V-1972.

Dimensions: 4×3×1 cm, (AR-1-10).

Habitat: Intertidal zone, low tide subzone.

Shape: Thin irregular encrusting sponge. A barnacle, *Acasta* is commensal in this sponge.

Color: Red Orange 22OA in life but changes dirty gray when dry.

Consistency: Soft in life but very hard when dry.

Surface: Very dirty and covered with detritus, sand grains and shell fragments. Oscules and pores invisible.

Ectosome: Confused horizontal arrangement of tylotes.

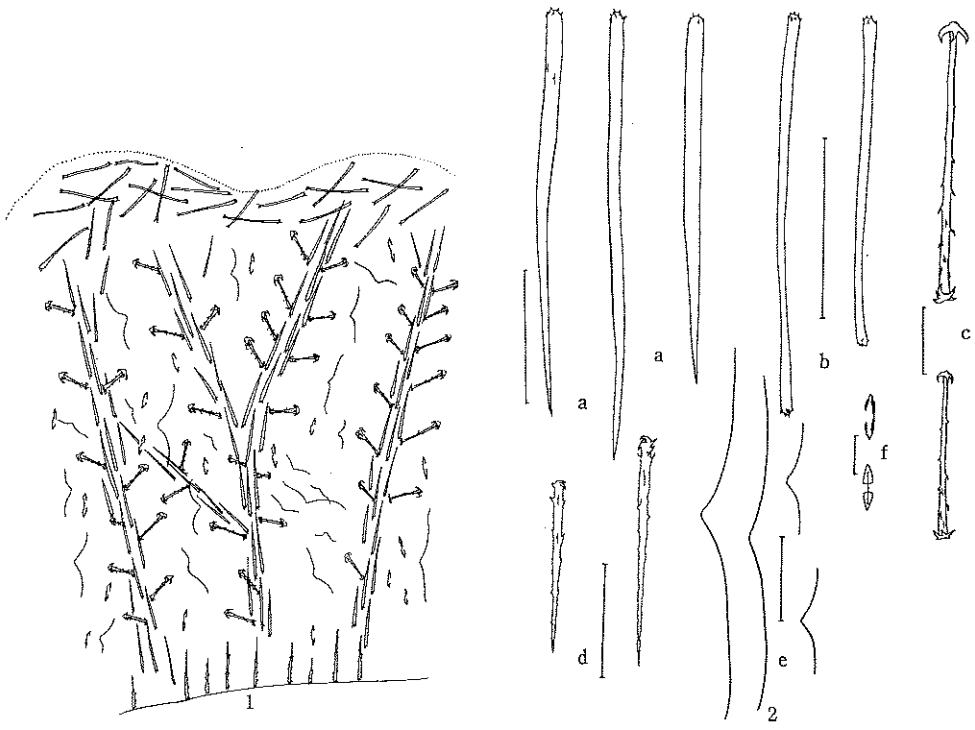


Fig. 60. *Acarnus bicladotylota* n. sp. (AR-1-60, Holotype).

1. Diagrammatic spicule arrangement (cross section). 2. Spicule; Stylcs (a), tylotes (b), cladotylotes (c), acanthostyles (d), toxa (e) and isochelae (f). Scale: 50 μm (acanthostyles), 20 μm (isochelae) 100 μm (others).

Endosome: Irregular ascending reticulation of vague or clear tracts of styles, which are bundled with ten or more rows of spicules, having densely echinating cladotylotes. Numerous microscleres are found in the flesh or around tracts.

Spicule: Style; Tylote; Two categories of Cladotylote; Acanthostyle; Two categories of Toxon; and Isochela.

Style — Slender, straight or slightly sinuous, feebly spined and very slightly swollen at base, with other end sharply pointed. Size range 195–341–385 × 8–10–12 μm (AR–1–10).

Tylote — Slender, slightly arched or slightly sinuous, both ends slightly swollen and elongated with several feeble spines. Size range 205–267–300 × 3–4.7–6 μm (AR–1–10).

Cladotylote — Shaft straight or slightly curved, coarsely spined, clad of one end with peculiar spines and those of other end with several irregular spines. Size range 140–160–175 × 4–5.5–7 μm and 80–88–95 × 2–3.6–6 μm (AR–1–10).

Acanthostyle — Small, straight, coarsely spined throughout length. Size range 80–90–95 × 3–4–5 μm (AR–1–10).

Toxon — Smooth, thin, bent backward at each end. Size range 60–110 × 1–2 μm and 130–210 × 2–3 μm (AR–1–10).

Isochela — Small, arcuate, 15 μm long (AR–1–10).

Note:

	Dimensions of specimen	Spicule measurements	
		Style	Tylote
AR–1–10	4 × 3 × 1 cm	195–341–385 × 8–10–12	205–267–300 × 3–4.7–6
AR–1–70	3 × 6 × 1	215–232–394 × 6–9.4–11	245–272–310 × 4–5–6

Spicule measurements	
Cladotylote	Acanthostyle
80–88–95 × 2–3.6–6 and 140–160–175 × 4–5.5–7	80–90–95 × 3–4–5
82–92–110 × 2–3–4 and 140–158–180 × 3–4.5–6	83–89–95 × 3–4.5

Spicule measurements	
Toxon	Isochela
60–110 × 1–2 and 130–210 × 2–3	15
70–90 × 1–2 and 130–190 × 2–3	15

Remarks: This species is closely related to *Acarnus erithacus* De Laubenfels, 1927 from California, but is clearly distinguishable from it in having large cladotylote entirely spined along shaft. This species differs from *Acarnus tenerus* Tanita, 1963 from Noto Peninsula, primarily in having two categories of cladotylotes.

90. *Acarnus tenerus* Tanita, 1963

Acarnus tenerus Tanita, 1963, p. 123, Pl. 4, fig. 2, t-fig. 2.

Distribution: In Japan—Noto Peninsula.

Genus *Forcepia* Carter, 1874

91. *Forcepia solustylota* Hoshino, 1977

(Pl. 9, Figs. 4–6)

Forcepia solustylota Hoshino, 1977b, p. 7, Pl. 3, figs. 1–8, t-fig. 1.

Material examined: SAT-043, Uchinoura, 5-XI-1975.

Dimensions: Thin, less than 1 mm thick.

Habitat: Subtidal zone, on surface of another sponge, *Stelletta*.

Shape: Very thin sponge which cling to spicules protruding from surface of another sponge.

Color: Ivory Buff 04EB.

Consistency: Unrecognizable.

Surface: Unrecognizable.

Ectosome and Endosome: Vague tracts or masses of tylotes, and microscleres clinging or adhering to protruding spicules of host sponge.

Spicule: Tylote; Two categories of Sigma; Forceps; and Two categories of Isochela.

Tylote — Smooth, straight or slightly arched or very slightly sinuous, nearly consistant in width throughout length, becoming slender near each end, with each end slightly elongated and swollen 1.5 times the diameter of the other part. Size range 180–212–225 × 4–5–6 μm. Tyles are roughly 10 μm long and 7 μm wide.

Sigma — Two size modes, smooth, C-shaped, measuring 60–70 × 7 μm and 30 × 3 μm.

Forceps — Stout, strongly bent at the middle with both arms becoming parallel to each other, minutely spined throughout length, each arm measuring 26 × 4 μm.

Isochela — Arcuate type, two size modes, measuring 30 μm and 12 μm long.

Distribution: In Japan — Kii Channel

Remarks: The specimen examined in this study, lacked the thin forceps described in the holotype, but the writer assigned it to this species, since the morphology, with the exception of the forceps, agrees with the original description.

Genus *Iotrochota* Ridley, 1884

92. *Iotrochota baculifera* Ridley, 1884

(Pl. 10, Figs. 5–6)

Iotrochota baculifera Ridley, 1884, p. 435, Pl. 39, fig. M, Pl. 42, fig. f; Topsent, 1893, p. 173; 1897, p. 455; Lindgren, 1897, p. 482; 1898, p. 300; Thiele, 1899, p. 18; 1903, p. 947; Hentschel, 1912, p. 347; Dendy, 1916b, p. 123; 1921a, p. 97; Levi, 1959, p. 132, fig. 24; Tanita, 1969, p. 73, Pl. 2, fig. 6, t-fig. 1; Vacelet et Vasseur, 1971, p. 94; Bergquist, 1965, p. 163; 1967, p. 184, Pl. 1; Vacelet, et al 1976, p. 64. *Hiattrochota baculifera*: 1954a, p. 124, t-fig. 77; Hoshino, 1976c, p. 6, Pl. 2, figs. 10–12.
Hiattrochota hiatti De laubenfels, 1954a, p. 125, t-fig. 78.
Hiattrochota mystile De Laubenfels, 1954a, p. 126, t-fig. 79.

Material examined: AR–1–78, Matsushima Maeshima, 16–V–1972.

Dimensions: $5 \times 6 \times 1$–5 (thickness) cm, a small portion of sponge $20 \times 20 \times 1$–5 cm in nature.

Habitat: Intertidal zone, low tide subzone, on rocky substrate.

Shape: Irregular thick encrusting sponge.

Color: Dusky Madder Violet 42PH.

Consistency: Very soft, with much mucous.

Surface: Conulose, with conules 0.5 mm in height on entire surface.

Ectosome: Irregular, horizontal reticulation of vague tracts of strongyles.

Endosome: Irregular reticulation of tracts of styles. Numerous birotulates exist in the flesh.

Spicule: Style; Strongyle; and Birotulate.

Style — Smooth, nearly straight or slightly bent at one fourth spicule length from base, base rounded, abruptly pointed at the other end. Size range 165–170–190 $\times$ 8–9–10 μm.

Strongyle — Nearly straight, slightly tapering from one end to the other, each end rounded. Size range 190–220–235 $\times$ 5–6–7 μm.

Birotulate — With twelve to thirteen wings at each end, measuring approximately 15 μm in length.

Distribution: Cosmopolitan

In Japan — Sado; Ariake Sea.

Remarks: De Laubenfels (1950, p. 19) established the genus *Hiattrochota,* to which he subsequently transfered this species. The genus *Hiattrochota,* however, is a junior synonym of the genus *Iotrochota*. *Hiattrochota hiatti* De Laubenfels 1954 and *Hiattrochota mystile* De Laubenfels, 1954 were concluded to be synonyms of this species by Bergquist (1965).

Genus *Lissodendoryx* Topsent, 1892

93. *Lissodendoryx isodictyalis* (Carter, 1882)

(Fig. 61)

Halichondria isodictyalis Carter, 1882, p. 285.
Tedania leptoderma Topsent, 1889, p. 49.
Lissodendoryx leptoderma: Topsent, 1894, p. 35.
Lissodendoryx isodictyalis: Topsent, 1897, p. 456; 1925, p. 701; 1936, p. 18; De Laubenfels, 1936a, p. 93, Pl. 11, fig. 2; 1947, p. 35; 1950, p. 73; 1956, p. 2; Dickinson, 1945, p. 20, Pl. 28, fig. 56, Pl. 29, figs. 57–58, Pl. 30, figs. 59–60; Hartman, 1958, p. 41, Pl. 4, fig. 12; Little, 1963, p. 48; Hechtel, 1965, p. 38; Kim

et al, 1968, p. 40, Pl. 2, fig. 11, t-fig. 12; Simpson, 1968a, p. 81, Pl. 16, t-fig. 11–12; Rho *et al*, 1971, p. 184; Hoshino, 1971, p. 23; Wicdenmayer, 1977, p. 135, Pl. 29, fig. 2, t-figs. 141–142.

Lissodendoryx carolinensis Wilson, 1912, p.11.

Material examined: SIS–034–a, Mukaishima, 27–VIII–1969; SIS–152, Sasajima, 21–I–1976.

Dimensions: $3 \times 2 \times 0.5$ (thickness) cm, (SIS–034–a)

Habitat: Intertidal zone, mid tide subzone, on rocky substrate.

Shape: Thin irregular encrusting sponge on shell surface or on rocky surface. Thickness of sponge is less than 1 cm but occasionally reaches 2 cm.

Color: Pale Cinnamon Pink 10BB or Pinkish Cinnamon 08GB.

Consistency: Compressible or slightly compressible.

Surface: Irregularly and deeply rugose, or markedly undulated, occasionally oscules of less than 1 mm in diameter, are scattered on surface. Pores invisible.

Ectosome: Brushes of tylote tracts irregularly protrude from surface. Numerous microscleres densely scattered in fleshy dermis.

Endosome: Subisodictyal reticulation of styles. Numerous microscleres scattered in flesh or fringe cavities and aquiferous system.

Spicule: Tylote; Style; Isochela; and Sigma.

Tylote — Smooth, almost straight ot slightly sinuous, very slightly tapering from one end to the other, with each end elongated and slightly swollen. Size range 207–226–236 × 6–6–7 μm (SIS–034–a). Swollen part of each end of spicule is about 13 μm long and 7–8 μm wide.

Style — Smooth, straight or slightly bent, nearly consistant in width throughout length, base rounded and with other end sharply pointed. Size range 175–182–190 × 7–8–10 μm (SIS–034–a).

Isochela — Arcuate type, 20–23 μm long (SIS–034–a).

Sigma — C-shaped or occasionally twisted S-shaped, 15–20 μm long by 15 μm (SIS–034–a).

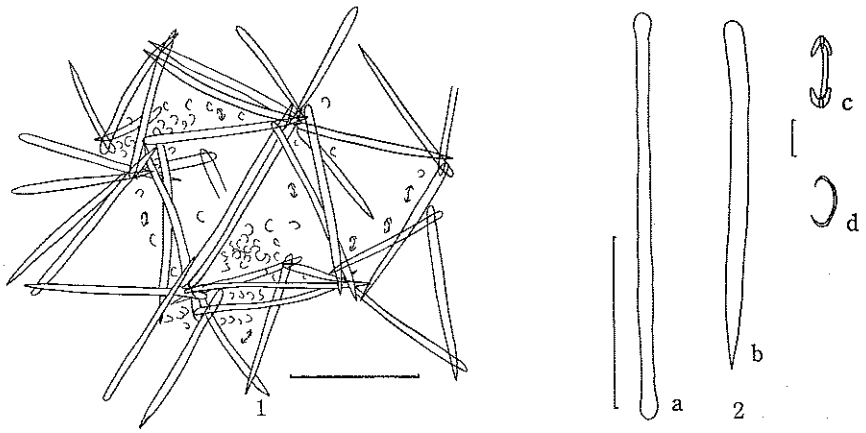


Fig. 61. *Lissodendoryx isodictyalis* (Carter). (SIS–034a)

1. Portion of skeleton in endosome. Scale: 100 μm. 2. Spicule; Tylote (a), style (b), isochela (c) and sigma (d). Scale: 100 μm (macroslercs), 10 μm (microscleres).

Distribution: Cosmopolitan.
In Japan — Inland Sea of Japan.
Note:

	Dimensions of specimen	Spicule measurements
		Tylote
SIS-034-a	3×2×0.5 cm	207–226–236×6–6–7
SIS-152	8×4×1.5 cm	205–232–285×3–5–6

Spicule measurements		
Style	Isochela	Sigma
175–182–190×7–8–10	20–23	15–20×1.5
168–182–195×5–5.5–6	15–20	19–22

Remarks: This species is widely distributed in tropical, subtropical and temperate seas. Hartman (1958) discussed spicule measurement of this species from different localities using specimens described by various authors. Simpson (1968) through his histological and cytochemical investigations, concluded that *Lissodendoryx caloliensis* was a valid species.

94. *Lissodendoryx rarus* n. sp.

(Fig. 62; Pl. 6, Fig. 5)

Material exanined: SAT-046-1 (Holotype), SAT-062-2, Uchinoura, 5-XI-1975.

Dimensions: 3×1.5×0.2 (thickness) cm, (SAT-046-1).

Habitat: Subtidal zone, 10–20 m in depth, on surface of coral or stone.

Shape: Very thin encrusting sponge.

Color: Black or Deep Brown or Gray.

Consistency: Slightly compressible or incompressible.

Surface: Even, but minutely hispid. Pores invisible. Oscules, up to 0.5 mm in diameter, scattered on surface or occasionally invisible.

Ectosome: Coarse, confused arrangement of tylotes.

Endosome: Irregular reticulation of the primary and secondary tracts. Primary tracts are 60–80 μm thick, and composed of two or more rows of acanthostyles. These tracts are connected with one, two or occasionally more acanthostyles as secondary tracts. Isochelae are found in the flesh near ectosome.

Spicule: Tylote; Two categories of Acanthostyle; and Isochela.

Tylote — Straight or slightly arched, smooth, nearly consistant in width throughout length, with each end elongated and slightly swollen. Size range 170–176–180×4 μm (SAT-046-1).

Large Acanthostyle — Straight or slightly arched, irregularly and minutely

spined throughout length except near the pointed end. Size range 215–236–250×7–8.7–10 μm (SAT–046–1).

Small Acanthostyle — Small, straight, conical, entirely spined, being more coarsely spined near base. Size range 85–99–150×6–8–9 μm (SAT–046–1).

Isochela — Arcuate type, 28 μm long, shaft 3 μm wide (SAT–046–1).

Note:

	Dimensions of specimen	Spicule measurements
		Tylote
SAT–046–1	3×1.5×0.2 cm	170–176–180×4
SAT–062–2	5×3×less than 0.1 cm	195–243–250×3–4–5

Spicule measurements		
Large Acanthostyle	Small Acanthostyle	Isochela
215–236–250×7–8.7–10	85–99–150×6–8–9	28×3
210–216–250×10–11–12	100–108–115×8–10–11	25×5

The specimen, SAT–062–2, is thinner than SAT–046–1, therefore, the reticulated skeleton in endosome is not found but rather there is only a tangential arrangement of two categories of acanthostyle.

Remarks: This species is closely related to *Lissodendoryx oxytes* De Laubenfels, 1954 in habitat, external form, and coloration, but is distinguished by spicule morphology.

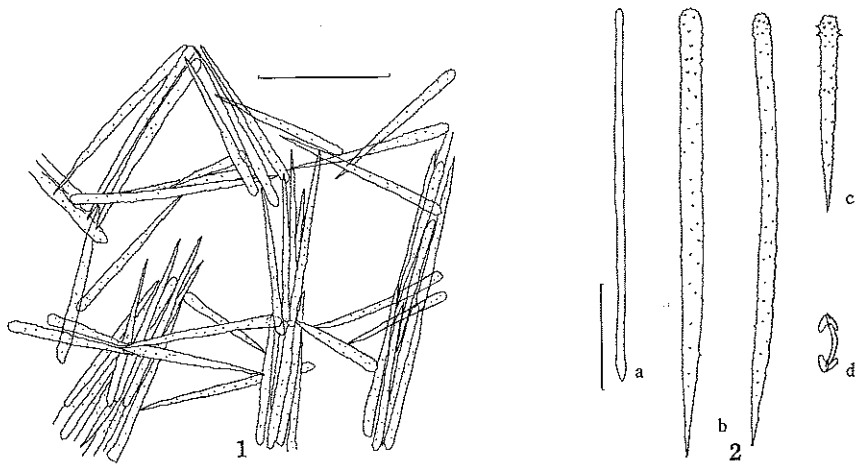


Fig. 62. *Lissodendoryx rarus* n. sp. (SAT–064–1, Holotype)

1. Portion of skeleton in endosome. Ectosome: To upper. Scale: 200 μm. 2. Spicule; Tylote (a), large acanthostyle (b), small acanthostyle (c) and isochela (d). Scale: 50 μm.

95. *Lissodendoryx spinulosa* Tanita, 1968

Lissodendoryx spinulosa Tanita, 1968, p. 46, Pl. 1, fig. 4, t-fig. 6; Hoshino, 1974, p. 9.

Distribution: In Japan — Ariake Sea.

Genus *Tedania* Gray, 1867

96. *Tedania brevispiculata* Thiele, 1903

(Fig. 63; Pl. 10, Figs. 1–4)

Tedania brevispiculata Thiele, 1903, p. 947, fig. 15 (a–c); Levi, 1961a, p. 136, fig. 9; Hoshino, 1976, p. 6, Pl. 2, fig. 17.

Tedania digitata: Hoshino, 1974, p. 10, Pl. 1, fig. 8.

Material examined: SIS–149, Mukaishima, 20–I–1976; AR–1–33, AR–1–37, AR–1–43, AR–1–45, AR–1–47, AR–1–48, AR–1–49, AR–1–66, AR–1–70, Matsushima Maeshima, 16–V–1972.

Dimensions: $6 \times 6 \times 2$ (thickness) cm, (AR–1–33).

Habitat: Intertidal zone, low tide subzone, on rocky substrate.

Shape: Irregular, thick, usually 1–2 cm but occasionally 3 cm thick, encrusting sponge.

Color: Red Orange 22OA.

Consistency: Slightly compressible, not very tough.

Surface: Smooth, markedly uneven and wrinkled. Oscules less than 1 mm in diamter scattered sparsely on surface. Pores microscopic.

Ectosome: 50–100 μm thick, but occasionally 300 μm thick. Horizontal, confused arrangement of tylotes in most parts, and dense, perpendicular arrangement in some parts. In the horizontal arrangement, spicules show a tendancy to form very vague tracts.

Endosome: Irregular subisodictyal reticulation of styles, and very vague tracts composed of styles and raphides ascending to the surface.

Spicule: Tylote; Style; and Raphide.

Tylote — Almost straight, of nearly constant thickness throughout length, each end slightly and spherically swollen with several weak spinules. Size range 244–251–265 $\times$ 3–3.5–5 μm (AR–1–33).

Style — Smooth, straight to slightly arched, base rounded, of nearly constant width throughout length, with other end sharply pointed. Size range 218–244–265 $\times$ 6–7–8 μm (AR–1–33).

Raphide — Thin, straight to gently arched, peculiarly rough, tapering to a point at each end, measuring up to 190 $\times$ 2 μm (AR–1–33).

Distribution: Ternate; Nha Trang.

In Japan — Ariake Sea.

Note: The general description of this species from the Ariake Sea is in Hoshino (1974, 1976).

Remarks: This species closely resembles *Tedania digitata* Schmidt and *Tedania ignis* (Duchassing et Michelotti), and also resembles *Tedania coralliophilia, Tedania reticulata* and *Tedania maeandrica* of Thiele (1903) from Ternate. Further examination of these species is needed, especially concerning the morphology of the raphide.

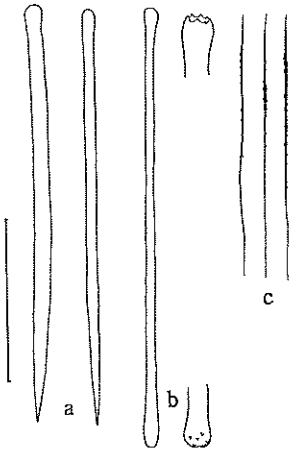


Fig. 63. *Tedania brevispiculata* Thiele. (SIS–149).

Spicule; Styles (a), tylote (b) and raphides (c). Scale: 100 μm.

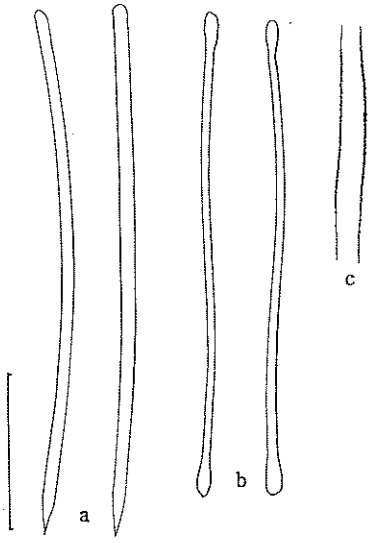


Fig. 64. *Tedania levigotylota* n. sp. (MIT–054, Holotype).

Spicule; Styles (a), tylotes (b) and raphides (c). Scale: 100 μm.

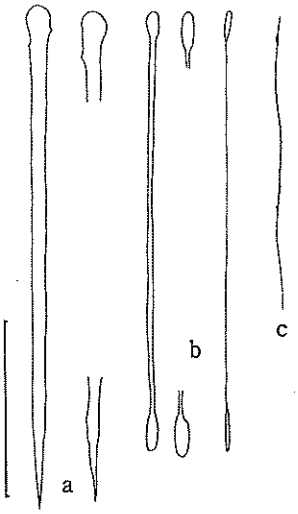


Fig. 65. *Tedania palola* n. sp. (SIS–101, Holotype).

Spicule; Style (a), tylotes (b) and raphide (c). Scale: 100 μm.

97. *Tedana levigotylota* n. sp.

(Fig. 64; Pl. 6, Fig. 6)

Material examined: MIT–054 (Holotype), MIT–067, MIT–091, MIT–105, Mitsukue, 4–XI–1973.

Dimensions: $9 \times 15 \times 6$ (height) cm, (MIT–054).

Habitat: Subtidal zone, 15 m in depth, on rocky substrate.

Shape: Thick encrusting or irregular massive sponge, with basal thin encrusting part spreading on rock surface, 3–4 cm in thickness, with numerous upright chimneys protruding from base and oscules opening at the summit.

Color: Jasper Red 22LA.

Consistency: Soft to touch in life, but shrinks markedly after preservation or desiccation.

Surface: Smooth to touch. Oscules open at summit of protruding chimneys. Pores invisible.

Ectosome: Confused, horizontal arrangement of tylotes, which occasionally develop vague reticulation of tracts. Numerous raphides are densely packed in fleshy dermis.

Endosome: Irregular reticulation of vague tracts of styles. Secondary tracts do not develop. Numerous raphides are densely packed in wall of aquiferous system.

Spicule: Tylote; Style; and Raphide.

Tylote — Smooth, variable, nearly straight to gently sinuous, uniform in width throughout length, and elongated and slightly swollen at each end. Size range $280–323–345 \times 3–4.5–6$ μm (MIT–054).

Style — Smooth, nearly straight or slightly arched, nearly constant width throughout length, base rounded, with other end sharply pointed. Size range

	Dimensions of specimen	Spicule measurements
		Tylote
MIT–054	$9 \times 15 \times 6$ cm	$280–323–345 \times 3–4.5–6$
MIT–067	$6 \times 8 \times 8$	$205–280–340 \times 3–4–5$
MIT–091	$8 \times 5 \times 5$	$300–349–370 \times 4–5–6$
MIT–105	very thin on shell surface	$325–350–420 \times 4–5–6$

Spicule measurements	
Style	Raphide
$345–354–375 \times 6–7–8$	up to 190×0.8
$305–338–365 \times 5–6.6–8$	up to 220×1.5
$300–312–331 \times 8–10–12$	up to 300×2
$280–310–350 \times 8–9–10$	up to 300×3

345–354–375 × 6–7–8 μm (MIT–054).

Raphide — Rough, slightly arched, tapering from middle to each end, measuring up to about 190 × 0.8 μm (MIT–054).

Note: See the table in the preceding page.

Remarks: This species differs from its sibling species *Tedania brevispiculata* in coloration, consistency and spicule measurement.

98. *Tedania palola* n. sp.

(Fig. 65; Pl. 6, Fig. 7)

Material examined: SIS–050, Shimoebushima, 1–III–1972; SIS–101 (Holotype), Mukaishima, 26–V–1975; JAP–025, Kurotsusaki, 5–XI–1977.

Dimensions: Less than 1 × 1 cm, and less than 0.5 cm thick (SIS–101).

Habitat: Intertidal zone, low tide subzone, on surface of a polychaete tube.

Shape: Thin encrusting sponge, less than 0.5 cm thick.

Color: Red Orange 22OA or Jasper Red 22LA.

Consistency: Slightly compressible, not tough, and mucoid.

Surface: Conulose, inconspicuously low. Oscules and pores microscopic.

Ectosome: Confused horizontal arrangement of tylotes, and vague tracts of tylotes, 80–100 μm in diameter, running irregularly in places.

Endosome: Coarse, irregular reticulation of meandering and vague tracts of styles, 40–80 μm in diameter, and occasionally greater, and in places, coarse, confused arrangements of styles and raphides.

Spicule: Tylote; Style; and Raphide.

Tylote — Almost straight or slightly arched or slightly sinuous, tapering from middle to each end, both ends elongated and swollen. Size range 185–240–260 × 2–4–6 μm and each end about 15 μm long and 6 μm wide (SIS–101).

Style — Nearly straight to slightly bent near base, base slightly swollen and occasionally bluntly spined, with other end sharply pointed, occasionally with irregular roughened end. Size range 225–269–330 × 5–7–8 μm (SIS–101).

	Dimensions of specimen	Spicule measurements
		Tylote
SIS–050	8 × 2 × less than 0.1 cm	217–246–268 × 4–5–6
SIS–101	1 × 1 × 0.5	185–240–260 × 2–4–6
JAP–025	2 × 2 × 0.5	185–236–245 × 4–5–6

Spicule measurements	
Style	Raphide
268–278–310 × 7–8–10	very rare
225–269–330 × 5–7–8	up to 150
203–231–255 × 6–7–9	up to 210

Raphide — Very thin, rough, up to 150 μm long. Rare (SIS–101).

Note: See the table in the preceding page.

Remarks: This species is closely related to *Tedania microrhaphidiophora* Burton, 1935, in having weakly spinulated styles, but differs in having invariable tylotes.

Group Microcioniformes De Laubenfels, 1936

Family Microcionidae Hentschel, 1923

Genus *Eurypon* Gray, 1867

99. *Eurypon naikaiensis* n. sp.

(Fig. 66; Pl. 6, Fig. 8)

Material examined: SIS–090–2–c, SIS–090–2–d, SIS–090–3–a, SIS–090–4–a (Holotype), SIS–090–4–c, SIS–090–6, SIS–121, Sasajima, 21–I–1976; SIS–135, Sasajima, 11–VI–1975.

Dimensions: Less than a few centimeters square, and less than 2 mm in thickness.

Habitat: Intertidal zone, low tide subzone, on surface of polychaete tube.

Shape: Very thin, encrusting sponge, 0.2–0.3 mm in thickness or occasionally 2 mm in thickness on a polychaete tube or on shell surface.

Color: English Red 17LC or Peach Red 20LA.

Consistency: Slightly compressible.

Surface: Smooth to touch, even. Pores and oscules invisible.

Ectosome and Endosome: Spicules tufts, 45–50 μm in diameter, composed of stout styles, standing erectly 50–400 μm high, and 70–210 μm apart, on a polychaete tube surface, and short acanthostyles also standing seperately on polychaete tube surface. Ectosome is composed of brushes of more slender and shorter styles than those in endosome, which continue from endosome spicule tufts. In endosome, slender styles arranged coarsely and confusingly. In juvenile specimen, skeleton is more simple than described above, namely, stout styles and short acanthostyles standing seperately on polychaete tube surface, and slender styles arranged thickly and horizontally over tips of stout styles.

Spicule: Stout Style; Slender Style; and Short Acanthostyle.

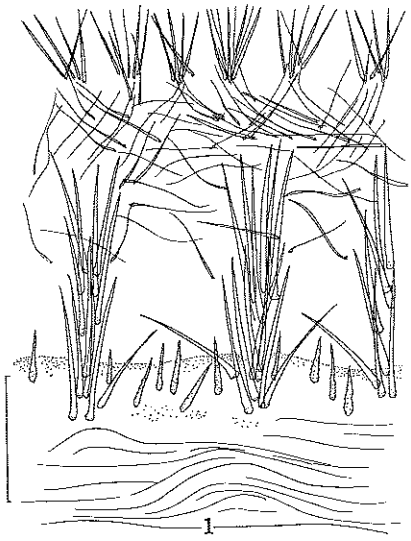
Stout Style — Stout, gently curved, tapering from base to sharply pointed end, base bluntly spined. Size range 145–244–362 × 9–11–12 μm (SIS–090–4–a).

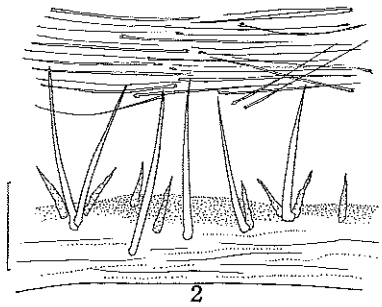
Slender Style — Slender, almost straight or very slightly sinuous, base slightly swollen and spinulated with several spines, with other end sharply pointed. Size range 185–307–385 × 3–5–8 μm (SIS–090–4–a). Spicules, which constitute ectosome brushes, are shorter than those of other portion.

Short Acanthostyle — Short, conical, coarsely spined throughout length. Size range 58–61–65 × 4–6–7 μm (SIS–090–4–a).

Note:

	Spicule measurements		
	Stout Style	Slender Style	Short Acanthostyle
SIS–090–2–c	135–177–235×6–8.5–12	190–214–324×3–4–6	65–70–80×5–6–8
SIS–090–2–d	125–201–335×6–8.6–11	203–269–333×3–4.5–6	65–70–80×6–7–8
SIS–090–3–a	128–226–322×6–9–11	230–311–550×3–5–8	60–63–70×5–6.4–8
SIS–090–4–a	145–244–362×9–11–12	185–307–385×3–5–8	58–61–65×4–6–7
SIS–090–4–c	180–253–330×8–9.4–11	215–284–356×3–5–6	60–65.6–70×5–6–8
SIS–090–6	185–270–300×7–9–10	130–238–315×3–4–6	60–65–67×4–5–6
SIS–121	175–283–350×6–8–10	150–277–375×3–4–5	50–57–65×5–6–7
SIS–135	270–329–398×6–7.5–10	118–154–234×2–3.5–5	58–67–72×6–7–8





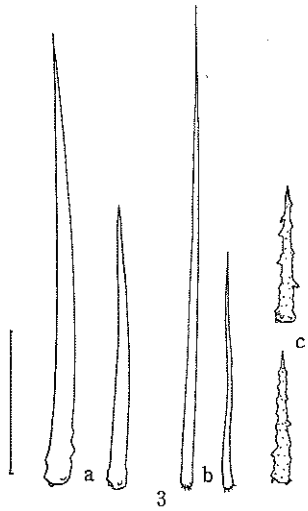


Fig. 66. *Eurypon naikaiensis* n. sp. (SIS–090–4–a, Holotype).

1. Diagrammatic spicule arrangement. Lower part: Annelid tube. Scale: 500 μm. 2. Diagrammatic spicule arrangement of paratype (SIS–090–2–c). Lower part: Annelid tube. Scale: 100 μm. 3. Spicule; Stout styles (a), slender styles (b) and short acanthostyles (c). Scale: 100 μm.

Remarks: This species closely resembles *Eurypon clavatella* Little, 1963, but differs in the size of acanthostyles and in having stout styles in place of tylostyles.

Genus *Microciona* Bowerbank, 1863 sensu Simpson, 1968

100. *Microciona spinatoxa* n. sp.

(Fig. 67; Pl. 7, Fig. 1)

Material examined: SIS–033 (Holotype), Sasajima, 27–VIII–1969.

Dimensions: $3 \times 3 \times$ less than 1 cm high.

Habitat: Intertidal zone, low tide subzone, on rocky substrate.

Shape: Irregular thin encrusting sponge on rock surface, protruding numerous columns, 1 mm in diamter, 0.5–0.7 cm high, and 2–3 mm apart. Thickness of portion without columns is 3–4 mm.

Color: Orange Yellow 05PA.

Consistency: Slightly compressible, fragile.

Surface: Smooth to touch, even. Oscules and pores invisible.

Ectosome: 50–60 μm in thickness. Confused, horizontal arrangement of slender styles.

Endosome: Numerous tracts ascend, ramifying, to surface from the confused arrangement of spicules near substrate. These tracts are cored with stout styles and irregularly echinated with stout styles and short acanthostyles, 30–50 μm in diamter and 100–400 μm apart.

Spicule: Stout Style; Slender Style; Short Acanthostyle; Toxon; and Isochela.

Stout Style — Stout, long, straight or slightly arched, tapering from base to

Fig. 67. *Microciona spinatoxa* n. sp. (SIS–033, Holotype).

1. Portion of skeleton in endosome beneath ectosome. Scale: 300 μm. 2. Spicule; Stout styles (a), slender styles (b), short acanthostyles (c), toxon (d) and isochela (e). Scale: 15 μm (isochela), 100 μm (others).

sharply pointed end, base rounded with numerous blunt spines. Size range 240–279–320 × 9–11–12 μm.

Slender Style — Slender, almost straight or slightly arched, base rounded and spinulated, and tapering from middle to a sharply pointed end. Size range 167–201–250 × 4–6–8 μm.

Short Acanthostyle — Short, straight, conical, and sharply spined throughout length. Size range 105–112–128 × 6–8–10 μm.

Toxon — About 100 μm across, 1 μm thick, bent at the middle, with each end recurved, and spinulated.

Isochela — Small, palmate type, 13 μm long.

Remarks: This species is characterized by having toxa spinulated at each end, and differs from the allied species, *Microciona eurypa*: Bergquist, 1965, in having styles with blunt spines at base. *Microciona eurypa*: Bergquist, 1965 is not a conspecific of *Dictyocinema eurypa* De Laubenfels, 1954.

Genus *Thalysias* Duchassaing et Michelotti, 1864 sensu Simpson, 1968

101. *Thalysias acanthostyli* n. sp.

(Fig. 68; Pl. 7, Fig. 2)

Material examined: SAT–020 (Holotype), Uchinoura, 5–XI–1975.

Dimensions: 8 cm high, 7 cm wide, 1 cm thick.

Habitat: Subtidal zone, 10–15 m in depth.

Shape: Erect, ramose sponge, branching in one plane from single trunk. Branches and trunk cylindroid, about 1 cm in diameter.

Color: Apricot Orange 16HB.

Consistency: Tough.

Surface: Smooth to touch. Pores invisible, with oscules about 0.1 mm in diameter on surface.

Ectosome and Endosome: Reticulation of anastomosing, well developed ascending fibers, cored with stout acanthostyles, and echinated with short acanthostyles. Slender styles, horizontally or, occasionally, irregularly arranged over surface of sponge. Toxa and isochelae scattered in the flesh or near fibers.

Spicule: Acanthostyle; Slender Style; Short Acanthostyle; Toxon; and Isochela.

Acanthostyle — Nearly straight, spined throughout length except near pointed end and very densely spined at base. Size range 150 × 8 to 250 × 11 μm.

Slender Style — Slender, straight, with several spinules at base. Size varies up to 270 × 3 μm.

Short Acanthostyle — Nearly straight or gently curved, conical, sharply spined throughout length. Size range 75 × 6 to 135 × 9 μm.

Toxon — Very thin, long, varying 30 to 120 μm long.

Isochela — Small, palmate type, about 12 μm long.

Remarks: This species is characterized by having acanthostyles in place of

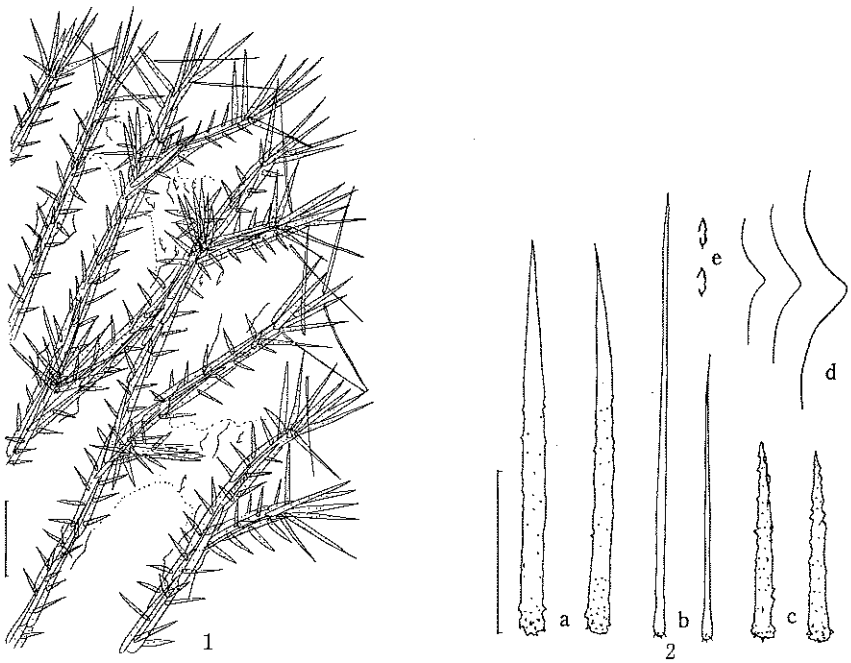


Fig. 68. *Thalysias acanthostyli* n. sp. (SAT–020, Holotype).
1. Portion of skeleton in endosome beneath ectosome. Scale: 100 μm. 2. Spicule; Acanthostyles (a), slender styles (b), short acanthostyles (c), toxa (d) and isochela (e). Scale: 100 μm.

subtylostyles common to other members of the genus *Thalysias*.

102. *Thalysias productitoxa* n. sp.

(Fig. 69; Pl. 7, Fig. 3)

Material examined: SAT–018 (Holotype), SAT–019, Uchinoura, 5–XI–1975; SIS–005, Mukaishima, 6–XI–1971; SIS–018, Hosonosu, 6–XI–1971.

Dimensions: 11 cm high, diameter of trunk about 7 mm, (SAT–018).

Habitat: Intertidal zone to subtidal zone.

Shape: Erect, dendroid sponge, with many dichotomous branches emanating from single long trunk. Branches and trunk cylindroid.

Color: Ecru 08ED or Maple 07GD when dry.

Consistency: Hard, tough and slightly compressible.

Surface: Smooth to touch, uneven. Oscules and pores invisible.

Ectosome and Endosome: Reticulation of anastomosing tough spongin fibers. Only main ascending fibers are cored with stout subtylostyles, and echinated by short acanthostyles. Numerous long stout subtylostyles protrude at tips of all ascending fibers, and numerous slender subtylostyles are arranged horizontally on tips of protruding tracts of long subtylostyles. Spongin fibers are irregularly reticulated and echinated with short acanthostyles at central

part of trunk and branches, but not cored with stout subtylostyles. Toxa exist in groups or are scattered in flesh, and isochelae lie scattered.

Spicule: Stout Subtylostyle; Slender Subtylostyle; Acanthostyle; Toxon; and Isochela.

Stout Subtylostyle — Nearly straight or gently curved, tapering from middle to pointed end, base spherically and slightly swollen with several blunt spines. It is possible divide spicules of this form into two length categories. Short ones are cored in spongin fibers of endosome and long ones protrude at tips of ascending fibers, but there is some overlap between these two categories. Size range

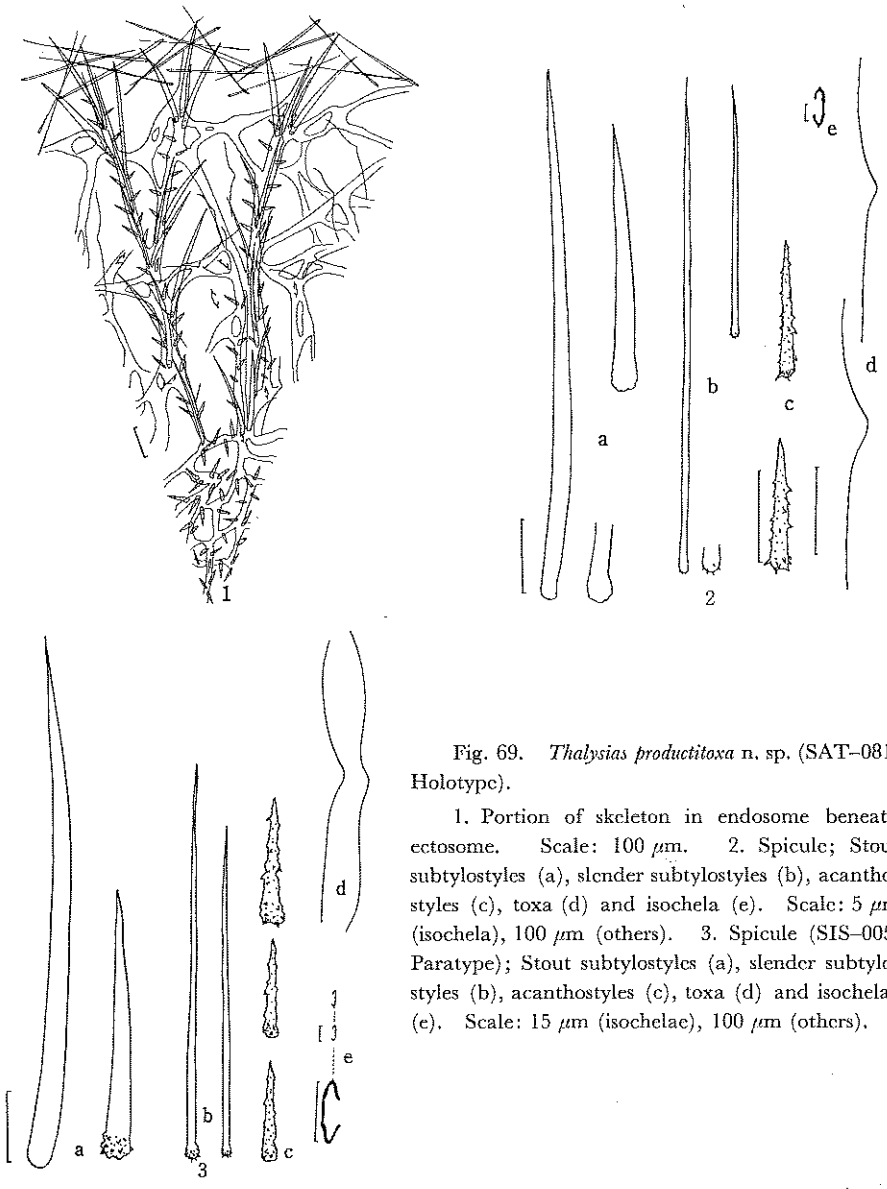


Fig. 69. *Thalysias productitoxa* n. sp. (SAT–081, Holotype).

1. Portion of skeleton in endosome beneath ectosome. Scale: 100 μm. 2. Spicule; Stout subtylostyles (a), slender subtylostyles (b), acanthostyles (c), toxa (d) and isochela (e). Scale: 5 μm (isochela), 100 μm (others). 3. Spicule (SIS–005, Paratype); Stout subtylostyles (a), slender subtylostyles (b), acanthostyles (c), toxa (d) and isochelae (e). Scale: 15 μm (isochelae), 100 μm (others).

205×10 to 700×15 μm (SAT–018).
Slender Subtylostyle — Nearly straight, base very slightly enlarged and weakly spinulated with several spines. Size range 335×4 to 600×7 μm (SAT–018).
Acanthostyle — Short, conical, straight or gently curved, strongly spined throughout length. Size range 95×8 to 170×12 μm (SAT–018).
Toxon — Thin, very long, hair-like, measuring up to 300 μm long, less than 1 μm thick (SAT–018).
Isochela — Small, palmate type, measuring 15 μm long (SAT–018).
Note:

	Dimensions of specimen	Spicule measurements	
		Stout Subtylostyle	Slender Subtylostyles
SAT–018	11 cm high	205×15 to 700×15	335×4 to 600×7
SAT–019	12.5 cm high	220×15 to 517×16	220×4 to 600×7
SIS–005	9×11×7 (height) cm	190×15 to 800×30	325–382–470×4–6–8
SIS–018	2×2×3 cm	370–464–590×18–21–28	330–414–580×3–5–8

Spicule measurements		
Acanthostyle	Toxon	Isochela
90×8 to 170×12	up to 300 long, less than 1 thick	15
80×10 to 95×10	300–400 long	15
80–88–100×8–10–11	up to 300 long, about 0.5 thick	18
78–87–104×7–11–14	up to 320	16

Remarks: This species is characterized by having extremely long toxa.

Genus *Thalyseurypon* De Laubenfels, 1936

103. *Thalyseurypon kasumiensis* (Tanita, 1965)

(Fig. 70)

Raspailia kasumiensis Tanita, 1965b, p. 67, figs. 1–2; Hoshino, 1970, p. 23, fig. 3(2), fig. 2(4); 1971, p. 24.

Material examined: SIS–052, Mukaishima, 16–V–1969; JAP–028, Kurotsusaki, 5–XI–1977.
Dimensions: 0.6×0.8×5.0 (height) cm, (SIS–052).
Habitat: Subtidal zone, 3–5 m in depth, on muddy bottom.
Shape: Erect, ramose, with several branches emanating from single stem, or amorphous massive, composed of irregularly anastomosing branches. Stem and branches are slightly compressed, and less than 0.8 cm in diameter.
Color: Ivory Buff 04EB or Isabella Color 05GC.
Consistency: Slightly compressible and fairly tough.
Surface: Minutely hispid, lipostomous and even. Oscules and pores invisible.

Ectosome: No special dermal structure of skeleton.

Endosome: Reticulation of ascending fibers and secondary fibers. Primary ascending fibers are cored with numerous styles of well developed horny material, 20–60 μm in diameter. These fibers are connected with irregularly reticulated secondary fibers, cored with one to several rows of styles in horny fibers, 10–20 μm in diameter. Small acanthostyles echinate in places along each fibers.

Spicule: Stout Style; Slender Style; and Small Acanthostyle.

Stout Style — Stout, smooth, straight or very slightly arched, tapering slightly from middle to each end, with base rounded and other end sharply pointed. Size range 216–247–300 × 10–13–18 μm (SIS–052).

Slender Style — Slender, smooth, straight or slightly arched, base rounded with other end sharply pointed. Size range 165–239–295 × 5–6.5–9 μm (SIS–052).

Small Acanthostyle — Small, straight, conical, rough throughout length. Size range 80–88–93 × 5–6–6 μm (SIS–052).

Distribution: In Japan — Kasumi; Inland Sea of Japan.

Note:

	Dimensions of specimen	Spicule measurements
		Stout Style
SIS–052	0.6 × 0.8 × 5 cm	216–247–300 × 10–13–18
JAP–028	12 × 10 × 5	245–271–340 × 12–13.5–16

Spicule measurements	
Slender Style	Small Acanthostyle
165–239–295 × 5–6.5–9	80–88–93 × 5–6–6
160–236–290 × 5–6–9	90–95 × 5–8

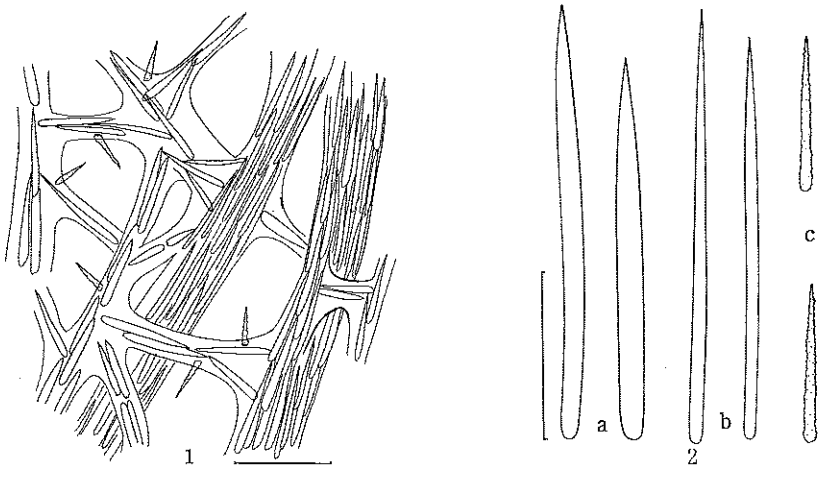


Fig. 70. *Thalyseurypon kasumiensis* (Tanita). (SIS–052).

1. Portion of skeleton in endosome. Scale: 200 μm. 2. Spicules; Stout styles (a), slender styles (b) and acanthostyles (c). Scale: 100 μm.

Remarks: This species was first described from Kasumi in the Sea of Japan as belonging to the genus *Raspailia*, but the skeletal structure in this species is not that of the order Axinellida. It is more appropriate to allocate this sponge to a genus in the family Microcionidae, and the writer selects the genus *Thalyseurypon* for this species.

Family Ophilitaspongiidae De Laubenfels, 1936

Genus *Clathria* Schmidt, 1862

104. *Clathria fasciculata* Wilson, 1925

Clathria fasciculata Wilson, 1925, p. 442, Pl. 42, fig. 6, Pl. 49, figs. 7–8; De Laubenfels, 1954a, p. 140, t-fig. 89; Tanita, 1963, p. 124; 1968, p. 47; Hoshino, 1971, p. 24.

Distribution: Celebes; Palau; Truk Island.
In Japan — East coast of Noto Peninsula; Ariake Sea.

105. *Clathria frondifera* (Bowerbank, 1875)

Halichondria frondifera Bowerbank, 1875, p. 288.
Clathria frondifera: Ridley, 1884, p. 448, Pl. 2, fig. 1, Pl. 53, fig. j; Ridley et Dendy, 1887, p. 149; Topsent, 1893, p. 21; Lindgren, 1897, p. 480; 1898 p. 309; Dendy, 1905, p. 170.
Clathria coralitincta Dendy, 1889, p. 85, Pl. 4, fig. 8; 1916b, p. 128; 1921a, p. 65.
Tenacia frondifera: Burton et Rao, 1932, p. 337; Burton, 1934b, p. 559.
Thalysias frondifera: De Laubenfels, 1954a, p. 138, t-fig. 88.

Distribution: Ceylon; Amirante; Red Sea; Malacca Strait; East Australia; Seychelleri.
In Japan — Shirahama.

106. *Clathria shirahama* Tanita, 1977

Clathria shirahama Tanita, 1977, p. 38, Pl. 2, fig. 9, t-fig. 6.

Distribution: In Japan — Shirahama.

107. *Clathria spinispicula* Tanita, 1968

Clathria spinispicula Tanita, 1968, p. 48, Pl. 1, fig. 6, t-fig. 8.

Distribution: In Japan — Ariake Sea

Genus *Esperiopsis* Carter, 1882

108. *Esperiopsis variussigma* n. sp.

(Fig. 71; Pl. 7, Fig. 4)

Material examined: SAT–065–1 (Holotype), Uchinoura, 5–XI–1975.

Dimensions: $5 \times 5 \times$ less than 0.1 (thickness) cm.

Habitat: Subtidal zone, on surface of dead coral.

Shape: Very thin encrusting sponge, less than 0.1 cm in thickness, on surface of dead coral, or on inside surface of small cavities.

Color: Violet 47PA.

Consistency: Unrecognizable.

Surface: Unrecognizable.

Ectosome and Endosome: Ectosome could not be discriminated from endosome. Coarse irregular reticulation of tracts of subtylostyles, and numerous microsclercs of various kinds are found in the flesh which is densely packed with chromatophores (?).

Spicule: Subtylostyle; Various kinds and sizes of Sigma; and Two kinds of Isochela.

Subtylostyle — Smooth, nearly straight or very slightly sinuous or sinuous, base simply rounded or slightly swollen and elongated, of nearly constant width throughout length, and with other end sharply pointed. Size range 330–371–485 $\times$ 4–7–11 μm.

Sigma — Variable, large to small, thick to thin, strongly rounded to C-shaped or to strongly compressed, measuring 239 $\times$ 8 μm in thick ones, or 70 $\times$ 3 μm in normal C-shaped, or 85 $\times$ 3 μm in elongated C-shaped, or 50 $\times$ 5 μm in strongly compressed (maximum dimension $\times$ shaft width).

Isochela — Common palmate type and small palmata type with large aela, measuring 100–105 μm and about 40 μm long.

Remarks: This species is characterized by having sigmata of variable morphology and size.

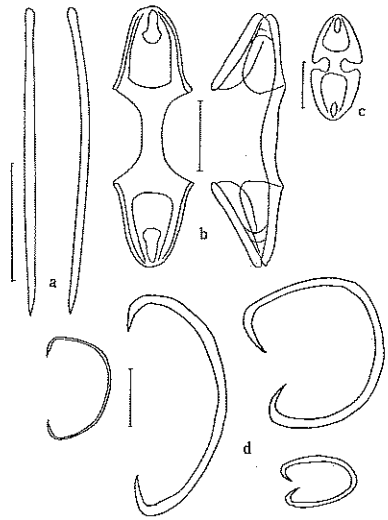


Fig. 71. *Esperiopsis variussigma* n. sp. (SAT–065–1, Holotype).

Spicule; Subtylostyles (a), large isochelae (b), small isochela (c) and sigmata (d). Scale: 150μm (subtylostyles), 30 μm (large isochelae), 20 μm (small isochela), 50 μm (sigmata).

Genus *Litaspongia* De Laubenfels, 1954

109. *Litaspongia arborea* Tanita, 1968

Litaspongia arborea Tanita, 1968, p. 49, Pl. 2, fig. 7, t-fig. 9.

Distribution: In Japan — Ariake Sea

Genus *Mycale* Gray, 1867

110. *Mycale adhaerens* (Lambe, 1893)

(Fig. 72)

Esperella adhaerens Lambe, 1893, p. 27, Pl. 2, figs. 5 and 5 (a–d); 1894, p. 117, Pl. 2, figs. 5 and 5 (a–f); Hentschel, 1929, p. 931; Burton, 1935a, p. 69

Mycale adhaerens: Koltun, 1959, p. 62, Pl. 2, fig. 2, t-fig. 18.

Material examined: SAT-024-1, Uchinoura, 5-XI-1975.
Dimensions: $1 \times 1 \times 0.2$ (thickness) cm.
Habitat: Subtidal zone, on surface of coral.
Shape: Small, thin encrusting sponge.
Color: White when dry.
Consistency: Hard.

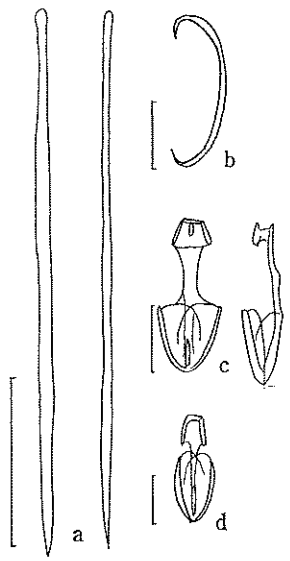


Fig. 72. *Mycale adhaerens* (Lambe). (SAT-024-1).

Spicule; Subtylostyles (a), sigma (b), large anisochelae (c) and small anisochela (d). Scale: 150 μm (subtylostyles), 10 μm (small anisochela), 20 μm (others).

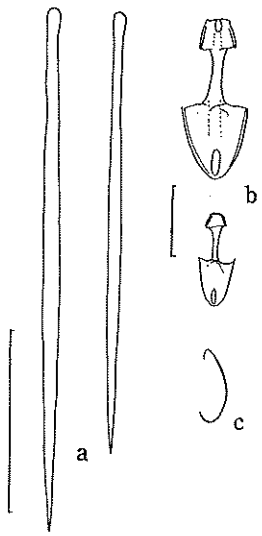


Fig. 73. *Mycale adhaerens nullarosette* n. subsp. (SIS-071, Holotype).

Spicule; Subtylostyles (a), anisochelae (b) and sigma (c). Scale: 100 μm (subtylostyles), 20 μm (others).

Surface: Smooth, uneven, oscules and pores invisible.

Ectosome: Confused arrangement of subtylostyles, or, in places, irregular reticulation of vague tracts of subtylostyles.

Endosome: Irregular reticulation of well developed and vague ascending tracts, and, in places, confused arrangement of subtylostyles. Secondary tracts scarcely develop. Rosettes of large anisochelae and sigmata exist in the flesh.

Spicule: Subtylostyle; Two categories of Anisochela; and Sigma.

Subtylostyle — Smooth, slightly sinuous or nearly straight, base slightly elongated and enlarged, with other end abruptly pointed. Size range 440–485–545 × 8–10–12 μm.

Anisochela — Palmate type, two size modes. Large anisochela 55 μm in total length, large alae about 30 μm long, 10 μm wide and small alae 15 μm long, 10 μm wide, and shaft 4–5 μm wide. Small anisochela about 20 μm in total length.

Sigma — C-shaped, 40–70 μm in length.

Distribution: Pacific coast of Canada.

In Japan — Newly recorded.

Remarks: The present specimen differs from description of this species given in Lambe (1894), Burton(1935) and Koltun (1959) in that raphides were not found.

111. *Mycale adhaerens nullarosette* n. subsp.

(Fig. 73; Pl. 7, Fig. 5)

Material examined: SIS–071 (Holotype), Mukaishima, 14–XI–1969; JAP–026, Kurotsusaki, 5–X–1977; JAP–033, Iwaya, 20–VI–1977.

Dimensions: 7 × 7 × 4 (thickness) cm, (SIS–071).

Habitat: Intertidal zone, low tide subzone.

Shape: Irregular massive or thick encrusting sponge, occasionally with several elongated lobes.

Color: Maple 07GD or Dark Greenish Glaucous 90GD.

Consistency: Elastic, but not very tough.

Surface: Conulose, conules 1–3 mm high, 1–4 mm apart. Oscules 3–4 mm in diameter opening at summits of several lobes. Pores invisible.

Ectosome: Irregular reticulation of tracts, densely packed with subtylostyles, and fairly confused arrangement between reticulation. These tracts are 80–100 μm in diameter. Numerous microscleres scatteres in the flesh.

Endosome: Mainly irregular reticulation of well developed primary tracts, densely packed with subtylostyles, 70–80 μm in diameter, which branch repeatedly or run together. These primary tracts are connected in places with secondary tracts at right angles. Confused arrangement of subtylostyles exist between these reticulation. Numerous microscleres are scattered in the fleshy membrane between reticulation.

Spicule: Subtylostyle; Two categories of Anisochela; and Sigma.

Subtylostyle — Nearly straight, smooth, tapering from middle to each end, base

elongated and slightly swollen, with other end sharply pointed. Size range 255–292–315 × 5–6–7 μm (SIS–071).
Anisochela — Palmate type, about 25 μm and about 45 μm in length (SIS–071).
Sigma — Very thin, small C-shaped, 25 μm in maximum dimension (SIS–071).
Note:

	Dimensions of specimen	Spicule measurements		
		Subtylostyle	Anisochela	Sigma
SIS–071	7 × 7 × 4 cm	255–292–315 × 5–6–7	25 and 45	25
JAP–026	2 × 2 × 4	210–256–285 × 3–5–6	13 and 35	18–22
JAP–033	8 × 5 × 5	210–281-320 × 4–5.6–8	14–28	18–25

Remarks: This subspecies differs from *Mycale adhaerens* in having no rosettes of anisochelae.

112. *Mycale adhaerens parvasigma* n. subsp.

(Fig. 74; Pl. 7, Fig. 6)

Material examined: MIT–040, MIT–044, Mitsukue, 5–XI–1975; JAP–014 (Holotype), Usa, 12–VI–1976.
Dimensions: 13 × 12 × 7 cm, (JAP–014).
Habitat: Intertidal zone or subtidal zone, on holdfasts of *Ecklonia* or on rocky substrate.
Shape: Irregular thin encrusting or irregular massive sponge with low irregular branches covering entire surface.
Color: Raw Sienna 08PE or Ivory Buff 04EB when dry.
Consistency: Incompressible or slightly compressible.
Surface: Smooth to touch, and markedly uneven on specimens with protruding branches. Oscules, 0.8–1.8 mm in diameter, scattered on surface. Pores invisible.
Ectosome: Coarse, confused reticulation of spicule tracts which contain several to ten or more rows of subtylostyles. Numerous microscleres of all kinds are present in the flesh, and small anisochelae and sigmata are especially abundant.
Endosome: Coarse, confused reticulation of spicule tracts which contain several rows of subtylostyles, and very vague tracts of 50–90 μm in diameter which ascend and anastomose. Numerous microscleres of all kinds scattered in the flesh, with large anisochelae present as rosette of about 100 μm in diameter.
Spicule: Subtylostyle; Two categories of Anisochela; and Sigma.
Subtylostyle — Smooth, nearly straight, base slightly elongated and swollen, tapering from middle to each end, with other end sharply pointed. Size range 320–371–395 × 6–10–12 μm (JAP–014).
Anisochela — Large anisochela, palmate type, 42–52 μm long. Small an-

isochela, palmate type, large flux greatly expanded to reach small flux, 20–25 μm long (JAP–014).
Sigma — Small, thin, 17–22 μm long (JAP–014).
Note:

	Dimensions of specimen	Spicule measurements		
		Subtylostyle	Anisochela	Sigma
MIT–040	2×1×1 cm	260–272–285×3–5–6	40 and 15	26
MIT–044	5×4×3	285–304–318×7–7.5–8	42 and 18	26
JAP–014	13×12×7	320–371–395×6–10–12	42–52 and 20–25	17–22

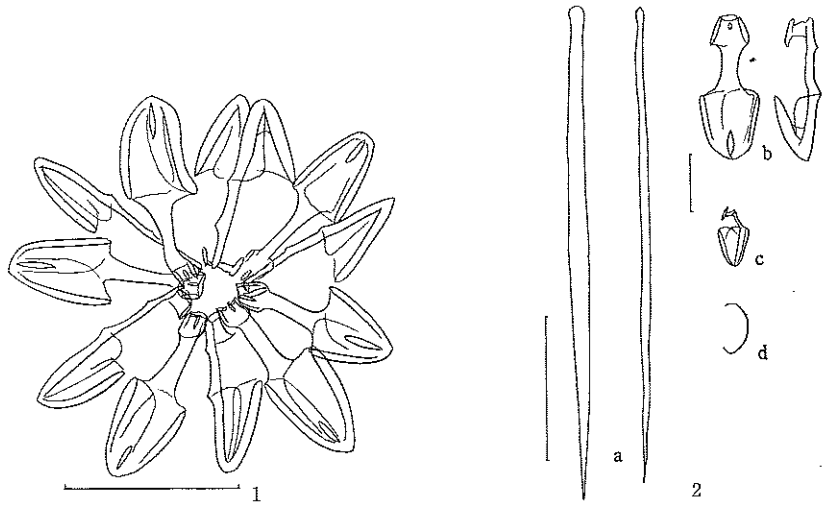


Fig. 74. *Mycale adhaerens parvasigma* n. subsp. (JAP–014, Holotype).
1. Rosette of large anisochelae. Scale: 50 μm. 2. Spicule; Subtylostyles (a), large anisochelae (b), small anisochela (c) and sigma (d). Scale: 100 μm (subtylostyles), 20 μm (others).

Remarks: This subspecies differs from *Mycale adhaerens* in having much smaller sigmata.

113. *Mycale aegagropila* (Johnston, 1842)

Halichondria aegagropila Johnston, 1842, p. 119, Pl. 2, figs. 1–2.
Esperella aegagropila: Vosmaer et Pekelharing, 1898, p. 19.
Mycale aegagropila: Wilson, 1925, p. 426; Tanita, 1968, p. 50.

Distribution: Philippines; England.
In Japan — Ariake Sea.

114. *Mycale lingua* (Bowerbank, 1866)

(Fig. 75; Pl. 7, Fig. 7)

Hymeniacidon lingua Bowerbank, 1866, p. 187
Mycale lingua: Koltun, 1959, p. 60; Bakus, 1966, p. 453.

Material examined: SIS–038, Sasajima, 27–VIII–1969; SIS–154, Sasajima, 21–I–1976.

Dimensions: $2.5 \times 3 \times 4$ (thickness) cm, (SIS–038).

Habitat: Intertidal zone, low tide subzone, on rocky substrate.

Shape: Irregular massive, or irregular thick encrusting sponge, or occasionally lobate.

Color: Apricot Yellow 05IA or Orange Yellow 05PA or Golden Yellow 08PB.

Consistency: Slightly compressible, and not very tough.

Surface: Smooth to touch, and very minutely conulose. Oscules and pores invisible.

Ectosome: Confused, horizontal arrangement of subtylostyles with numerous confused raphides, in rich fleshy substance.

Endosome: Well developed, thick, subtylostyle tracts ascend and ramify from base to surface expanding beneath ectosome. These tracts are 300–500 μm in diameter. Numerous microscleres— large anisochelae in rosette, raphides in trichodragma, and free small anisochelae and sigmata— are found in the flesh or near ascending tracts.

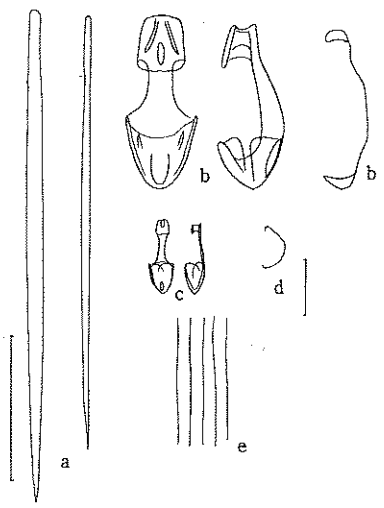


Fig. 75. *Mycale lingua* (Bowerbank). (SIS–038).

Spicule; Subtylostyles (a), large anisochelae (b), small anisochelae (c), sigma (d) and raphides (e). Scale: 150 μm (subtylostyles), 20 μm (others).

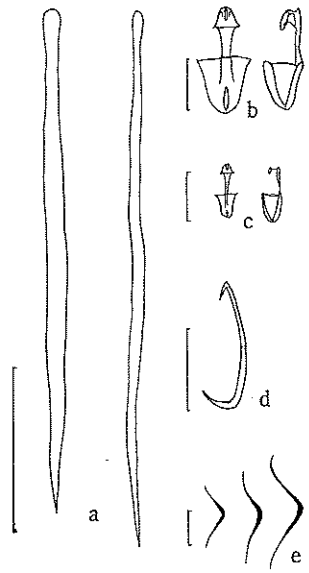


Fig. 76. *Mycale macginitiei* De Laubenfels. (SIS–002).

Spicule; Subtylostyles (a), large anisochelae (b), small anisochelae (c), sigma (d) and toxa (e). Scale: 100 μm (subtylostyles), 50 μm (sigma), 20 μm (others).

Spicule: Subtylostyle; Two forms of Anisochela; Sigma; and Raphide.
Subtylostyle— Smooth, almost straight, tapering from middle to each end, base slightly elongated and swollen, with other end sharply pointed. Size range 400–541–585 × 8–9–10 μm (SIS–038).
Large Anisochela— Palmo-dentate type, 55–65 μm long, shaft 8–10 μm wide. Rosettes are compactly arranged, with large end directed outward, are spherical, about 150 μm in diameter, and are abundant in endosome (SIS–038).
Small Anisochela- Palmate type, about 15 μm long (SIS–038).
Sigma— Small, C-shaped, 10–15 μm in maximum dimension (SIS–038).
Raphide— Exist as trichodragma. Straight, smooth, 50–60 μm long and 0.4–0.5 μm wide (SIS–038).
Distribution: Cosmopolitan.
In Japan— Newly recorded.
Note:

	Dimensions of specimen	Spicule measurements
		Subtylostyle
SIS–038	2.5 × 3 × 4 cm	400–541–585 × 8–9–12
SIS–154	5 × 4 × 3	510–547–575 × 7–9.3–11

Spicule measurements			
Large Anisochela	Small Anisochela	Sigma	Raphide
50–65	15	10–15	50–60 × 0.4–0.5
55–56	22–25	14–15	50–60 × 0.4–0.5

115. *Mycale macginitiei* De Laubenfels, 1930

(Fig. 76)

Mycale macginitiei De Laubenfels, 1930, p. 26; 1932, p. 68, fig. 36; Tanita, 1958, p. 132, Pl. 2, figs. 7–9, t-fig. 4; 1968, p. 51; Rho *et al*, 1969, p. 158, Pl. 2, figs. 11–12, t-fig. 4; Hoshino, 1971, p. 24; 1975b, p. 14, Pl. 2, figs. 1–5.

Material examined: SIS–002, Mukaishima, 10–X–1973; SIS–125, SIS–130, Sasajima, 11–VI–1975.
Dimensions: 10 × 27 × 10 (height) cm, (SIS–002).
Habitat: Intertidal zone, low tide subzone.
Shape: Irregular massive sponge with numerous irregular, compressed cactoid projections, or irregular thin encrusting sponge with several protrubences.
Color: Ecru 08ED or Ivory Buff 04EB or Deep Violet Plumbeous 50HE or Sulphine Yellow 03LC.
Consistency: Incompressible, not tough.
Surface: Minutely conulose as cactoid surface, or smooth and wrinkled. Oscules and pores invisible.

Ectosome: Dense, confused horizontal arrangement of subtylostyles, and in places tracts of subtylostyles weakly develop. Numerous microscleres present in fleshy dermis.

Endosome: Irregular reticulation of moderately developed tracts of subtylostyles, which are densely packed with spicules, up to 150 μm in diameter, and which branch in places. Secondary tracts not developed. Confused arrangements also found in endosome. Microscleres scattered in the flesh or near tracts.

Spicule: Subtylostyle; Two categories of Anisochela; Sigma; and Toxon.

Subtylostyle— Smooth, nearly straight or slightly sinuous, base slightly swollen and elongated, with other end sharply pointed. Size range 265–295–310×4–8–10 μm (SIS–002).

Anisochela— Palmate type, 40 μm and 25 μm in length (SIS–002).

Sigma— C-shaped, 80 μm in length (SIS–002).

Toxon— Thin, 30–70 μm long, up to 1 μm wide (SIS–002).

Distribution: California; Korea Strait.

In Japan— Matsushima Bay; Inland Sea of Japan; Ariake Sea.

Note:

	Dimensions of specimen	Spicule measurements
		Subtylostyle
SIS–002	10×27×10 cm	265–295–310×4–8–10
SIS–125	5×5×1	255–279–308×5–6–8
SIS–130	4×4×0.1–0.3	270–288–315×4–7–10

Spicule measurements		
Anisochela	Sigma	Toxon
40 and 25	80	30–70
12 to 50	70–73	40 to 103
40–46 and 15–22	55–68	up to 80

Remarks: Previous workers have noted that rosettes of anisochelae are occasionally found (De Laubenfels, 1930, 1932; and Tanita, 1958), but such spicule arrangement was not found in the specimens examined in this study.

116. *Mycale magellanica* (Ridley, 1881)

(Fig. 77)

Esperia magellanica Ridley, 1881, p. 117, Pl. 10, fig. 5.

Esperella magellanica: Ridley et Dendy, 1887, p. 67.

Mycale magellanica: Thiele, 1905, p. 442; Topsent, 1913, p. 632, Pl. 4, fig. 4, Pl. 6, fig. 10; Dendy, 1924, p. 336; Burton, 1932, p. 288; Hoshino, 1976c, p. 5, Pl. 1, figs. 2–5.

(for further synonymy, see Burton, 1932)

Material examined: AR–1–7, Ariake Sea (near Aitsu M. B. S.), 16–V–1972.
Dimensions: $5 \times 5 \times 6.5$ (height) cm.
Habitat: Subtidal zone, 20 m in depth, on carbonate bottom.
Shape: Subspherical massive sponge, with a nearly hollow inner body cavity.
Color: Ochraceous Salmon 12GB or Corinthian Pink 21DA.
Consistency: Slightly tough, not very fragile.
Surface: Papillate, even. One oscule opens at summit of body and an additional one on side surface. Pores invisible.
Ectosome: Irregular reticulation of vague tracts of subtylostyles, about 400 μm in diameter.
Endosome: Very coarse reticulation of ascending tracts of subtylostyles, 70 μm in diameter. Thses tracts spread as a fan beneath ectosome to which they connect.
Spicule: Subtylostyle; and Anisochela.
Subtylostyle— Smooth, nearly straight or slightly sinuous, base slightly swollen with other end sharply pointed. Size range 450–492–535 × 9–11.2–13 μm.
Anisochela— Palmate type. Size range 50–54–65 μm in length.
Distribution: Sandy Point; Strait of Magellan; Cape Virgins; Punta Arenas; Admiraitats-Sund; Falkland Island; Graham Land; Victoria Land; Wilhelm Land.
In Japan— Ariake Sea.
Remarks: This pecies is characterized by its peculiar external form in the genus *Mycale*.

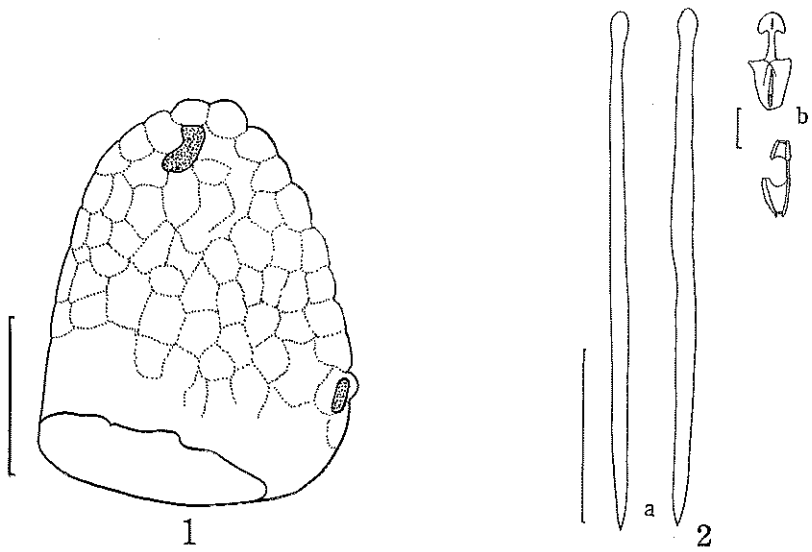


Fig. 77. *Mycale magellanica* (Ridley), (AR–1–7)
1. Entire animal. Scale: 3 cm. 2. Spicule; Subtylostyles (a) and anisochelae (b). Scale: 100 μm (subtylostyles), 20 μm (anisochelae).

117. *Mycale plumosa* (Catrer, 1882)

(Fig. 78)

Esperia plumosa Carter, 1882, p. 299.
Esperella plumosa: Dendy, 1905, p. 159; 1916, p. 121, Pl. 1, fig. 4 (a–g), Pl. 3, fig. 19.
Mycale plumosa: Tanita, 1958, p. 133, Pl. 2, figs. 10–11, t-fig. 5; 1969, p. 74; Kim *et al*, 1968, p.41, Pl. 3, fig. 13, t-fig. 4; Rho *et al*, 1969. p. 158; Hoshino, 1970, p. 23, fig. 2 (6), fig. 3 (7); 1971, p. 24.

Material examined: SIS–040, Mukaishima, 21–VI–1970; JAP–013, JAP–017, Usa, 12–VI–1976.

Dimensions: $4 \times 3 \times 6$ (height) cm, (SIS–040).

Habitat: Intertidal zone, low tide subzone.

Shape: Amorphous massive sponge, with a few or many irregular projections or anastomosing branches.

Color: Olive Ocher 04IC or Maple 08GD.

Consistency: Very soft or slightly compressible, and fragile.

Surface: Uneven, coarsely conulose, conules 2–3 mm high and 0.5–1.0 cm apart, or in places smooth and wrinkled. Oscules open at summit of each projection. Pores invisible.

Ectosome: Coarse, irregular reticulation of thin vague tracts of subtylostyles, and in places fairly dense confused arrangement of spicules. Vague tracts are composed of three to five rows of subtylostyles. Numerous microscleres are found in fleshy dermis.

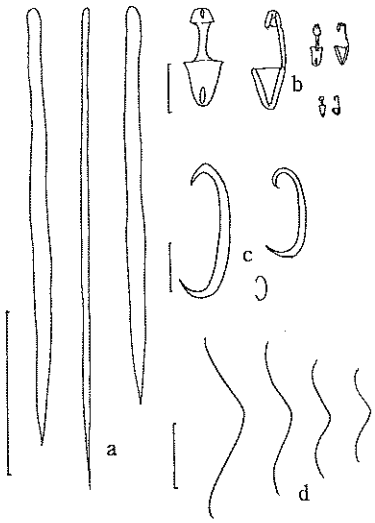


Fig. 78. *Mycale plumosa* (Carter). (SIS–040).

Spicule; Subtylostyles (a), anisochelae (b), sigmata (c) and toxa (d). Scale: 100 μm (subtylostyles), 20 μm (others).

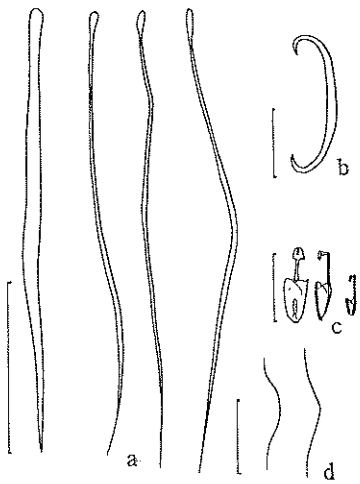


Fig. 79. *Mycale tenuisinuositylostyli* n. sp. (SIS–031, Holotype).

Spicule; Tylostyles (a), sigma (b), anisochelae (c) and toxa (d). Scale: 100 μm (tylostyles), 40 μm (sigma), 20 μm (anisochelae), 50 μm (toxa).

Endosome: Tracts of 30–100 μm in diameter, densely packed with subtylostyles, ascend ramifying to surface, and in other portion of tracts numerous spicules confusedly arrange with microscleres in the flesh.

Spicule: Subtylostyle; Sigma; Anisochela; and Toxon, all of various sizes.
Subtylostyle— Smooth, almost straight or gently sinuous, base slightly elongated and swollen, other end sharply pointed. Size range 215–278–310×4–6–7 μm and 7–10 μm long by 4–6 μm wide at the swollen base (SIS–040).
Sigma— C-shaped and occasionally S-shaped, varying greatly in size, segregate into three apparent size categories given as follows: 60–70×5 μm; 20–25×1–3 μm; and less than 10 μm long (SIS–040).
Anisochela— Palmate type, widely varied in size, and segregate into three apparent size categories given as follows: about 40 μm; about 20 μm; and less than 10 μm long (SIS–040).
Toxon— Greatly variable in size, 30–180 μm long (SIS–040).

Distribution: Mauritius and Mergui Archipelago; Okhamandal; Korea Strait.

In Japan— Matsushima Bay; Aikawa; Inland Sea of Japan.

Note:

	Dimensions of specimen	Spicule measurements	
		Subtylostyle	Sigma
SIS–040	4×3×6 cm	215–278–310×4–6–7	70–60×5 20–25×1–3 and less than 10
JAP–013	10×9×6	236–271–295×7–8–9	65–70, 18 and less than 10
JAP–017	6×6×7	248–278–320×6–7.6–9	60–75, 18 and less than 10

Spicule measurements	
Anisochela	Toxon
ca. 40 ca. 20 and less than 10	30–180
11–45	up to 180
16–46	up tp 180

Remarks: This species is common in Japanese waters and is characterized by having various sizes of sigmata and of anisochelae.

118. *Mycale tenuisinuositylostyli* n. sp.

(Fig. 79; Pl. 7, Fig. 8)

Material examined: SIS–031 (Holotype), Onomichi, 15–V–1970.
Dimensions: 3×5×0.5 (thickness) cm.
Habitat: Intertidal zone, on sides of floating concrete piers.

Shape: Irregular thin encrusting sponge.

Color: Ivory Buff 04EB.

Consistency: Slightly compressible, but incompressible and fragile when dry.

Surface: Smooth to touch, minutely undulated. Oscules and pores invisible.

Ectosome: Coarse, irregular, horizontal arrangement of tylostyles, about 20 μm thick, with anisochelae scattered in the flesh.

Endosome: Numerous vague tracts, composed of numerous rows of tylostyles, which meander as they ascend from inner part to surface, and ramify to support ectosome. These tracts are 50–300 μm in diameter. Numerous microscleres, anisochelae, sigmata, and toxa, scattered in the flesh and near tracts.

Spicule: Tylostyle; Sigma; Two categories of Anisochela; and Toxon.

Tylostyle— Smooth, straight, or strongly or gently curved, or slightly sinuous, or greatly bent, thin and occasionally thick, base slightly swollen and elongated, becoming slender at neck of base, with other end sharply pointed. Size range 220–254–285 × 3–5–10 μm.

Sigma— Normal C-shaped or twisted S-shaped, 75–80 μm in total length, and 5 μm thick.

Anisochela— Palmate type, two size modes, 25 μm and 12 μm long.

Toxon— Smooth, very thin, each end sharply pointed and recurved, 80–100 μm long and up to 2 μm thick.

Remarks: This species is characterized by having thin, sinuous tylostyles.

Genus *Ophilitaspongia* Bowerbank, 1864

119. *Ophilitaspongia noto* Tanita, 1963

Ophilitaspongia noto Tanita, 1963, p. 124, Pl. 4, fig. 3, t-fig. 3; 1964, p. 17, Pl. 1, fig. 4; 1965, p. 48; Kim *et al*, 1968, p. 41, Pl. 3, fig. 12, t-fig. 13; Rho *et al*, 1969, p. 158.

Distribution: Korea Strait.

In Japan— Noto Penisnula; Tsukumo Bay; Aikawa.

Genus *Paresperella* Dendy, 1905

120. *Paresperella macrosigma* (Lindren, 1897)

Esperella macrosigma Lindgren, 1897, p. 482; 1898, p. 301, Pl. 19, fig. 12 (a–d).
Paresperella macrosigma: Tanita, 1961, p. 135, Pl. 4, figs. 8–9, t-fig. 5.

Distribution: Korea Strait.

In Japan— Wagu

121. *Paresperella undulata* Tanita, 1968

Paresperella undulata Tanita, 1968, p. 50, t-fig. 10.

Distribution: In Japan— Ariake Sea.

Family Amphilectidae De Laubenfels, 1936

Genus *Amphilectus* Vosmaer, 1880

122. *Amphilectus fucorum* (Esper, 1794)

(Fig. 80)

Spongia fucorum Esper, 1794, p. 278, Pl. 49, figs. 1–2.
Aephilectus fucorum: Burton, 1932, p. 289, Pl. 65, figs. 1–4; Tanita, 1964. p. 18, Pl. 1, fig. 5, t-fig. 1.
(for detailed synonymy, see Burton, 1932)

Material examined: SIS–006, SIS–008, SIS–017, Hosonosu, 6–XI–1971; SIS–026, Mukaishima, 28–II–1970; SIS–047, SIS–141, Mukaishima, I–VII–1975. MIT–036, MIT–045, Mitsukue, 5–XI–1975.

Dimensions: $9 \times 2 \times 6$ (thickness) cm, (SIS–006).

Habitat: Intertidal or subtidal zone, on muddy bottom or on a holdfast of *Ecklonia*.

Shape: Small irregular massive on hodlfasts of the brown alga *Ecklonia*, or irregular ramose sponge with several, strongly compressed branches originating from single basal stem. Branches spreading out from basal stem in a single plane, with each branch compressed in the branching plane. Basal stem is oval in cross section with long axis reaching to approximately 0.5 cm.

Color: Pinkish Cinnamon 08GB, Orange Rufous 13NC, or Red Orange 220A.

Consistency: Almost incompressible, fragile.

Surface: Rough to touch, very minutely conulose. Oscules and pores invisible.

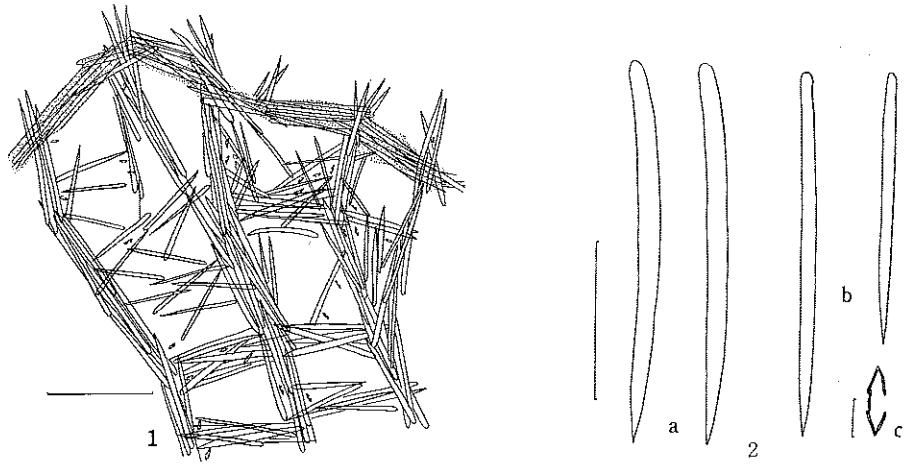


Fig. 80. *Amphilectus fucorum* (Esper). (MIT–036).
1. Portion of skeleton in endosome beneath ectosome. Ectosome: Upper. Scale: 200 μm.
2. Spicule; Stout styles (a), slender styles (b) and isochela (c). Scale: 10 μm (isochela), 100 μm (others).

Ectosome: Irregular reticulation of tracts containing styles, which are common to the outermost secondary tracts.

Endosome: Irregular reticulation of primary and secondary tracts. Primary tracts, which are arranged with styles pointing towards the surface, ascend to surface. These tracts are connected with secondary tracts at irregular intervals. Spicules are not arranged in a regular direction in the secondary tracts. Numerous styles are found in the flesh, not associated with tracts.

Spicule: Two categories of Style; and Isochela.

Stout Style— Stout, smooth, straight or slightly arched, base slightly elongated and rounded, of nearly constant width throughout length, with other end abruptly and sharply pointed. Size range 220–246–280 × 13–14–15 μm (SIS–006).

Slender Style— Slender, smooth, straight or slightly arched, base rounded with other end sharply pointed. Size range 180–219–260 × 6–6.5–7 μm (SIS–006).

Isochela— Palmate type, about 20 μm long (SIS–006).

Distribution: Cosmopolitan.

In Japan— Tsukumo Bay.

Note:

	Dimensions of specimen	external form	Spicule measurements
			Stout Style
SIS–006	9 × 2 × 6 cm	ramose	220–246–280 × 13–14–15
SIS–008	7 × 1 × 6	irregular ramose	210–262–290 × 9–12.5–16
SIS–017	5 × 4 × 12	ramose	240–262–320 × 12–15–18
SIS–026	4 × 3 × 4	irregular ramose	260–289–325 × 13–15–18
SIS–047	2 × 2 × 4	irregualr ramose	230–273–310 × 11–15–18
MIT–036	2 × 1 × 1	samll massive	240–254–265 × 12–14–15
MIT–045	3 × 4 × 3	irregular massive	240–267–325 × 12–14.6–17

Spicule measurements	
Slender Style	Isochela
180–219–260 × 6–6.5–7	20
110–232–310 × 5–6–7	20
120–235–285 × 5–7.5–10	20
155–245–310 × 6–7–8	17
150–254–390 × 5–7.5–10	20
215–245–290 × 5–7–8	20
135–204–305 × 6–8–10	18

Remarks: See Burton (1932) for full synonymy of this species.

Order Halichondrida Vosmaer, 1885 sensu Levi, 1955 and 1956

Family Halichondriidae Gray, 1867

Genus *Halichondria* Fleming, 1828

123. *Halichondria japonica* (Kadota, 1922)

(Fig. 81)

Reniera japonica Kadota, 1922, p. 705, fig. 1.
Halichondria japonica: Kim *et al*, 1968, p. 39, Pl. 1, fig. 5, t-fig. 6; Rho *et al*, 1969, p. 155; Hoshino, 1970, p. 22; 1971, p. 23; 1974, p. 10; 1976c, p. 6.

Material examined: SAT–046, SAT–073, SAT–077, Uchinoura, 5–XI–1975; AR–1–30, Matsushima Maeshima, 16–V–1972.

Dimensions: $7 \times 4 \times 1$ cm, (SAT–046)

Habitat: Intertidal to subtidal zone.

Shape: Thin encrusting or irregular massive, occasionally with abundant exhalent chimneys.

Color: Yellow Orange 10LA.

Consistency: Soft to touch, spongy, not very tough.

Surface: Minutely undulated. Oscules open at summit of chimneys. Pores invisible.

Ectosome: Confused, horizontal arrangement of styles.

Endosome: Coarse, confused arrangement of styles, and vague primary tracts developed to some extent.

Spicule: Style only— Smooth, straight or slightly arched, tapering from middle to each end, base rounded with other end sharply pointed. Size range 290–370–425 × 7–9–10 μm (SAT–046).

Distribution: Korea Strait.

In Japan— Sagami Bay; Inland Sea of Japan; Ariake Sea.

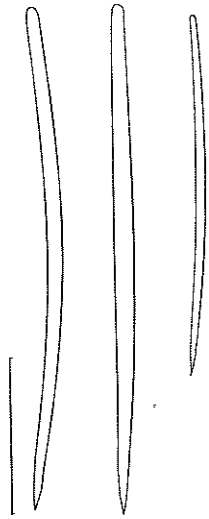


Fig. 81. *Halichondria japonica* (Kadota). (SAT–046).
Spicule; Styles. Scale: 100 μm.

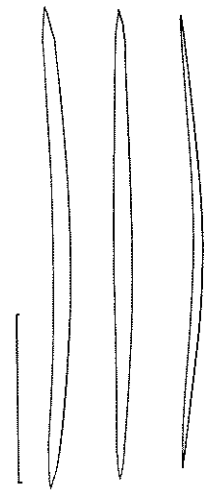


Fig. 82. *Halichondria panicea* (Pallas). (SIS–060).
Spicule; Oxea. Scale: 100 μm.

Note:

	Dimensions of specimen	External form	Spicule measurements
			Style
SAT–046	6× 4×1 cm	thin encrusting	290–370–425×7–9–10
SAT–073	5×10×8	irregular massive	320–458–630×6–9–12
SAT–077	5× 5×2	thin encrusting	150×3 to 350×7

(excluded the specimen from the Ariake Sea)

Remarks: This species is very abundant in the intertidal and shallow subtidal zones in Western Japan.

124. *Halichondria okadai* (Kadota, 1922)

Reniera okadai Kadota, 1922, p. 704, fig. 2.

Halichondria okadai: Tanita, 1964, p. 18, Pl. 1. fig. 6; Kim *et al*, 1968, p. 39, Pl. 1, fig. 6, t-fig. 7; Hoshino, 1970, p. 22; 1971, p. 23; 1974, p. 10.

Distribution: Korea Strait.

In Japan— Tsukumo Bay; Sagami Bay; Inland Sea of Japan; Ariake Sea.

125. *Halichondria oshoro* Tanita, 1961

Halichondria oshoro Tanita, 1961c, p. 185, t-figs. 3–4; Kim *et al*, 1968, p. 39, Pl. 2, fig. 7, t-fig. 8; Hoshino, 1975, p. 33, Pl. 2, figs. 2–3.

Distribution: Korea Strait.

In Japan— Hiwasa.

Remarks: This species was recorded by Hoshino (1975) from Hiwasa, but requires further examination for verification.

126. *Halichondria panicea* (Pallas, 1766)

(Fig. 82)

Spongia panicea Pallas, 1766

Halichondria panicea: Ridley et Dendy, 1887, p. 2, Pl. 2, figs. 2–3; Lambe, 1892, p. 67, Pl. 3, figs 1–2, Pl. 5, figs. 1 and 1(a), figs. 2 and 2(a–b); 1983, p. 25; 1895, p. 114; 1896, p. 182; Lendenfeld, 1897, p. 118; Dendy, 1916b, p. 112; 1921, p. 37; Babic, 1922, p. 220, fig. B; Wilson, 1925, p. 394; Burton, 1935a, p. 75; 1956, p. 136; 1959, p. 45; De Laubenfels, 1936b, p. 449; 1949a, p. 17, figs. 14–15; Dickinson, 1945, p. 29, Pl. 51, fig. 102, Pl. 52, fig. 103; Koltun, 1958, p. 70; 1959, p. 205, t-fig. 163, Pl. 36, fig. 2, Pl. 37, fig. 3; Tanita, 1958, p. 134, Pl. 3, figs. 11–15, t-fig. 6; 1963, p. 125; 1964, p. 18; 1968, p. 52; 1969, p. 75; Bergquist, 1961a, p. 41; 1970, p. 33, Pls. 7c and 19b; Kim *et al*, 1968, p. 40, Pl. 2, fig. 8, t-fig. 9; Rho *et al*, 1969, p. 155, Pl. 1, figs. 2–4; Descatoire, 1969, p. 198; Hoshino, 1970, p. 22; 1971, p. 23; 1974, p. 10; 1975b, p. 14. Pl. 1, figs. 4–6; 1976, p. 6.

Topsentia fibrosa Burton, 1935, p. 76.

Material examined: SIS–060, Onomichi Channel, 5–III–1972; SIS–075,

Sasajima, 25–VIII–1969; SIS–100, Mukaishima, 15–X–1975; SIS–104, SIS–109, Shijushima, 24–V–1975; SIS–110, Mukaishima, 25–V–1975; SIS–118, Ategishima, 8–IX–1975; SIS–158, Sasajima, 21–I–1976; SIS–161, Sasajima, 11–VI–1975; AR–1–6, AR–1–34, AR–1–35, Matsushima Maeshima, 16–V–1972; JAP–015, Usa, 12–VI–1976; JAP–023, Kurotsusaki, 5–XI–1977.

Dimensions: $2\times3\times2$ cm, (SIS–060).

Habitat: Intertidal zone, mid tide subzone, and deeper.

Shape: Thin or irregular encrusting, or irregular massive sponge, occasionally with exhalent chimneys.

Color: Grape Green 98IE or Orange Yellow 05PA or Cream Yellow 06GA.

Consistency: Compressible, not tough.

Surface: Smooth to touch, even or uneven, occasionally undulated. Oscules open at summit of chimneys or at the immediate surface in some places. Pores microscopic.

Ectosome: Confused, horizontal arrangement of oxea, or occasionally irregular reticulation of very vague tracts of oxea.

Endosome: Ascending but very vague tracts and confused arrangement of oxea.

Spicule: Oxeon only— Fusiform, smooth, straight to gently curved or slightly bent at middle, tapering to each end, with both ends sharply pointed. Size range 320–387–445 × 7–9–12 μm (SIS–060).

Distribution: Cosmopolitan.

In Japan— Throughout Coast of Japan.

Note: Dimensions, external forms and spicule measurements of representative specimens are as follows:

	Dimensions of specimen	External form	Spicule measurements
			Oxeon
SIS–060	$2\times3\times2$ cm	thin encrusting	320–387–445 × 7–9–12
SIS–075	$3\times2\times2$	encrusting with chimneys	265–317–340 × 7–9–11
JAP–015	$10\times7\times4$	irregular massive	350–392–440 × 6–8.3–10
JAP–023	$4\times2\times5$	irregular massive	228–267–300 × 6–7.4–9

Remarks: This species is a well-known cosmopolitan sponge.

127. *Halichondria sitiens* (Schmidt, 1870)

(Fig. 83)

Eumastia sitiens Schmidt, 1870, p. 42, Pl. 5, fig. 12; Lambe, 1895, p. 115; 1896, p. 182, Pl. 1, fig. 1; Burton, 1932, p. 200, Pl. 8, figs. 11–12; 1935, p. 76.

Pellina sitiens: De Laubenfels, 1957, p. 238; Tanita, 1958, p. 131, Pl. 1, fig. 5, Pl. 2, fig. 6, t-fig. 3; Hoshino, 1971, p. 23.

Halichondria sitiens: Koltun, 1958, p. 70; 1962b, p. 198; 1959, p. 206, t-fig. 164, Pl. 38, fig. 4.

Material examined: SIS–083, Mukaishima, 2–IX–1970.

Dimensions: 9×9×7 cm.

Habitat: In crevices of mussel mass attached to floating buoy.

Shape: Irregular massive sponge, with numerous thin branches from massive part, and branches irregularly ramifying and reaching 3–5 cm in length, and less than 3 mm in width.

Color: Ivory Buff 04EB.

Consistency: Compressible, soft, and not very tough.

Surface: Smooth to touch, not even and minutely undulated. Oscules and pores indistinct.

Ectosome: Coarse, confused, horizontal arrangement of oxea, with vague tracts of oxea, 40–120 μm in diameter, running almost parallel to each other and reticulate in branching, or running together. Thickness of ectosome 60–80 μm.

Endosome: Several vague thick tracts of oxea running parallel to surface and connected with irregular reticulation of oxea.

Spicule: Oxeon only— Smooth, hastate or occasionally fusiform, straight to slightly bent at the middle, tapering to sharply pointed ends. Size range 270–404–515×6–9.5–12 μm.

Distribution: Cosmopolitan.

In Japan— Sea of Japan; Matsushima Bay; Inland Sea of Japan.

Remarks: This species was originally described as *Eumastia sitiens* by Schmidt (1870) and subsequently transfered to the genus *Pellina* by De Laubenfels (1957). Koltun (1958) transfered this species to the genus *Halichondria*.

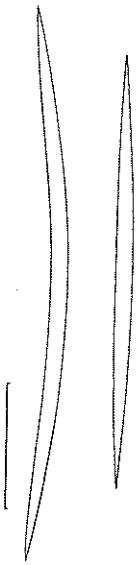


Fig. 83. *Halichondria sitiens* (Schmidt). (SIS–083).
Spicule; Oxea. Scale: 100 μm.

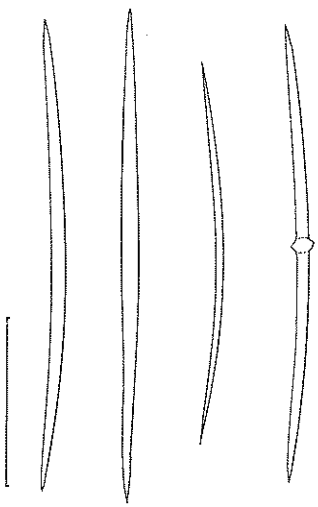


Fig. 84. *Halichondria surrubicunda* n. sp. (JAP–016, Holotype).
Spicule; Oxea. Scale: 100 μm.

128. *Halichondria surrubicunda* n. sp.

(Fig. 84; Pl. 8, Fig. 1)

Material examined: JAP-016 (Holotype), JAP-018, JAP-019, Usa, 12-VI-1976.

Dimensions: 13×8×6 cm, (JAP-016).

Habitat: Intertidal zone, mid tide subzone, on rocky substrate.

Shape: Irregular massive or irregular encrusting, with or without exhallent hollow cylinders.

Color: English Red 17LC.

Consistency: Very spongy, not very tough.

Surface: Smooth to touch, uneven. Oscules open at summit of hollow cylinders or at the surface in places. Pores scattered on entire surface.

Ectosome: Confused, horizontal arrangement or irregular reticulation of of very vague tracts of oxea.

Endosome: Confused arrangement of oxea and vague tracts ascend to surface in places.

Spicule: Oxeon only— Smooth, fusiform, straight to slightly arched, tapering to each end, with both ends sharply pointed. Size range 198–251–275×5–7–8 μm (JAP-016).

Note:

	Dimensions of specimen	External form	Spicule measurements
			Oxeon
JAP-016	13×8×6 cm	subspherical massive	198–251–275×5–7–8
JAP-018	4×2×6	irregular encrusting	260–351–480×3–8.4–12
JAP-019	7×2×3	irregular cencrusting	315–381–438×5–8.5–11

Remarks: This species resembles *Halichondria japonica* in external form and coloration, but differs in having only oxea as spicules.

Family Hymeniacidonidae De Laubenfels, 1936.

Genus *Acanthella* Schmidt, 1862

129. *Acanthella minuta* Tanita, 1968

Acanthella minuta Tanita, 1968, p. 53, Pl. 2, fig. 10, t-fig. 13.

Distribution: In Japan— Ariake Sea.

130. *Acanthella simplex* Thiele, 1898.

Acanthella simplex Thiele, 1898, p. 54, Pl. 5, fig. 21, Pl. 8, fig. 38 (a–b); Tanita, 1961b, p. 138, Pl. 4, fig. 11, t-fig. 7.

Distribution: In Japan— Sagami Bay; Wagu.

131. *Acanthella vulgata* Thiele, 1898

Acanthella vulgata Thiele, 1898, p. 53, Pl. 3, fig. 8, Pl. 8, fig. 35 (a–b); Tanita, 1969, p. 52, Pl. 2, fig. 9, t-fig. 12; 1970b, p. 102, Pl. 2, fig. 10.

Distribution: In Japan— Sagami Bay; Yuki; Ariake Sea.

Genus *Prianos* Gray, 1867

132. *Prianos duoacanthostyla* n. sp.

(Fig. 85; Pl. 8, Fig. 2)

Material examined: MIT–098 (Holotype), Mitsukue, 4–XI–1973.

Dimensions: Small, thin sponge on polychaete tubes.

Habitat: Subtidal zone, about 15 m in depth, on polychaete tube.

Shape: Irregular encrusting sponge on polychaete tube, up to 2 cm thick.

Color: Peach Red 20LA or Orange 16PA.

Consistency: Soft.

Surface: Smooth, uneven or wrinkled. Oscules and pores invisible.

Ectosome: Confused, horizontal arrangement of styles, 50–80 μm in thickness,

Endosome: Irregular arrangement of styles or, rarely, acanthostyles. Occasionally tracts of styles run parallel to surface.

Spicule: Style; and Two forms of Acanthostyle.

Style— Smooth, straight, of nearly constant thickness throughout length, base rounded with other end either abruptly pointed or tapering to a point. Size range 250–283–320 × 5–6–8 μm.

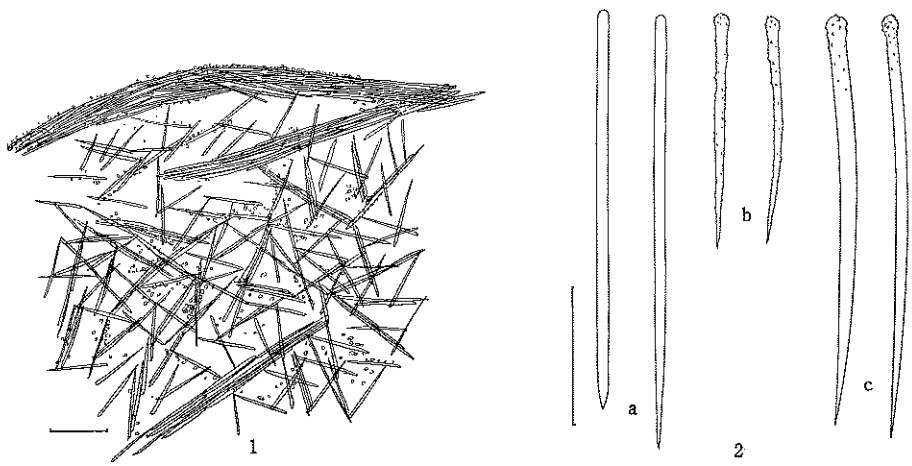


Fig. 85. *Prianos duoacanthostyla* n. sp. (MIT–098, Holotype).

1. Portion of skeleton in endosome beneath ectosome. Scale: 200 μm. 2. Spicule; Styles (a), short acanthostyles (b) and long acanthostyles (c). Scale: 100 μm.

Acanthostyle— Two forms in size and spinulation as follows: Long acanthostyle— Nearly straight or slightly bent, base slightly swollen and oddly spinulated, measuring 250–265–280×7–8–9 μm; Short Acanthostyle— Straight or nearly straight, base slightly swollen and irregularly, sharply spinulated, and sparsely spinulated throughout remaining length, measureing 138–166–180×6–7–8 μm.

Remarks: It is difficult to designate to an appropriate genus either this species or *Prianos inusitatiacanthostyla* n. sp. This species differs from *P. inuisitatiacanthostyla* in form of principal spicules and in having two forms of acanthostyles. Styles of this species, as principal spicules, do not show the typical form as seen in *Halichondria panicea*, but rather a form intermdeiate between styles and strongyles.

133. *Prianos inuisitatiacanthostyla* n. sp.

(Fig. 86; Pl. 8, Fig. 3)

Material examined: MIT–012 (Holotype), MIT–095, MIT–096, MIT–101, Mitsukue, 4–XI–1973.

Dimensions: 7×3×8 (height) cm, (MIT–012).

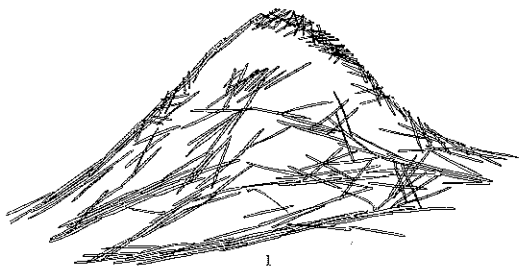
Habitat: Subtidal zone, about 15 m in depth, on rocky substrate.

Shape: Irregular massive, aggregated numerous slender and erect solid tubes. Since all tubes are straight, slightly flattened, and increase in girth with growth, the tubes appear to be united into one irregular mass in upper half of sponge.

Color: Jasper Red 22LA or Orange Red 24PA.

Consistency: Very spongy in life, but hard and fragile when dry.

Surface: Smooth, uneven. Oscules and pores invisible.



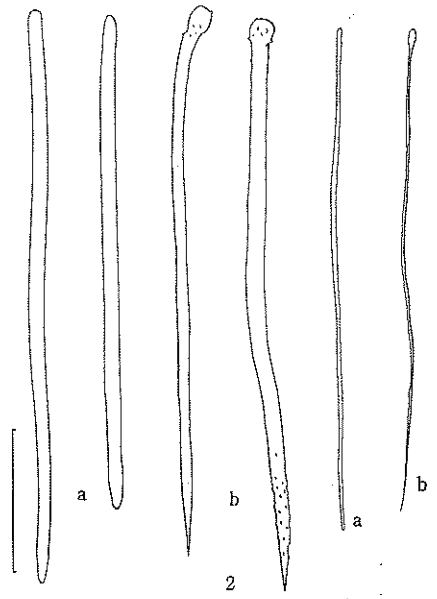


Fig. 86. *Prianos inusitatiacanthostyla* n. sp. (MIT–012, Holotype).

1. Portion of skeleton in endosome beneath ectosome. Scale: 200 μm. 2. Spicule; Strongyles (a), acanthostyles (b) and their juviniles. Scale: 100 μm.

Ectosome: Confused, horizontal arrangement of stronglyes, about 200 μm thick.

Endosome: Vague tracts containing ten to twenty rows of strongyles, 50–80 μm in diameter running parallel to surface. These vague tracts are connected in places with coarse irregular reticulation of strongyles. Occasionally a few acanthostyles exist on or near tracts.

Spicule: Strongyle; and Acanthostyle

Strongyle— Smooth, nearly straight, of nearly constant thickness throughout length or slightly tapering toward each end, with occasionally more pronounced tapering to one end. (It may be that this spicule should be regarded as strongylostyle in form.) Size range 325–396–430 × 6–9–12 μm (MIT–012).

Acanthostyle— Very rare, or not so abundant. Smooth in middle part and roughened or spined at each end. Roughened base slightly swollen and distal end tapering to a point or abruptly pointed. Varying from nearly straight to irregularly bent near base. Size range 325–404–470 × 6–9.4–12 μm (MIT–012).

Juvenile spicules are found for each spicule type, strongyle and acanthostyle.

Note:

	Dimensions of specimen	Spicule measurements	
		Strongyle	Acanthostyle
MIT–012	three fragments of one specimen	325–396–430 × 6–9–12	325–404–470 × 6–9.4–12
MIT–095	2 × 2 × 5 cm	330–399–450 × 7–8.8–10	360–402–460 × 9–11–13
MIT–096	4 × 2 × 6	360–397–424 × 7–9–10	420–441–482 × 7–12–13
MIT–101	4 × 3 × 5	325–390–420 × 8–9.6–12	320–405–443 × 9–12–16

Remarks: It is difficult to assign this species to an appropriate genus. The genus *Prianos* is diagnosed by having exclusively strongylate spiculation, but the writer assigns this species to this genus without regard to the presence of acanthostyles— although they are not so abundant or are very rare— in addition to strongyles. Further work is clearly needed to resolve this problem.

Genus *Hymeniacidon* Bowerbank, 1958

134. *Hymeniacidon adhaerens* (Thiele, 1898)

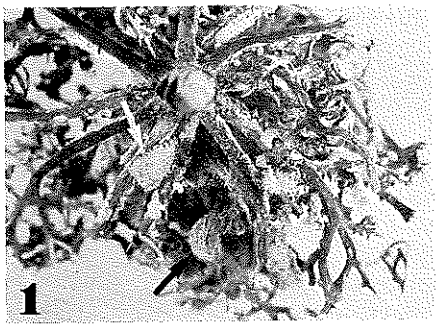
Amorphilla adhaerens Thiele, 1898, p. 46, Pl. 2, fig. 8, Pl. 8, fig. 25 (a–b).

Distribution: In Japan— Enoshima; Amami-Oshima.

PLATE I

EXPLANATION OF FIGURES

1. *Spongia hispida* Lamarck. (MIT–085), ×1.5.
2. *Spongia zimmocca* Schmidt. (MIT–002), ×1.5.
3. *Polyfibrospongia* cf. *echina* De Laubenfels. (SIS–069), ×1.4.
4. *Thorecta boleta* (Lamarck). (MIT–109), ×3.
5. *Dysidea crawshayi* De Laubenfels. (SIS–046), ×1.4.
6. *Haliclona (Haliclona) oculata* (Linne). (SIS–061), ×1.3.
7. *Haliclona (Haliclona) onomichiensis* n. sp. (SIS–055, Holotype), ×1.0.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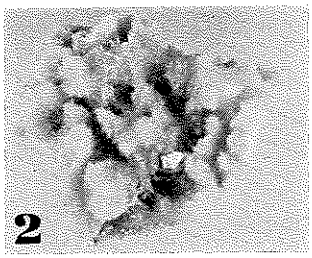
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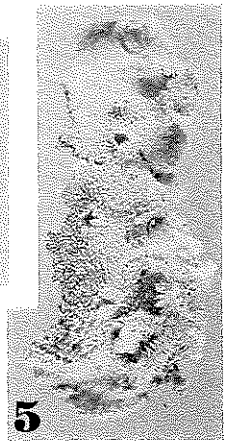
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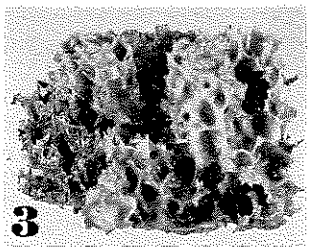
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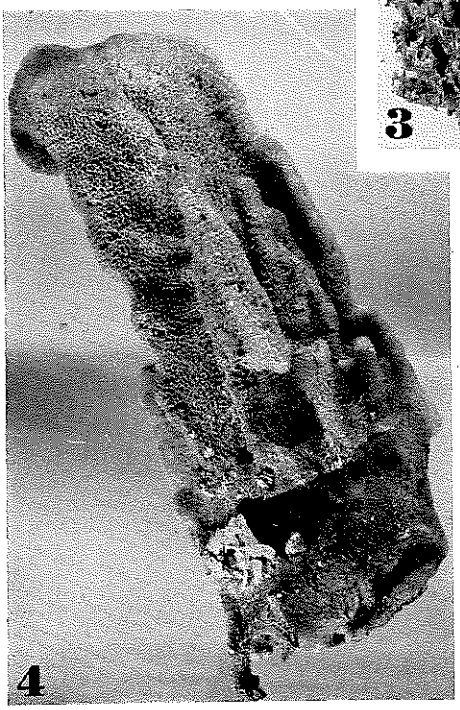
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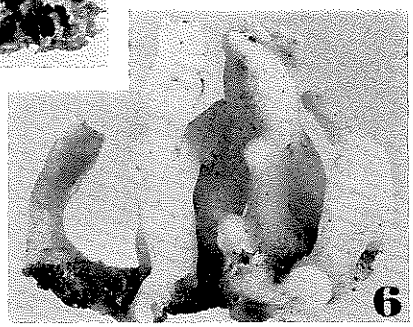
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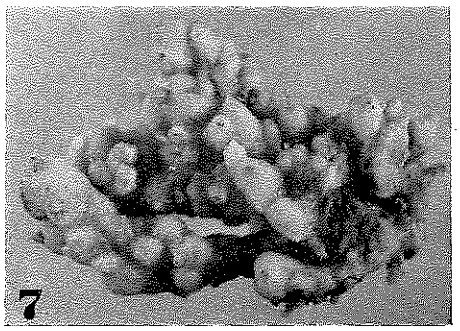
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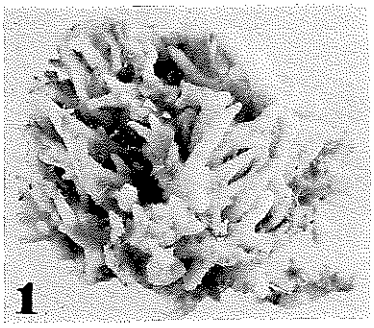
PLATE II

EXPLANATION OF FIGURES

1. *Haliclona (Haliclona) ramosamassa* n. sp. (SIS–087, Holotype), ×2.0.
2. *Haliclona (Haliclona) sasajimensis* n. sp. (SIS–035, Holotype), ×1.0.
3. *Haliclona (Haliclona) sortitio* n. sp. (MIT–074, Holotype), ×1.0.
4. *Haliclona (Haliclona) violapurpura* n. sp. (SIS–138, Holotype), ×1.4.
5. *Haliclona (Reniclona) densaspicula* n. sp. (SIS–062, Holotype), ×0.8.
6. *Haliclona (Reniclona) ellipsis* n. sp. (SIS–024, Holotype), ×0.8.
7. *Haliclona (Reniclona) lentus* n. sp. (AR–1–55, Holotype), ×1.0.
8. *Haliclona (Reniclona) offerospicula* n. sp. (SIS–090–4–b, Holotype), ×1.0.
9. *Haliclona (Reniclona) permollisimilis* n. sp. (AR–1–57, Holotype), ×0.9.
10. *Haliclona (Reniclona) punctata* n. sp. (AR–1–10, Holotype), ×0.8.
11. *Haliclona (Reniclona) robustaspicula* n. sp. (SAT–007–F, Holotype), ×1.5.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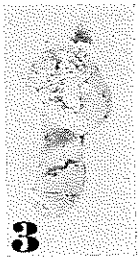
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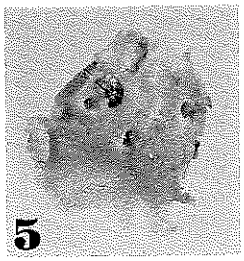
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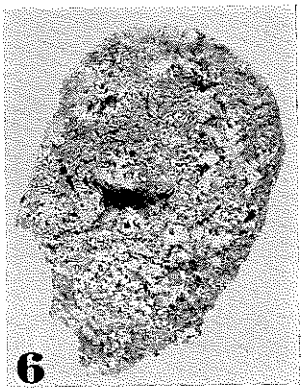
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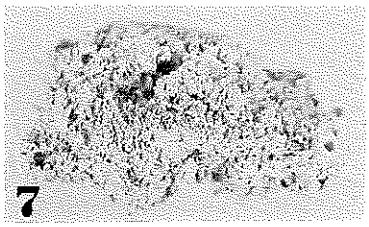
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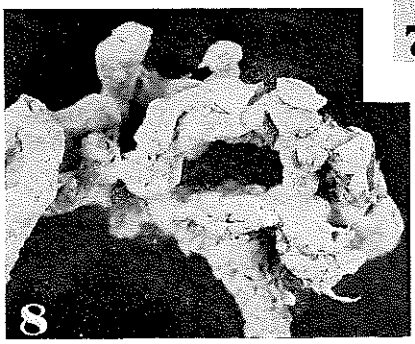
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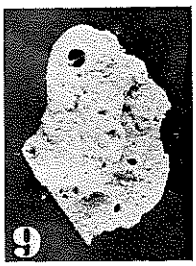
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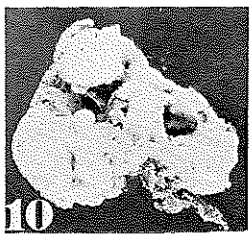
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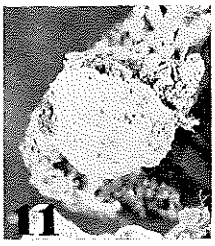
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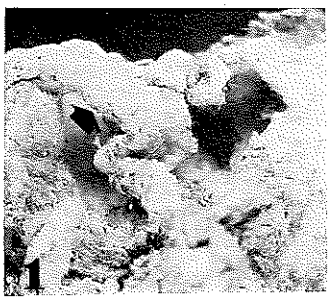
PLATE III

EXPLANATION OF FIGURES

1. *Haliclona (Reniclona) sataensis* n. sp. (MIT–028–B, Holotype), ×1 0.
2. *Haliclona (Reniclona) tachibanaensis* n. sp. (SIS–063, Holotype), ×1.5.
3. *Haliclona (Reniclona) tenuis* n. sp. (SIS–090–3–b, Holotype), ×0.8.
4. *Halijrona (Reniclona) viola* n. sp. (AR–1–38, Holotype), ×0.8.
5. *Haliclona (Reniera) enormismacula* n. sp. (SIS–003, Holotype), ×0.9.
6. *Haliclona (Reniera) frondosa* n. sp. (JAP–027, Holotype), ×1.3.
7. *Haliclona (Reniera) surrufa* n. sp. (SIS–143, Holotype), ×1.8.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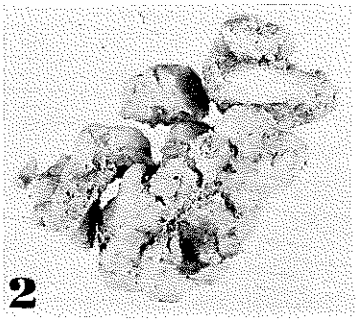
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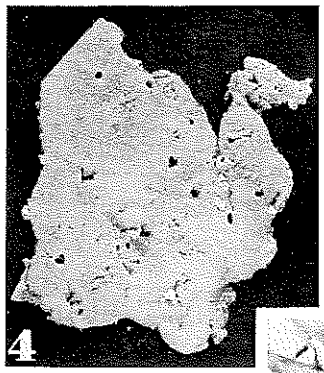
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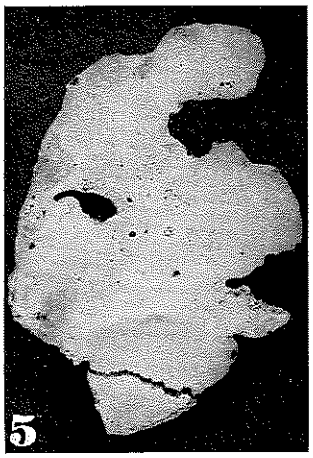
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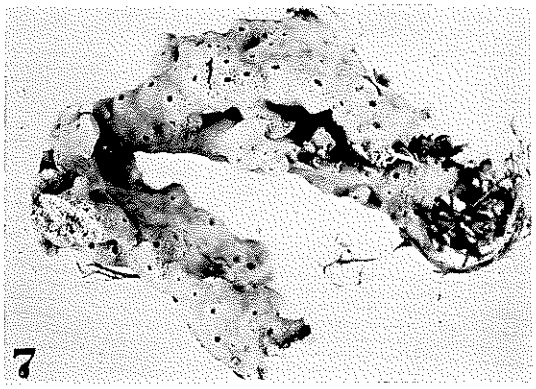
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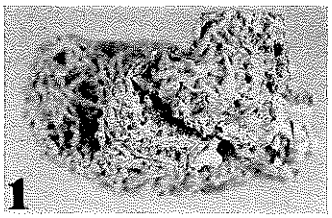
PLATE IV

EXPLANATION OF FIGURES

1. *Haliclona (Amphimedon) aitsuensis* n. sp. (AR–1–61, Holotype), ×1.0.
2. *Callyspongia ecklonia* n. sp. (MIT–032, Holotype), ×1.7.
3. *Callyspongia murex* n. sp. (AR–1–67, Holotype), ×1.0.
4. *Callyspongia patulus* n. sp. (MIT–004, Holotype), ×0.9.
5. *Callyspongia subarmigera* (Ridley). (AR–1–19), ×1.6.
6. *Ceraochalina sphaericuslobatus* n. sp. (JAP–011, Holotype), ×2.0.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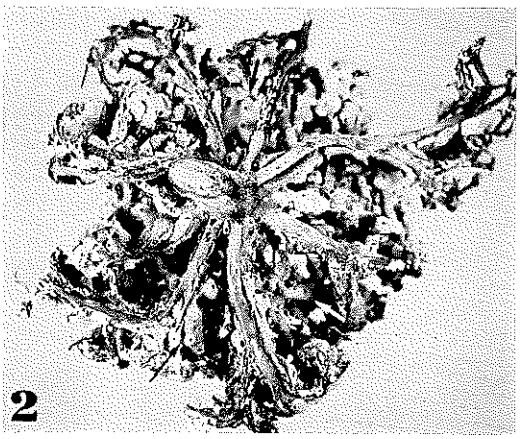
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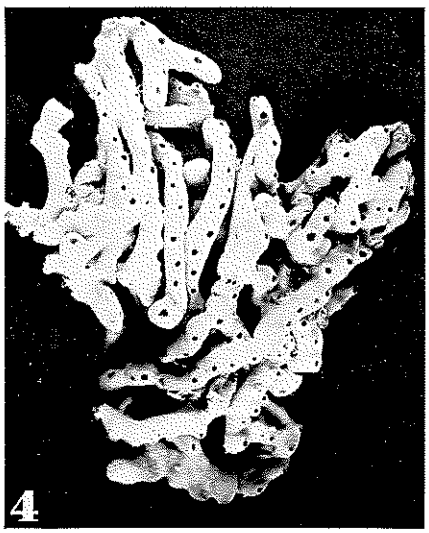
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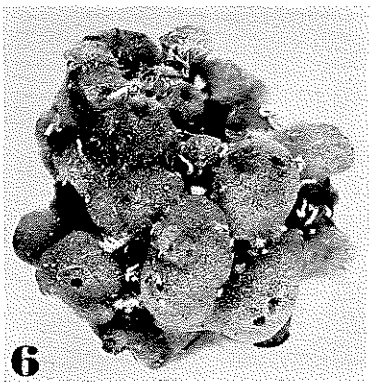
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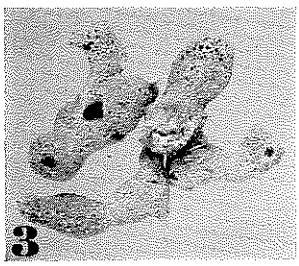
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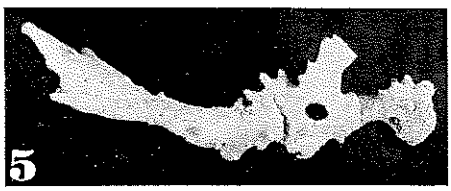
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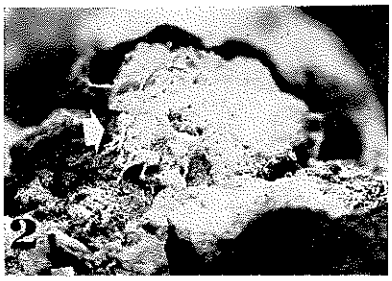
PLATE V

EXPLANATION OF FIGURES

1. *Sigmadocia liber* n. sp. (SAT–001–a, Holotype), ×1.0.
2. *Sigmadocia vagabunda* (Schmidt). (SAT–007–G), ×1.0.
3. *Toxadocia shimoebuensis* n. sp. (SIS–093, Holotype), ×1.5.
4. *Orina uwaensis* n. sp. (SAT–007–E, Holotype), ×1.0.
5. *Biminia ooita* n. sp. (JAP–030, Holotype), ×1.2.
6. *Pellina toxonisimilis* n. sp. (MIT–007, Holotype), ×1.1.
7. *Petrosia solida* n. sp. (SAT–044, Holotype), ×1.1.
8. *Petrosia solusstrongyla* n. sp. (SAT–023, Holotype), ×2.0.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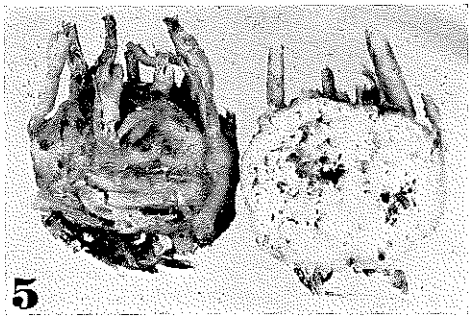
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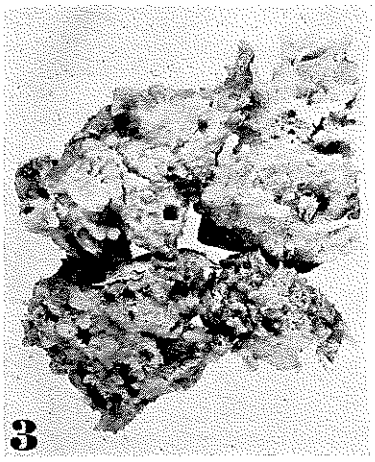
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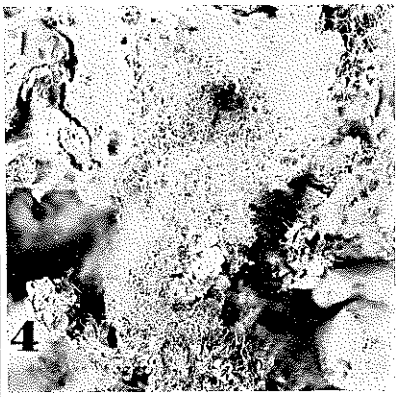
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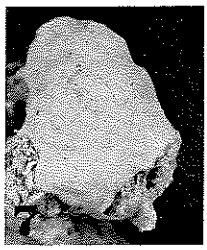
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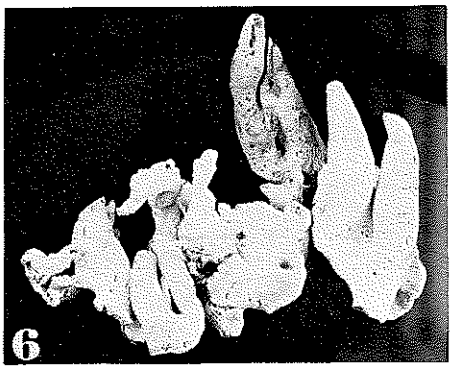
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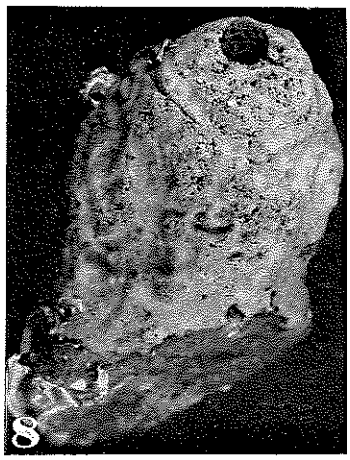
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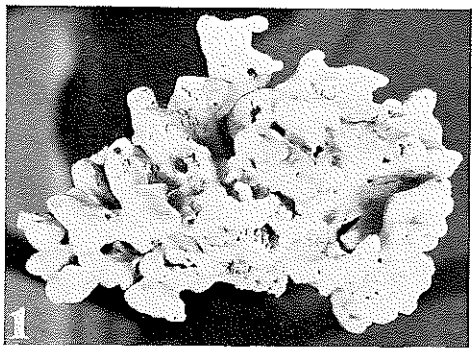
PLATE VI

EXPLANATION OF FIGURES

1. *Myxilla lobatus* n. sp. (MIT–015, Holotype), ×2.0.
2. *Myxilla productus* n. sp. (SAT–025, Holotype), ×3.0.
3. *Hymedesmia uchinourensis* n. sp. (SAT–015–B, Holotype), ×1.5.
4. *Acarnus bicladostylota* n. sp. (AR–1–10, Holotype), ×1.2.
5. *Lissodendoryx rarus* n. sp. (SAT–046–1, Holotype), ×1.1.
6. *Tedania levigotylota* n. sp. (MIT–054, Holotype), ×1.5.
7. *Tedania palola* n. sp. (SIS–101, Holotype), ×1.5.
8. *Eurypon naikaiensis* n. sp. (SIS–090–4–a, Holotype), ×1.0.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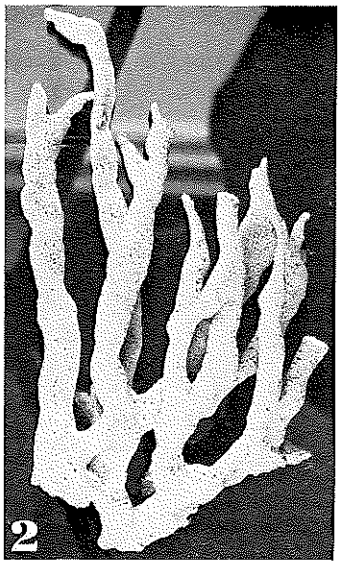
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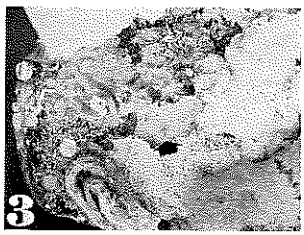
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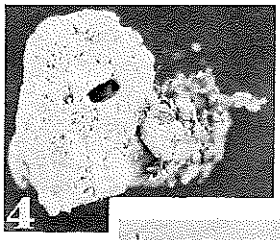
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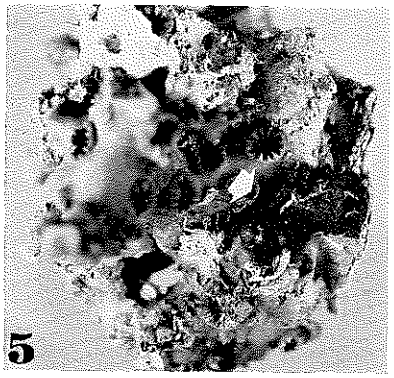
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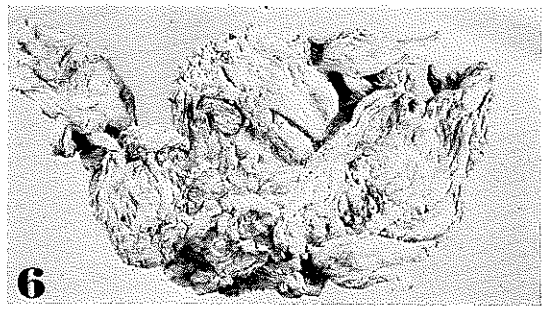
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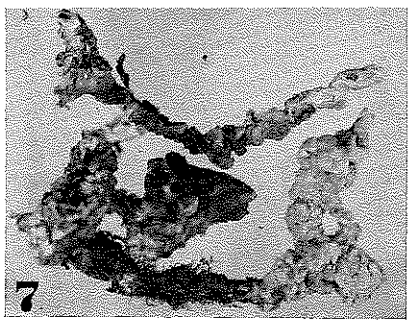
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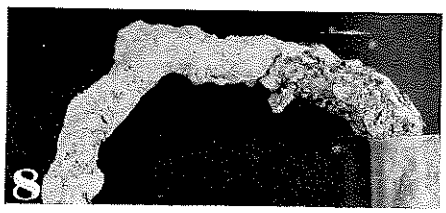
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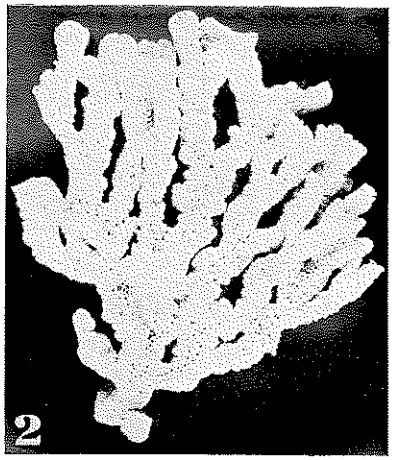
PLATE VII

EXPLANATION OF FIGURES

1. *Microciona spinatoxa* n. sp. (SIS–033, Holotype), ×1.5.
2. *Thalysias acanthostyli* n. sp. (SAT–020, Holotype), ×1.2.
3. *Thalysias productitoxa* n. sp. (SAT–018, Holotype), ×1.5.
4. *Esperiopsis variussigma* n. sp. (SAT–065–1, Holotype), ×1.5.
5. *Mycale adhaerens nullarosette* n. subsp. (SIS–071, Holotype), ×1.5.
6. *Mycale adhaerens parvasigma* n. subsp. (JAP–014, Holotype), ×2.0.
7. *Mycale lingua* (Bowerbank). (SIS–038), ×0.8.
8. *Mycale tenuisinuousitylostyli* n. sp. (SIS–031, Holotype), ×1.0.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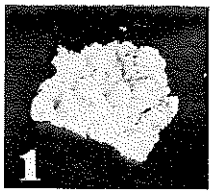
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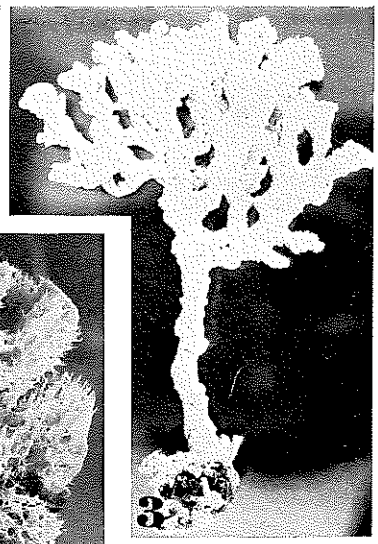
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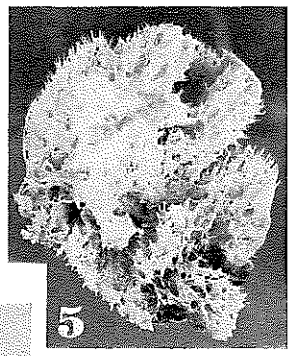
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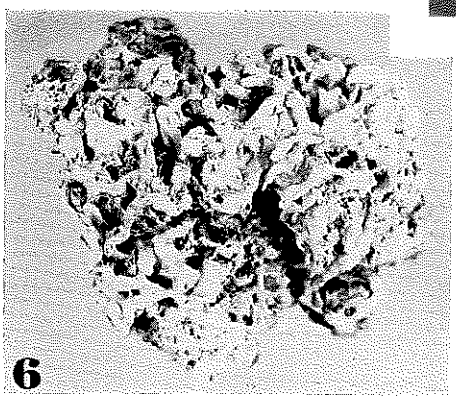
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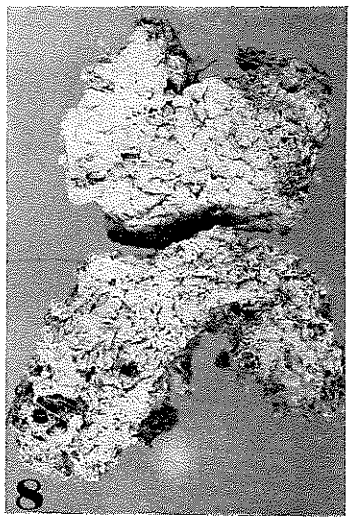
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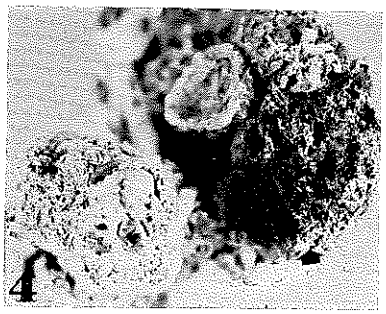
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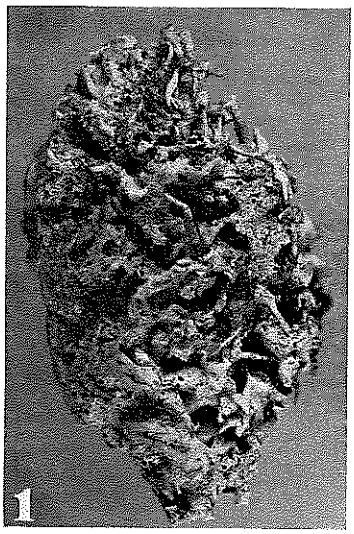
PLATE VIII

EXPLANATION OF FIGURES

1. *Halichondria surrubicunda* n. sp. (JAP–016, Holotype), ×1.5.
2. *Prianos duoacanthostyla* n. sp. (MIT–098, Holotype), ×1.6.
3. *Prianos inusitatiacanthostyla* n. sp. (MIT–012, Holotype), ×1.5.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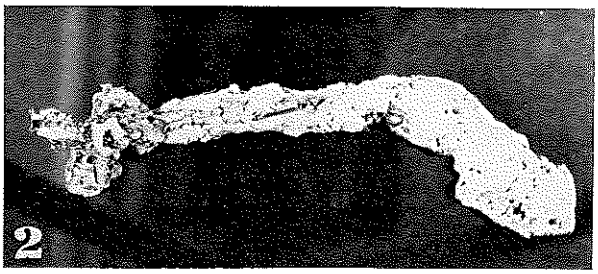
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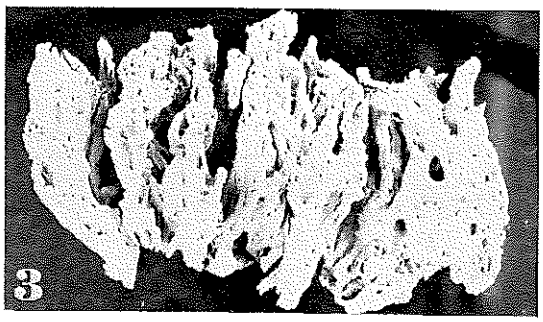
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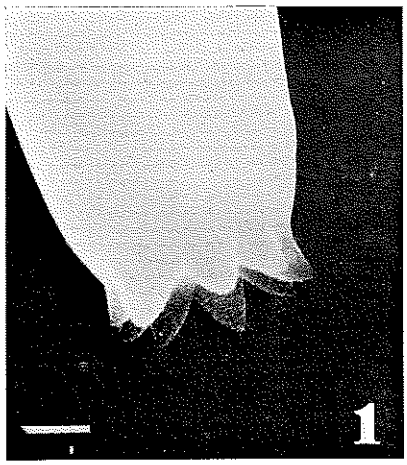
PLATE IX

EXPLANATION OF FIGURES

1–3. *Myxilla lobatus* n. sp. (MIT–015, Holotype).
  1. A tip of tornote.
  2–3. Birotulate.
4–6. *Forcepia solustylota* Hoshino. (MA–18–4, Holotype).
  4–5. Large forceps.
  6. Small forceps.

Scale bar with one spot: 10 μm. Scale bar with two spots: 100 μm.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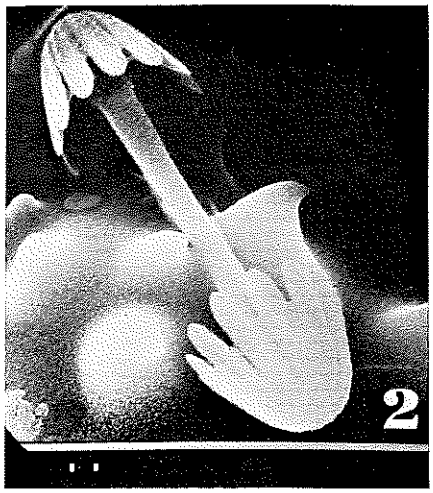
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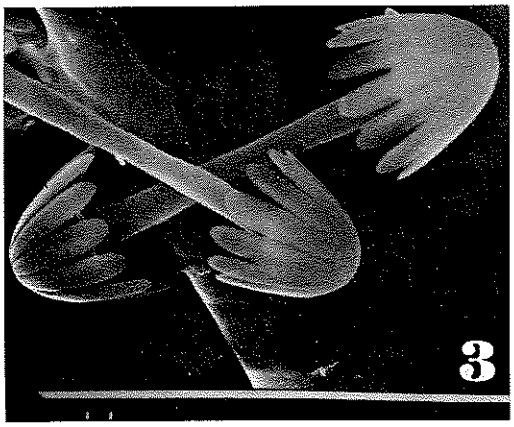
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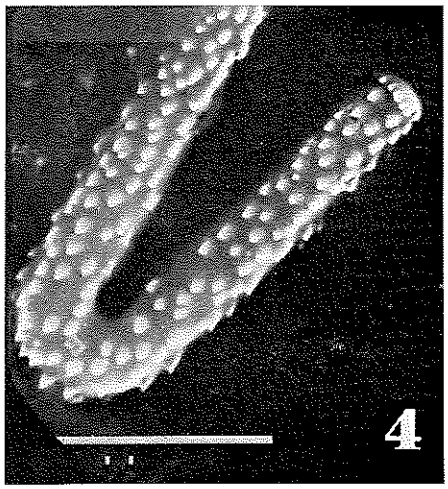
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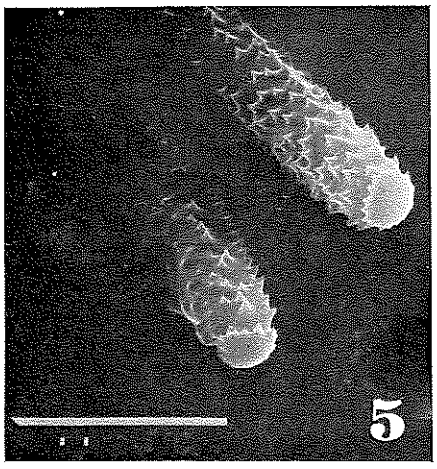
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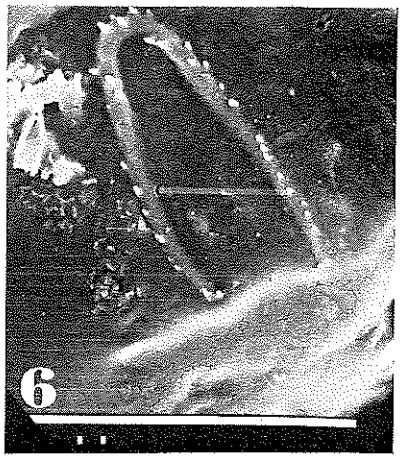
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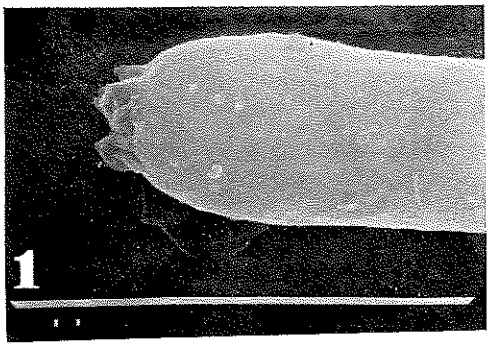
PLATE X

EXPLANATION OF FIGURES

1–4. *Tedania brevispiculata* Thiele. (AR–1–33).
  1–2. Spinules on tip of tylote.
  3–4. Surface of raphide.
5–6. *Iotrochota baculifera* Ridley. (AR–1–78).
  5–6. Birotulate.

Scale bar with one spot: 10 μm. Scale bar with two spots: 100 μm.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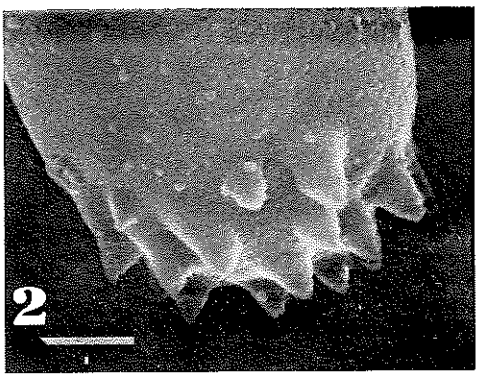
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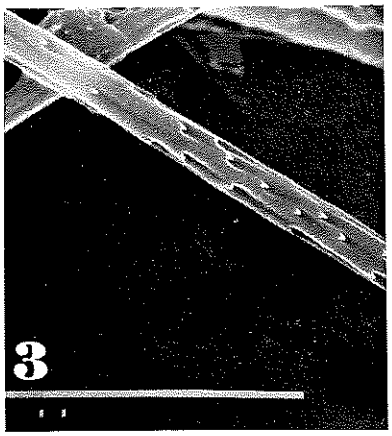
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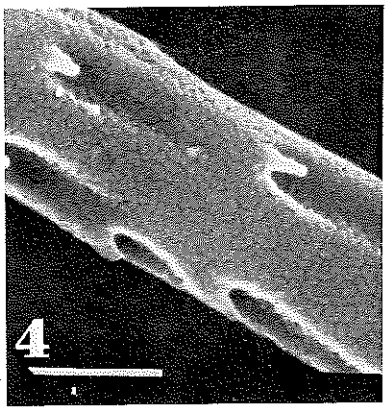
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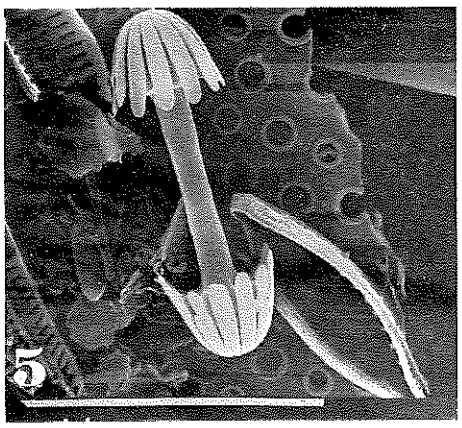
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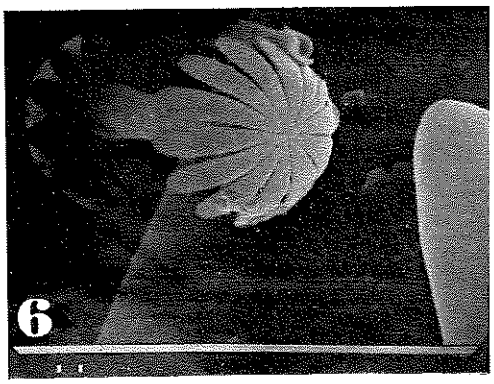
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PLATE XI

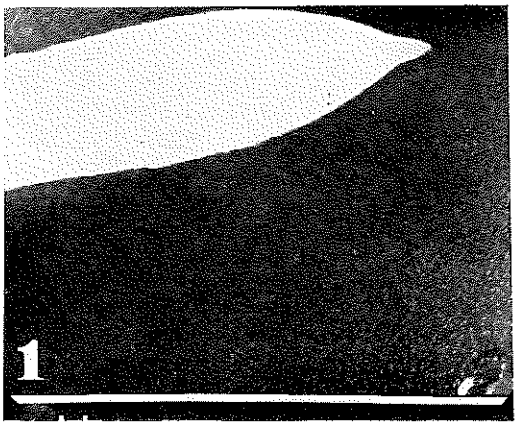
EXPLANATION OF FIGURES

1–4. *Anchinoe purpurea* Tanita. (MIT–016).

1. A tip of tornote.
2. A base of large acanthostyle.

3–4. Isochela.

Scale bar with two spots: 100 μm. Scale bar with three spots: 1000 μm.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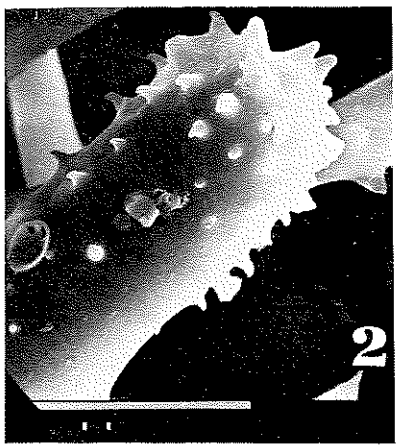
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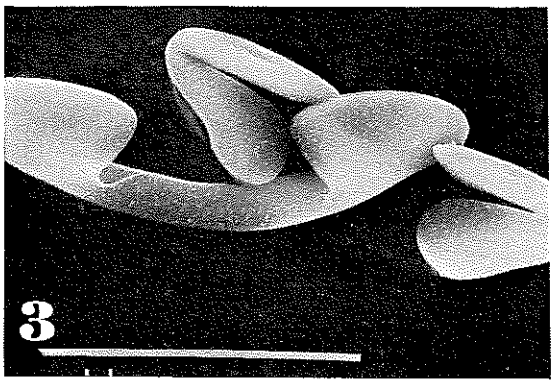
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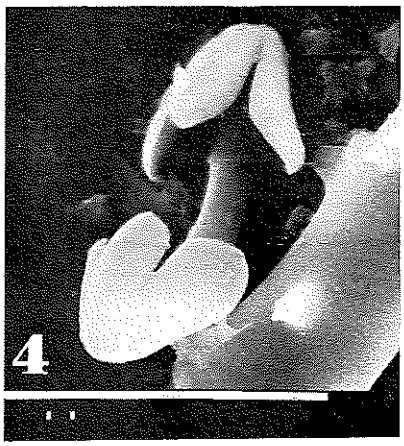
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