Report of the Biological Survey of Mutsu Bay.
12. Cheilostomatous Bryozoa of Mutsu Bay.*

By

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(With Plates I–V.)

This is the second paper on the Bryozoa of Mutsu Bay, dealing with the Cheilostomata. Twenty-seven species are recorded, six of which seem to be new to science. The observations herein given confirm the zoogeographical conclusions mentioned in the preceding paper. It is interesting to note that the Reteporan species is limited to *Retepora terebrata* BUCHNER, though this species is very abundant. This is the first time it has been observed that different kinds of substratum cause different outer configurations in *Costazia costazi* AUDOUIN, when the zooecial features are entirely similar.

Order CHEILOSTOMATA BUSK.
Suborder **ANASCA** LEVINSEN.
Division I. MALACOSTEGA LEVINSEN 1909.
Family 1. **BIFLUSTRIDAE** SMITT 1872.
Genus 1. CONOPEUM GRAY 1848.

1. Conopeum serrata (HINCKS).

(Text-fig. 1.)

Membranipora membranacea form *serrata* Hincks, 1882, A. M. N. H., vol. 10, p. 469.

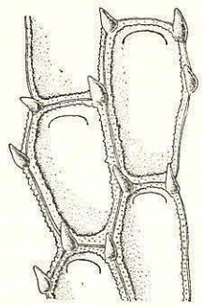
Membranipora serrata ROBERTSON, 1908, Univ. Calif. Pub. Zool., vol. 4, pp. 268–269, pl. 16, figs. 20, 21, 21 a.

Diagnosis: Zoaria consisting of circular or lobate patches incrusting seaweed. Zooecia quadrangular, oblong, alternate, arranged in lines radiating from the centre of the colony; aperture occupying the whole of the front, closed by a membranous front wall; margins

*A contribution from the Marine Biological Station, Asamushi, Aomori-Ken.

raised, with a crenated, inner rim, some of the crenations growing long and forming distinct denticles, and with a short spine at each distal angle; operculum curved, its margin strengthened by a chitinous rib. Avicularia and ooecia are wanting.

Several colonies were obtained off Ishihama (Station 43; Sp. no. 617). They were attached to Ulva and are light greyish in alcohol.



Text-fig. 1. *Conopeum serrata* (HINCKS). ×20.

Family 2. ALDERINIDAE
CANU et BASSLER 1917.

Genus 2. ELLISINA NORMAN 1903.

2. Ellisina crenulata, n. sp.
(Plate IV, fig. 1.)

Diagnosis: Zoarium incrusting, forming light greyish yellow and somewhat thick patches closely adherent to shells or stones. Zooecia alternate, arranged in lines radiating from the centre of the zoarium, somewhat large, oval or elongate. Aperture occupying the whole of the gymnocyst, closed by a membranous front wall; peristome somewhat raised, unarmed, with a calcareous, minutely crenated mural rim. Avicularia large, placed just below the lower margin of the aperture, with an elongated triangular mandible, its tip somewhat raised and directed obliquely upward. Ooecium small, transversely narrowed, quadrangular in form with a marginally thickened arched surface.

The present new species was collected at Ôma (Station 104; Sp. no. 2073), incrusting a shell of Haliotis. This is somewhat allied to *Membranipora occulata* ROBERTSON[1] but differs from it by the absence of the oral spines and scattered spatulate avicularium as well as in the ooecial features.

Family 3. BUGULIDAE GRAY 1848.

Genus 3. BUGULA OKEN 1815.

[1] ROBERTSON, 1908, Univ. Calif. Pub. Zool., Vol, 4, pp. 262–263, pl. 14, figs. 6–8.

3. Bugula neritina (LINNAEUS).
(Plate I, fig. 1.)

Sertularia neritina LINNAEUS, 1758, Syst. Nat., ed. x, 38.

Bugula neritina OKEN, 1815, Lehl. der Nat., Abt. 2. — HELLER, 1867, Ad. Bry., p. 90. — MCCOY, 1881, Prod. Zool. Vict., decade vi, p. 41, pl. LIX, fig. 7. — BUSK, 1884, Chall. Rept., vol. x, pt. xxx, p. 42. — WATERS, 1887, A. M. N. H., 5, xx, p. 91, pl. iv, figs. 3, 15 — CARNUS, 1889, Prod. Faun. Medit., vol. ii, p. 6. — ORTMANN, 1890, Arch. für Naturg. Berlin, LVI, p. 24, pl. i, fig. 17. — PHILLIPS, 1899, Willey's Zool. Res., iv, p. 440. — ROBERTSON, 1905. Univ. Calif. Pub. Zool., vol. ii, p. 266, pl. ix, fig. 47, pl. xvi, fig. 97. — CALVET, 1906, Bull. Mus. Paris, p. 12. — THORNELY, 1907, Rec. Ind. Mus., vol. i. p. 183. — OKADA, 1918, Annot. Zool. Jap., vol. ix, pt. iv, p. 484.

Acamarchis neritina LAMOUROUX, 1816, Hist. Poly. Coral, p. 58, pl. iii, fig. 2.

Cellularia neritina JOHNSTON, 1847, Brit. Z., p. 340, pl. ix, figs. 3, 4.

Diagnosis: Zoarium consisting of bushy tufts, dark brown or reddish brown, often tinged with purple. Branching dichotomous. Zooecia biserial, quadrangular, truncate above; aperture occupying more than two-thirds of the gymnocyst; a short denticle at the summit of the sides of the zooecium. Ooecia conspicuous, globose, attached to the inner anterior angle of the zooecium by a short peduncle. Avicularia wanting. Rootlets forming a tuft at the base of the colony.

Several small colonies which may be identified with the above species exist in the collection. They were obtained at Yunoshima (Station 1; Sp. no. 460). Compared with specimens from the southern part of Japan, the zoarium of this form is much more delicate and smaller, having much slenderer branches. This is widely distributed throughout the world, and in Japan was first recorded by ORTMANN from Sagami Sea, and later by me from the southern part of Japan. This specimen likewise possesses no avicularia, as is the case with all Japanese specimens, so far as have come under my observation.

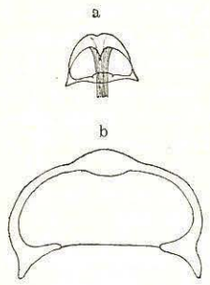
Family 4. SCRUPOCELLARIIDAE LEVINSEN 1909.

Genus 4. CABEREA LAMOUROUX 1816.

4. Caberea hataii, n. sp.
(Plate I, fig. 2; Plate IV, fig. 2; Text-fig. 2.)

Diagnosis: Zoarium an irregular flabellate tuft, attached to the substratum by numerous rootlets, 30 mm. heigh. Branches somewhat

broad, dichotomously dividing at rather wide intervals. Zooecia arranged in transverse rows of four or six, somewhat elongate, nearly uniformly wide throughout the length, apertures with a spine on each side close to the anterior margin. The scutum, short and rod-like in shape, exists on the middle of either side of the peristome. Lateral avicularia present on the outer margin of the outermost lateral zooecia, with a triangular mandible, pointed at the end. Frontal avicularia small, usually existing on both sides of the lower margin of the zooecial aperture, with a semicircular mandible, with a pointed and recurved end. Vibraculum and its chamber exhibit nearly the same features as that of *Caberea lata* B. Ooecia: somewhat small, weakly inflated, nearly semicircular, with a thick arched margin. Root-fibres occur in the same manner as in *Caberea lata* B.



Text-fig. 2. *Caberea hataii* n. sp.
a. Mandible of frontal avicularium ×200.
b. Operculum ×200.

This new species is represented in the collection by several large and small colonies which were obtained at the following localities: Off Nakanosawa (Station 80; Sp. no. 459); off Ishihama (Station 43; Sp. no. 472); off Tsubakiyama (Sp. no. 1677, 1672). They were attached to worm-tubes and stones. The present species closely resembles *Caberea lata* B.[1] and *Caberea climacina* ORTMANN[2], but differs from the former by the presence of a rod-like scutum on the margin of the peristome and from the latter by the presence of lateral avicularia and of the oral spines.

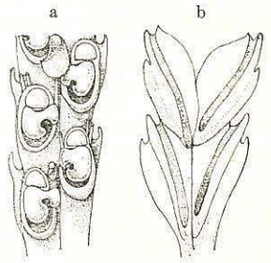
5. **Caberea tenella**, n. sp.
(Text-fig. 3.)

Diagnosis: Zoarium small, dichotomously branched; branches slender, delicate, nearly the same breadth throughout. Zooecia biserially arranged, short, subquadrangular; apertures elliptical, occupying about half the gymnocyst of the zooecium with a narrow smooth margin,

[1] BUSK, 1852, Cat. Mar. Poly. Brit. Mus., 1, p. 39, pl. 47.
[2] ORTMANN, 1890, Arch. für Naturg. Berlin, Bd. 1, p. 22, pl. 1, fig. 6.

sloping outwards, and with one or two spines above on the outer side. Scutum large, elliptical, covering the aperture. Lateral avicularia wanting. Frontal avicularia in two forms; the larger one exists unfrequently on some zooecia with triangular, curved mandible, prominently raised, the small one more frequently appears on zooecia, placed on a lateral side of zooecial aperture, raised with a semicircular mandible, directed downwards. Vibraculum long, serrate. Ooecia unknown.

A small colony of this new species exists in the collection. It was collected at Ôma (Station 104; Sp. no. 2140), attached to a stone.



Text-fig. 3. *Caberea tenella* n. sp.
a. Ventral view of zooecia ×65.
b. Dorsal view of vibracula ×65.

Genus 5. MENIPEA LAMOUROUX 1816.

6. **Menipea occidentalis** var. **catalinensis** ROBERTSON.
(Plate I, fig. 3.)

Menipea occidentalis var. *catalinensis* ROBERTSON, 1905, Pub. Univ. Calif. Zool., vol. 2, no. 5, pp. 255–256, pl. vii, figs. 26–27. — OKADA, 1918, Annot. Zool. Jap., vol. ix, part. iv, pp. 409–410.

Diagnosis: Zoarium forming a bushy tuft, attached by a large number of root fibres. Branching regular, each tuft or frond consisting of a main rib from which secondary branches arise alternately, these again giving off tertiary branches. Internodes consisting of four or five zooecia. Zooecia elongated, narrowed below; aperture occupying about half the gymnocyst, surrounded by six jointed spines, sometimes by five or seven. Scutum fan-shaped, the edge being divided and extended into five or more spinous processes, making it so large as to cover the lower half of the aperture. Ooecia large, globose, just above the gymnocyst, perforated by a small number of pores. Root-fibres arising in root-chambers just above the lateral avicularia; the root-chambers situated on the lower zooecia only, rounded, projecting dorsally and laterally.

Several colonies which may be identified with the above species,

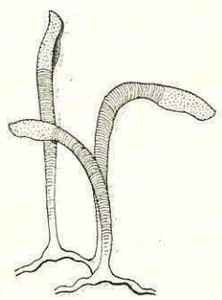
exist in the collection. They were obtained at near the Biological Station (Station 4; Sp. no. 425); at Ôma (Station 104; Sp. no. ?), off the Tuchiya coast (Sp. no. 1884); in front of the Biological Station (Sp. no. 1876), attached to sea-weeds.

According to ROBERTSON's description of the present form *Menipea occidentalis* var. *catalinensis* is characteristic in having a divided scutum and in the number of zooecia in an internode. But from the observation of the specimens before me, the characters above mentioned do not constantly appear, though they are variable in shape, being frequently divided, and occasionally undivided in the zooecia of an internode.

Family 4. **AETEIDAE** SMITT 1867.
Genus 6. AETEA LAMOUROUX 1812.

7. Aetea anguina (LINNAEUS).
(Text-fig. 4.)

Sertularia anguina LINNAEUS, 1758, Syst. Nat., Ed. x, vol. 1.
Cellaria anguina ELLIS et SOLANDER, 1786, Nat. Hist. Zooph., p. 26.
Aetea anguina LAMOUROUX, 1812, Bull. Sc. Soc. Phil., p. 184. — BUSK, 1852, Cat. Mar. Poly. Brit. Mus., p. 31, pl. xv, fig. 1. — HINCKS, 1880, Brit. Mar. Poly., p. 4, pl. 1, figs. 4, 5. — BUSK, 1884, Chall. Rep., p. 2. — OSBURN, 1912, Bull. Bur. Fish., p. 220, pl. xxi, fig. 14, 14 a. — WATERS, 1913, Proc. Zool. Soc. London, p. 463, pl. LXIV, fig. 1, 2. — HARMER, 1926, Poly. Sib. Exp., xxviii b, pp. 194–195, pl. xiii. figs. 3, 4.



Text-fig. 4. *Aetea anguinea* (LINNAEUS) ×23.

Diagnosis: Zoarium encrusting, slender filamentous. Zooecia with a long attached portion, at first delicate and of uniform diameter, then gradually dilating and passing at a right angle into the free distal peristome, which is straight and then curved. Frontal membrane on the side facing the adherent part, expanding at its middle, the operculum terminal. Peristome at first with numerous punctations.

A large colony which may be identified with the present species exists in the collection. It was obtained at Ôma (Station 104; Sp. no. 2144) and attached to sea-weed. The Japanese species was previously described by HARMER from the specimen collected at a spot off Tokyo Bay collected by A. OWSTON in 1902.

Suborder **ASCOPHORA** LAMOUROUX 1909.
Family 5. **HIPPOTHOIDAE** LEVINSEN 1909.
Genus 7. HIPPOTHOA LAMOUROUX 1821.

8. Hippothoa hyalina (LINNAEUS).
(Plate I, fig. 4; Plate IV, fig. 3.)

Cellepora hyalina LINNAEUS, 1766–1768, Syst. Nat. ed. 2, p. 1286.
Berenicea hyalina HASSALL, 1840, A. M. N. H., vii, p. 367.
Lepralia hyalina W. THOMPSON, 1840, A. M. N. H., v, p. 253. — JOHNSTON, 1842, Brit. Z., ed. 2, p. 301, pl. LIV. fig. 1. — BUSK, 1854, Cat. Mar. Poly. Brit. Mus., ii, p. 84, pl. lxxxii, figs. 1–3, pl. xcv, figs. 3–5, pl. ci. figs. 1, 2.
Mollia hyalina SMITT, 1867, Oefv. K. Vetenek. Ak. Förh., iv, 16, p. 109, pl. xxv, figs. 84, 85.
Schizoporella hyalina HINCKS, 1880, Hist. Brit. Mar. Poly., pp. 271–275, pl. xviii, figs. 8–10. — WATERS, Journ. Linn. Soc. London, v, 34, p. 20. — ROBERTSON, 1900, Proc. Wash. Acad. Sc., vol. ii, p. 326. — WHITEAVES, 1901, Geol. Surv. of Canada, p. 100. — CORNISH, 1907, Mar. Fish. Rep. Canada, no. 22, p. 77. — ROBERTSON, 1908, Univ. Calif. Pub. Zool., pp. 289–290, figs. 43–45.
Hippothoa hyalina OSBURN, 1912, Bull. Bur. Fish., xxx, pp. 235–236, pl. xxiv, figs. 47, 47 a–47 c. — MARCUS, 1914–16, Bry. von den Auckland und Campbell Inseln, pp. 97–98, pl. v, fig. 3. — NORDGAARD, 1918, Bry. from the Arct. Reg., p. 52. — MARCUS, 1920, Nat. Hist. Juan Fern. & East. Isl., vol. iii, pp. 102–103, fig. 5. — MARCUS, 1921, Arkiv. für Zoologi. K. Svenska Vet., Bd. 14, no. 7, p. 12.
Cellepora hyalina NORDGARD, 1900, Den Nors. Nordh. Exp., xxvii, p. 10.

Diagnosis: Zoarium a delicate, foliaceous, irregular mass consisting of the zooecia piled on top of each other, in an irregular way. Zooecia variously shaped elongate-ovate or subcylindrical, distinct, disposed somewhat irregularly in radiating rows and separated by large punctures; gymnocysts thin, delicate, hyaline, smooth and shining, or slightly followed transversely and sometimes with a distinct broad umbo just below the aperture. Zooecial aperture terminal, orbicular, with a deep rimule at the middle of the lower margin. Ooecia large, globose, prominent, punctured sparsely, sometimes with an umbo in the middle of the ooecial wall. Avicularia wanting.

Numerous colonies which may be referable to the above species exist in the collection. They were obtained from the following various localities: at Futagojima (Station 26; Sp. no. 430, 612); off Itanozaki (Station 31; Sp. no. 434, 445); off Ishihama (Station 43; Sp. no. 615); off Shimizugawa (Station 73; Sp. no. 627); off Yokohama (Station 81; Sp. no. 431). They were attached to individuals of sea-weed or Hydrozoa.

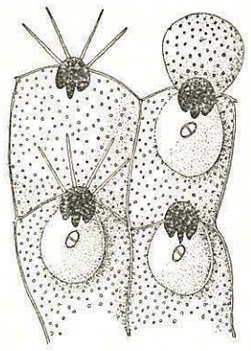
Family 6. ESCHARELLIDAE Levinsen 1909.
Subfamily a. SCHIZOPORELLAE Canu et Bassler 1917.
Genus 9. SCHIZOMAVELLA Canu et Bassler 1917.

9. Schizomavella auriculata (Hassall).
(Text-fig. 5.)

Lepralia auriculata Hassall, 1842, A. M. N. H., vii, 412. — Johnston, 1847, Brit. Z. ed. 2, 310, pl. liv. fig. 8. — Busk, 1854, Cat. Mar. Poly. Brit. Mus., ii, 67, pl. lxxxix, figs. 4–6.

Escharella auriculata Smitt, 1867, Oefv. K. Vetensk- Ak. Förh., iv, 12 & 90, pl. xxiv. figs. 58, 59.

Schizoporella auriculata Hincks, 1880, Hist. Brit. Mar. Poly., 260-263, pl. xxix, figs. 3–9. — Robertson, 1908, Univ. Calif. Pub. Zool., vol. 4, 286, pl. 19, fig. 39. — Okada, 1923, Annot. Zool. Jap., vol. 10, Art. 22, p. 230.



Text-fig. 5. *Schizomavella auriculata* (Hassall). ×140.

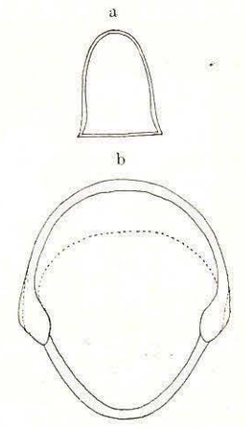
Diagnosis: Zoarium incrusting, spreading in subcircular patches. Zooecia rhomboid, sometimes subovate, short, disposed in linear series, radiating from a central point, separated by raised lines, punctured or granular; aperture small, suborbicular, with a rimule below and with 2–4 marginal spines. A small frontal avicularium with a rounded mandible, immediately below the middle of the lower margin, usually on a mamillary eminence which is sometimes prolonged into a mucro. Ooecia subglobose, depressed, closely united to the zooecium above, sometimes completely immersed, punctured, often partially enveloped in a glandular crust; occasionally mucronate.

A small colony was obtained at Ôma (Station 104; Sp. no. 2143). It was attached to a stone and is milky white in alcohol.

10. Schizomavella galeata (Busk).
(Plate I, fig. 5; Plate IV, fig. 4; Text-fig. 6.)

Lepralia galeata Busk, 1854, Cat. Mar. Poly. Brit. Mus., pt. ii, p. 66, pl. xciv, figs. 1, 2.

Diagnosis: Zoarium incrusting. Zooecia ovato-ventricose, disposed in linear series, separated by raised lines; gymnocyst punctured all over. Zooecial aperture orbicular, weakly contracted below by two cardelles, the lower margin slightly curved outwards, unarmed. Frontal avicularia immediately below the zooecial aperture, with semicircular mandible. Ooecia globose, inflated distinctly, covered with punctures of different sizes.



Text-fig. 6. *Schizomavella galeata* (Busk).
a. Mandible of frontal avicularium ×200.
b. Operculum ×200.

This species is represented in the collection by a few colonies and fragments. They were obtained from the following localities: Off Yunoshima (Station 6; Sp. no. 608); near Mourakojima (Station 24; Sp. no. 454); at Futagojima (Station 26; Sp. no. 623); off Yadonobe (Station 63; Sp. no. ?); off Karibazawa (Station 74; Sp. no. 613); off Akemae (Station 76; Sp. no. 611). They were attached to Hydrozoa, a plate of *Cirriped* and to a *Retepora terebrata* Buch., and infrequently exhibit a thick lamella-like zoarium the base of which is attached to a substratum. The zoarium in alcohol is yellowish brown. Operculum oblong with thickened outer margin. The mandible of the avicularia shows a somewhat obtusely triangular shape, with a narrow thickened margin. The oral avicularia are not found on the marginal zooecia of a colony.

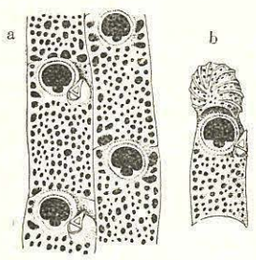
Genus 10. SCHIZOPODRELLA CANU et BASSLER 1917.

11. Schizopodrella unicornis (JOHNSTON).

(Text-fig. 7)

Lepralia unicornis JOHNSTON, 1847, Brit. Z., p. 320, pl. LVII, fig. 1. — BUSK, 1856, Quart. Journ. Mic. Sc., iv, p. 309, pl. x, fig. 3, 4. — BUSK, 1859, Crag Poly., p. 45, pl. v, fig. 4.

Schizoporella unicornis HINCKS, 1880, Hist. Brit. Mar. Poly., p. 238, pl. 35, fig. 1–5. — NORDGAARD, 1905, Hyd. Biol. Inv. Norw. Fjords, p. 165, pl. 5, figs. 23–25, 27. — CALVET, 1907, Exped. Sc. Trav. Talisman, vol. viii, p. 417. — NORMAN, 1909, Journ. Linn. Soc. London, vol. xxx, p. 417. — WATERS, 1909, Journ. Linn. Soc., Zool., vol. xxxi, p. 143, pl. xii, figs. 12, 13. — OSBURN, 1912, Bull. Bur. of Fish., 236, pl. xxv, fig. 48–48 e, pl. xxx, fig. 91. — WATERS, 1913, Proc. Zool. Soc. London, p. 501–502. — NORDGAARD, 1917, Bry. from the Arct. Reg., 56. — WATERS, 1918, Journ. Linn. Soc. London, pp. 14–15, pl. 2, fig. 14–17, 22.



Text-fig. 7. *Schizopodrella unicornis.* (JOHNSTON).
a. Ventral view of zooecia ×20.
b. Zooecium with an ooecium ×20.

Diagnosis: Zoarium forming a greyish incrustation. Zooecia elongated squarish, bordered with a thick margin; which have no apparent order of arrangement, disposed in linear series. Zooecial aperture subcircular, arched above, slightly contracted in the middle, with two cardelles on each, the lower border with a rather large rounded rimule, peristome somewhat thick and elevated. Avicularia wanting. Ooecia subglobose, inflated above, punctured irregularly with large and small pores.

Several small and large colonies were obtained off Yunoshima Station 6; (Sp. no. 478) and off Akemae (Station 76; Sp. no. 482 a). They were attached to stones and shells of Cirripedia.

Genus 11. SCHIZOPORELLA HINCKS 1877.

12. Schizoporella crustacea (SMITT).

(Plate I, fig. 6; Plate IV, fig. 5.)

Myriozoum crustaceum SMITT, 1867, Oefv. K. Vetensk. Akad. Förh., p. 18, pl. xxv, figs. 88–91. — RIDLEY, 1881, A. M. N. H., 5, vii, p. 448. — BIDENKAP, 1898, Zool. Jahrb., vol. x, p. 622.

Schizoporella crustacea LORENZ, 1886, Bry. von Jan. Mayen, p. 87, pl. vii, fig. 2. — WATERS, 1900, Journ. Linn. Soc., xxviii, pp. 64–65, pl. 8, figs. 11–13.

Diagnosis: Zoarium incrusting. Zooecia somewhat small, irregular in shape, very indistinctly bordered with marginal lines, disposed quinquncially. Zooecial aperture semicircular, with a small, somewhat deep rimule on the centre of the straight lower margin. The surface of gymnocyst perforated with small, variously sized pores in an irregular manner. Frontal avicularia frequently occur, oval, with a semicircular mandible, situated on either side of the zooecial aperture.

Numerous colonies were attached to stones. They were obtained at Ôma (Station 104; Sp. no. 2134) and are light blue or brownish white in alcohol.

Subfamily b. HIPPOPORAE CANU et BASSLER 1917.

Genus 12. HIPPOPONELLA CANU et BASSLER 1920.

13. Hippoponella hippopus (SMITT).

(Plate IV, fig. 6; Text-fig. 8.)

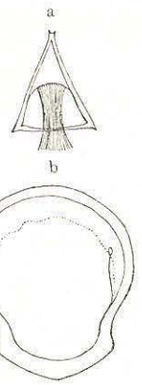
Lepralia hippopus SMITT, 1867, Oefv. K. Vetensk. Ak. Förh., p. 20, tab. xxvi, figs. 99–105.

Lepralia adpressa BUSK, 1852, Cat. Mar. Poly. Brit. Mus., pt. ii, p. 82, tab. cii, figs. 3, 4. — BUSK, 1856, Quart. Journ. Mic. Sc., vol. iv, p. 178. — HINCKS, 1861, A. M. N. H., ser. 3, vol. ix, p. 205.

Hippoponella hippopus BASSLER et CANU, 1920, Bull. 106, Unit. Stat. Nat. Mus., p. 379.

Diagnosis: Zoarium incrusting. Zooecia somewhat oval, quincuncial; gymnocyst nodulous, with areolae along the outer margin, infrequently a weakly raised umbo, just below the zooecial aperture; zooecial aperture semicircular above, contracted on each side below the middle and margined with a weakly thickened surface. Avicularia occasionally occur on one side of the aperture with a triangular mandible. Ooecia immersed, small globose, with a longitudinal short rod-like opening in the middle of the lower margin.

A somewhat large colony which may be referable to the above species exists in the collection. It was collected near off Itanozaki



Text-fig. 8. *Hippoponella hippopus* (SMITT).
a. Mandible of frontal avicularium ×200.
b. Operculum ×200.

(Station 31; Sp. no. 423) and was attached to the plate of a Cirriped.

Genus 13. LEPRALIA JOHNSTON 1847.

14. Lepralia foliacea (ELLIS et SOLANDER).

(Plate II, Fig. 1; Plate IV, fig. 7.)

Millepora foliacea ELLIS & SOL., 1786, Nat. Hist. Zooph., 133.

Eschara foliacea LAMK., 1836, An. s. Vert. ed. 2, ii, p. 266. — MILNE-EDW., 1844, Ann. d. Sc. Nat., vi, p. 36, pl. iii, fig. 1. — COUCH, 1844, Corn. Faun. pt. iii, p. 131. — JOHNSTON, 1847, Brit. Z., ed. 2, p. 350, pl. lxvii. — BUSK, 1852, Cat. Mar. Poly. Brit. Mus., ii. p. 89, pl. cvi, figs. 4–7. — HELLER, 1867, Bryoz. d. adriat. Meer., p. 38. — MANZONI, 1870, Bryoz. foss. Ital., contr. iv, p. 18, pl. i, fig. 4 & pl. iv, fig. 24.

Lepralia foliacea HINCKS, 1880, Hist. Brit. Mar. Poly., pp. 300–302, pl. xlvii, figs. 1–4.

Diagnosis: Zoarium foliaceous, membrano-calcareous. Zooecia disposed in two layers placed back to back, or occasionally in one layer, ovate-elongate, or rhomboid, quincuncially arranged, separated by distinct lines, very moderately convex; surface punctured and often nodulous, the punctures frequently surrounded by thick reticulated ridges sometimes areolated round the margin; aperture arched above, weakly contracted a little below the middle, where there is a small cardelle on each side, the lower margin almost straight, or very slightly elevated in the centre. A prominent central avicularium just immediately below the lower apertural margin has a rounded mandible pointing downwards, sometimes replaced by a spatulate avicularium. Ooecia large, often subimmersed, a little flattened in front, smooth and shining.

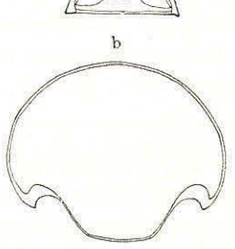
Several small colonies which may be identified with the above species exist in the collection. They were attached to seaweed and were obtained off Yunoshima (Station 6; Sp. no. 645) and off Futagojima (Station 26; Sp. no. unknown).

15. Lepralia pertusa (ESPER).

(Plate II, fig. 2; Plate IV, fig. 8; Text-fig. 9.)

Cellepora pertusa ESPER, 1791, Pflanz. Cellep., p. 149, pl. x, fig. 2.
Escharina pertusa MILNE-EDWARDS, 1844, Lamk. An. s. Vert., ed. 2, ii. p. 232.
Cellepora perlacea W. THOMPSON, 1843, A. M. N. H., x. p. 20.
Lepralia pertusa JOHNSTON, 1847, Brit. Z., ed. 2, p. 311, pl. liv. fig. 10. — BUSK, 1852, Cat. Mar. Poly. Brit. Mus., ii, p. 80, pl. lxxviii, fig. 3, pl. lxxix, figs. 1, 2. — HELLER, 1867, Bryoz. d. Adr. Meeres, p. 35.
Escharella pertusa SMITT, 1872, Flor. Bryoz., pt. ii, p. 55.

Diagnosis: Zoarium incrusting. Zooecia large, regularly ovate, distinct, separated by raised lines; gymnocyst covered with punctures; zooecial aperture suborbicular, contracted below with two lateral cardelles, the lower margin slightly curved outwards; usually a tubercle below the aperture, which sometimes rises into a well developed mucro; the peristome slightly thickened, unarmed. Frequently frontal avicularia on one side, a little below the aperture, with triangular mandible directed obliquely upwards. Ooecia globose, somewhat depressed in front, thickly covered with punctures of different sizes.



Text-fig. 9. *Lepralia pertusa* (ESPER).
a. Mandible of frontal avicularium ×200.
b. Operculum ×200.

There exist in the collection numerous colonies which may be identified with the above species. They were obtained from the following localities: Yunoshima (Station 1; Sp. no. 483, 638); off Yunoshima (Station 6; Sp. no. 600, 606, 618); off Hanaguri (Station 21; Sp. no. 641), off Itanozaki (Station 31; Sp. no. 423); off Namiuchi (Station 50; Sp. no. 455). They are attached to a stone, a plate of Cirriped and bivalve shells.

In the specimens on hand, two frontal avicularia are usually found on both sides of the zooecial aperture, but infrequently there is only one, or rarely none. The specimen from station 50 (Sp. no. 455), is provided with a somewhat prominent median projection on the frontal surface, just below the lower margin of the zooecial aperture.

16. Lepralia reticulata, n. sp.
(Plate V, fig. 4, 5.)

Diagnosis: Zoaria encrusting, forming an irregular crest. Zooecia large, quadrangular or elongated quadrangular, punctured over the entire gymnocyst with rather large pores, with somewhat elevated thick margin, disposed in lines. Zooecial aperture somewhat large, broader than long, arched above, weakly contracted on each side below the middle, lower margin nearly straight, peristome slightly thickened and elevated, forming a narrow thick border round the aperture. A small bluntly pointed umbo presents below the lower margin of the zooecial aperture. Marginal zooecia without the aperture, entirely perforated with large pores on the surface. Avicularia and ooecia wanting.

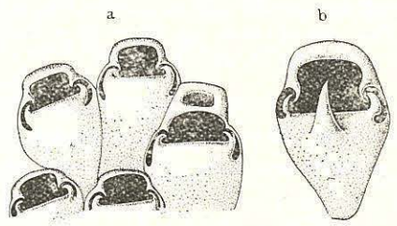
Small and large colonies which may be referable to the above species exist in the collection. They were obtained off Namiuchi (Station 50; Sp. no. 455); at Ôma (Station 104; Sp. no. 2107, 2143) and were attached to coral and shells.

It is worthy to note that the marginal zooecia of the large zoarium show a different zooecial feature from that of the ordinal inner ones. Those are not provided with zooecial apertures (as in the kenozooecia of *Adeonella*), being entirely perforated with large pores, formed a complex network on the frontal surface.

17. Lepralia bilabiata Hincks.
(Plate II, fig. 3; Text-fig. 10.)

Lepralia bilabiata Hincks, 1884, A. M. N. H., vol. 13, p. 49, pl. 3, figs. 1, 1a, 1b. — Robertson, 1908, Univ. Calif. Pub.. Zool. vol. 4, no. 5, pp. 298–300, pl. 21, figs. 61–64.

Diagnosis: Zoarium incrusting. Zooecia short and broad, alternate, rounded above, truncate below; gymnocyst at the outer growing rim almost wholly membranous soon covered over somewhat more than half its surface by a delicate calcareous front wall, convex, slightly granular; in older zooecia, rising into a keel, extending from the lower rim of the operculum to the base of the zooecium, and forming a thick rim, above the large operculum; frontal wall marked by radiating striae and sometimes rising into a distinct umbo. Operculum



Text-fig. 10. *Lepralia bilabiata* Hincks.
a. Few zooecia, one of them bears an ooecium ×20.
b. Zooecium with a spine on frontal wall ×40.

large, brown, occupying almost half the gymnocyst of the zooecium, semicircular above, curved on the lower margin. Ooecia immersed, formed by an extension of the zooecial wall above the operculum and marked by a large pore, covered with a chitinous membrane. No avicularia.

Numerous colonies in the collection are referable to the above species. They were obtained from the following localities: Yunoshima (Station 1; Sp. no. 480); off Yunoshima (Station 6; Sp. no. 619); off Hanaguri (Station 21; Sp. no. 452), off Itanozaki (Station 30; Sp. no. 462); off Itanozaki (Station 31; Sp. no. 423, 439); off Yadonobe (Station 63; Sp. no. 657, 428. 2255); Asadokoro (Station 72; Sp. no. 465); off Fukkoshi (Station 79; Sp. no. 473). They were attached to dead bivalve shells and shell plates of Cirripeds. Most of the specimens are provided with prominent spinous projections, conically pointed at the end, on the middle of the gymnocyst, just below the lower margin of the zooecial aperture.

Genus 14. HIPPODIOPLOSIA Canu 1916.

18. Hippodiplosia pallasiana (Moll).
(Plate II, fig. 4; Plate V, fig. 1.)

Eschara pallasiana Moll, 1803, Seerinde, p. 64, pl. iii, fig. 13.
Cellepora pallasiana Lamouroux, 1816, Hist. Pol. corall. flex., p. 95, no. 190.
Lepralia pallasiana Busk, 1854, Cat. Mar. Pol. Brit. Mus., ii, p. 81, pl. lxxxiii. figs. 1, 2. — Busk, 1859, Crag Pol., p. 54, pl. ix, fig. 7. — Busk, 1863, Quart. Journ. Mic. Sc., iv, p. 309, pl. xi. figs. 1, 2. — Hincks, 1861, A. M. N. H., 3, ix, p. 204. — Smitt, 1868, Krit Fört. Skand. Haf. Bry., iv, pp. 19, 123, pl. xxvi, fig. 93. — Hincks,

1890, Hist. Brit. Mar. Poly., pp, 297–299, pl. xxxiii. figs. 1–3; pl. xxiv, fig. 4. — CORNISH, 1907, Mar. Fish. Rep. Canada, no. 22, p. 77. — OSBURN, 1912, Bull. Bur. Fish., vol. xxx, p. 240, pl. xxv, fig. 54, pl. xxx, fig. 89.

Diagnosis: Zoarium incrusting. Zooecia large, broad-ovate, distinct, coarsely punctured along the entire outer margin of the gymnocyst, disposed in lines; zooecial aperture ample, longer than broad, arched above, contracted on each side below the middle, lower margin slightly curved outwards; the peristome unarmed, thickened; commonly an umbo below the lower margin of the zooecial aperture. Ooecia unknown.

Three small and large colonies in the collection are referable to the above species. They were obtained at the following localities: off Yunoshima (Station 6; Sp. no. 606); off Yadonobe (Station 63; Sp. no. 436); off Tozawa (Station 66; Sp. no. 440). They were attached to stones and to plates of Cirripeds.

In most specimens, the zooecia are provided with a median process on the gymnocyst, somewhat below the lower margin of the zooecial aperture, but in most of these unfrequently it is entirely wanting.

Subfamily c. MICROPORELLAE CANU et BASSLER 1917.
Genus 15. MICROPORELLA HINCKS 1877.

19. Microporella ciliata PALLAS.
(Plate II, fig. 5; text-fig. 11.)

Eschara ciliata var. B, PALLAS, 1766, ELENCH. Zooph., p. 38.

Cellepora cilliata LINN., 1766, Syst. Nat., ed. 12, p. 1286.

Lepralia cilliata JOHNSTON, 1847, Brit. Z., ed. 2, p. 323, pl. lvii. figs. 4, 5. — BUSK, 1854, Cat. Mar. Poly. Brit. Mus., ii, p. 73, pl. lxxiv, figs. 1, 2, pl. lxxvii, figs. 3, 4, 5. — BUSK, 1859, Crag Pol., p. 42, pl. vii. fig. 6.

Porina ciliata SMITT, 1867, Oefv. K. Vetensk. Ak. Förh., pt. ii. p. 26, pl. vi. figs. 126–129.

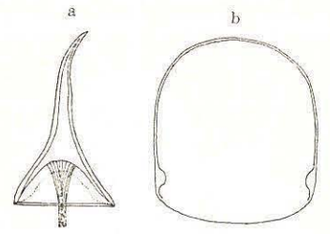
Microporella ciliata HINCKS, 1880, Hist. Brit. Mar. Poly., pp. 206–210, pl. xxviii, figs. 1–8. — NORDGARD, 1918, Bry. from the Arct. Reg., pp. 59–60. — OKADA, 1923, Annot. Zool. Jap., vol. 10, Art. 22, p. 227.

Eschara ciliata PALLAS, 1766, Elenchus Zoophy., p. 38.

Microporella vibraculifera HINCKS, 1883, A. M. N. H., 5, xi, p. 443, pl. xvii, fig. 2.

Diagnosis: Zooecia ovate, obscurely hexagonal, convex, separated

by well-marked sutures and somewhat distinctly punctate, or granular on the gymnocyst, quincuncial, or disposed in radiating lines; zooecial aperture semicircular above, with a slight rim, the lower margin straight, the upper with from five to seven long spines; median pore lunate, a little below the zooecial aperture, frequently borns on a prominent mucro, or sometimes almost hidden behind it. Frontal avicularia on one side or the other, with an acute mandible, directed obliquely upwards or lateral-wards, which is often prolonged into a slender vibraculoid shape. Ooecia globose, areolated round the base, minutely punctate or granular; two spines visible in front of it.



Text-fig. 11. *Microporella ciliata* PALLAS.
a. Mandible of frontal avicularium ×200.
b. Operculum ×200.

A few small colonies in the collection are referable to the above species. They were collected at the following localities: Off Yunoshima (Station 6; Sp. no. 609); Ôshima (Station 15; Sp. no. 479); off Mourakojima (Station 22; Sp. No. 449); off Itanozaki (Station 31; Sp. no. 642); off Jukunohe (Station 63; Sp. no. 603); Ôma (Station 104; Sp. no. 609, 2090) together with *Microporella malusii* (AUD). They were attached to a stem Hydrozoa, stones, a species of sea-weed, Zostera, and to Arca.

20. Microporella malusii (AUDOUIN).
(Text-fig. 12.)

Cellepora malusii AUDOUIN & SAVIGNY, 1811, p. 239, pl. 8, fig. 8.

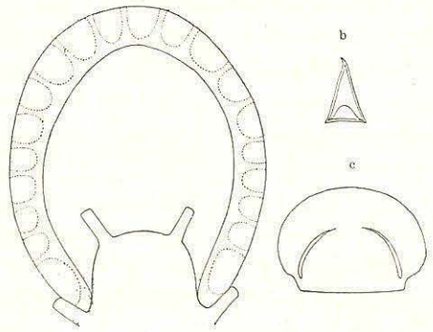
Lepralia malusii JOHNSTON, 1847, Brit. Z., ed. 2, p. 314, pl. 55, fig. 4. — BUSK, 1854, Cat. Mar. Poly. Brit. Mus., pt. 2, p. 83, pl. 103, figs. 1–4. — BUSK, 1859, Crag Pol., p. 53, pl. 8, fig. 3. — WATERS, 1879, A. M. N. H., vol. 3, p. 33.

Reptoporina malusii D'ORBIGNY, 1850–52, Pal. Franc. Terr. Cret., vol. 5, p. 443.

Microporella malusii HINCKS, 1880, Hist. Brit. Mar. Poly., p. 211, pl. 28, figs. 9–11, pl. 29, figs. 1, 2. — BUSK, 1884, Chall. Rep., pl. 30, vol. 10, p. 137. — ROBERTSON, 1908, Univ. Pub. Calif. Zool., vol. 4, no. 5, pp. 282–283, pl. 18, figs. 35–36.

Fenestrulina malusii JULLIEN, 1888, Miss. Scient. Cap. Horn., T. 6, p. 38, pl. 15, figs. 1-3.

Diagnosis: Zoarium incrusting. Zooecia ovate or rhombic, alternate, radiating from a central part; gymnocyst calcareous, punctate, slightly convex; immediately inside the margin a row of stellate pores;



Text-fig. 12. *Microporella malusii* (AUDOUIN).
a. Ooecium seen from the surface ×150.
b. Mandible of avicularium ×150.
c. Operculum ×150.

the center of the gymnocyst occupied by a large lunate, toothed pore. Zooecial aperture straight below, semi-circular above, with four or five marginal spines. Ooecia globose, surrounded by an areolated border.

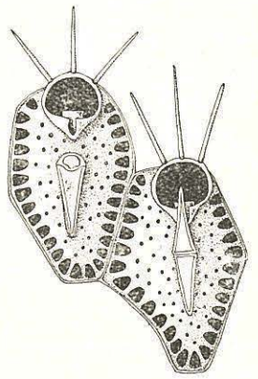
Of this species, there exist in the collection numerous colonies attached to seaweeds. They were obtained off Hanaguri (Station 21; Sp. no. 452).

Family 7. SMITTINIDAE LEVINSEN 1909.
Genus 16. SMITTINA NORMAN 1909.

21. Smittina trispinosa (JOHNSTON).
(Text-fig. 13.)

Discopora trispinosa JOHNSTON, 1838, Ed. Phil. Journ., xiii, p. 322.
Lepralia trispinosa JOHNSTON, 1849, Brit. Z., ed. 2, p. 324, pl. LVII, fig. 7, — BUSK, 1854, Cat. Mar. Poly. Brit. Mus., ii, p. 70, pl. LXXXV, figs. 1, 2, pl. XCVIII, pl. CII, fig. 2. — HINCKS, 1877, A. M. N. H., p. 100, pl. xi, fig. 1. — DARWSON, 1859, Geol. Surv. Canada, p. 256. — PACKWARD, 1867, Proc. Bost. Soc. Nat. Hist., vol. 1, p. 67. — WHITEAVES, 1901, Geol. Surv. Canada, p. 106.

Smittia trispinosa HINCKS, 1880, Hist. Brit. Mar. Poly., pp. 353-356, pl. XLIX, figs. 1–8. — OSBURN, 1912, Bull. Bur. Fish., xxx, p. 246, pl. XXVII, figs. 65, 65 a. — NORDGAARD, 1900, Den. Nors. Nordh. Exp., XXVII, p. 13, pl. 1, fig. 9. — NORDGAARD, 1918, Bry. from the Arct. Reg., pp. 61–62. — OKADA, 1923, Annot. Zool. Jap., vol. 10, art. 22, p. 228.



Text-fig. 13. *Smittina trispinosa* (JOHNSTON). ×40.

Diagnosis: Zoarium encrusting on stones, shells, etc. Zooecia somewhat ovate or elongate ovate, sometimes nearly rectangular, disposed in linear series or quincuncially, separated by raised lines and punctured round the gymnocyst. Zooecial aperture suborbicular; peristome somewhat raised, with a broad deep rimule, a broad lyrula within the lower margin; oral spines 2–4. Avicularia somewhat large, situated a little below the zooecial aperture with an acute mandible directed upwards. Ooecia large, ample, globose, somewhat flattened in front, usually with two or three large pyriform punctures.

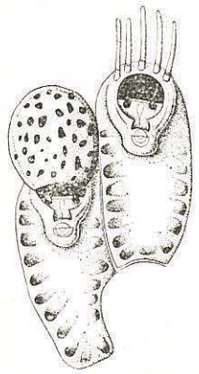
A somewhat large colony which may be identified with the above species exists in the collection. It was obtained at Ôma (Station 104; Sp. no. 2143), attached to a stone.

22. Smittina reticulata (MACGILLIVRAY).
(Text-fig. 14.)

Lepralia reticulata MACGILL., 1842, A. M. N. H., ix, p. 467. — JOHNSTON, 1847, Brit. Z., ed. 2, p. 317, pl. LV, fig. 10. — BUSK, 1854, Cat. Mar. Poly. Brit. Mus., ii, p. 66, pl. XC, fig. 1, pl. XCII, figs. 1, 2.

Smittia reticulata HINCKS, 1880, Hist. Brit. Mar. Poly., pp. 346–348, pl. XLVIII, figs. 1–5. — NORDGARD, 1918, Bry. from the Arct. Reg., p. 60. — NORDGARD, 1900, Den. Nors. Nordh.-Exp., XXVII, p. 13.

Diagnosis: Zoarium incrusting. Zooecia ovate-elongate, in linear series, separated by raised lines, strongly areolated round the margin of the gymnocyst, smooth or slightly roughened. Zooecial aperture



Text-fig. 14. *Smittina reticulata* MacGill.
Two zooecia one of them with an ooecium ×65.

orbicular, with a thin raised cryptocyst and a deeply channelled rimule in the lower lip, lyrula rod-like, largest, and cardelles small. Avicularia with an acute mandible pointed downwards, situated immediately below the sinus. Ooecia semicircular or globose, prominent, punctured, the elevated peristome in front giving them a hooded appearance.

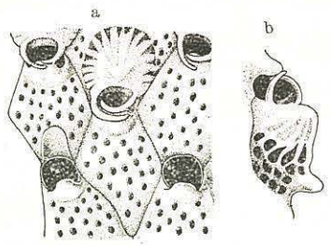
A complete circular colony which may be identified with the above species exists in the collection. It was obtained off Yunoshima, attached to Ascidea (*Chelyosoma siboya* Oka).

Genus 17. MUCRONELLA Hincks 1880.

23. **Mucronella hozawai**, n. sp.

(Plate II, fig. 6; Plate V, fig. 2; Text-fig. 15.)

Diagnosis: Zoarium encrusting on seaweeds, forming a thin, nearly circular crest. Zooecia elongated oval, distinctly separated, disposed in radiating rows or in linear series, punctured sparsely on the gymnocyst except along the zooecial aperture. Zooecial aperture somewhat semi-circular, arched above, and the lower margin nearly straight, with a distinct broad elevated cryptocyst. Avicularia wanting. Ooecia prominent, globular, unpunctured, with a small umbo on the centre and with the indistinct radiating lines on the outer margin. Two curved spines are projected backwards from both corners of



Text-fig. 15. *Mucronella hozawai* n. sp.
a. Few zooecia one of them with an ooecium ×20.
b. Side view of zooecium ×40.

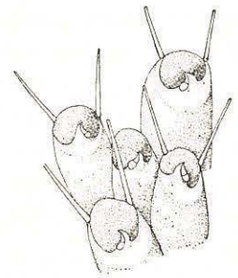
the lower margin, the ends often crossing in the middle.

Several colonies of this new species exist in the collection. They were obtained at Kawauchi (Station 64; Sp. no. 644), off Tozawa (Station 66; Sp. no. 635) and were attached to *Zostera* and other sea-weeds.

24. **Mucronella takatukii**, n. sp.

(Text-fig. 16.)

Diagnosis: Zoaria incrusting on seaweeds or substratum. Zooecia tubular, arranged in linear series, gymnocyst thin, delicate; zooecial aperture circular with an elevated lower margin, and with two long spines on the upper margin. Oral avicularium small, with pointed and curved mandible, is situated at the centre of the lower elevated margin. Ooecia unknown.



Text-fig. 16. *Mucronella takatsukii* n. sp. ×40.

Two colonies were obtained off Tozawa (Station 66; Sp. no. 622) and at Ôma (Station 104 Sp. no. 2171).

Family 8. RETEPORIDAE Smitt 1867.
Genus 18. RETEPORA Imperato 1599.

25. **Retepora terebrata** Buchner.

(Plate III, fig. 1; Plate V, fig. 3.)

Retepora terebrata Buchner, 1924, Zool. Jahrb. Syst., bd. 48, pp. 191–193, taf. 17, figs. 1–2, text-fig. n. p.

Diagnosis: Zoarium erect, forming a somewhat large convoluted mass, growing from an incrusting disk or with a short peduncle. Fenestrae oval or elliptical, about three to four times as long as wide. Zooecia somewhat large, arranged biserially in alternate arrangement; gymnocyst nearly smooth on the surface, sloping upward from the side to the median line, perforated by two or three, small, circular pores. Zooecial aperture nearly semicircular on the upper margin, with a somewhat deep rimule on the lower. Frontal avicularium

large, present on most zooecia, much elevated on centre of the gymnocyst, with a triangular, obtuse mandible directed obliquely upward. Ooecia relatively small, subspherical, smooth-surfaced, with a small peak in the middle of lower margin. Dorsal surface nodulous, frequently perforated by a few small pores, with somewhat irregularly developed vibices, on some of which there is an occurrence of a smaller avicularium than that of the ventral surface.

Numerous large and small colonies and fragments of the above species were obtained from following localities: off Hanaguri (Station 12; Sp. no. 435); Futagojima (Station 26; Sp. no. 647; 656); off the Biological Station (Station 28; Sp. no. 453); off Itanozaki (Station 30; Sp. no. 447, 462 (a), 474 1935); off Itanozaki (Station 31; Sp. no. 441, 465), off Ôshima (Station 39; Sp. no. 458); off Hanaguri (Station 469; Sp. no. 469); off Namiuchi (Station 51; Sp. no. 477), off Ozawa (Station 62; Sp. no. 432); off Jukunohe (Station 63; Sp. no. 428, 463), Asadokoro (Station 72; Sp. no. 467); off Shimizugawa (Sfation 73; Sp. no. 474, 4421); off Karibazawa (Station 74; Sp. no. 446, 443, 433); off Noheji (Station 75; Sp. no. 427); off Akemae (Station 76; Sp. no. 630, 637), off Fukkoshi (Station 79; Sp. no. 604, 473 a); off Ushinosawa (Station 80; Sp. no. 633); Ôma (Station 104; Sp. no. 2121); off Yunoshima (Sp. no. 2258), off Tsubakiyama (Sp. no. 1678), off Noheji (Sp. no. 1827).

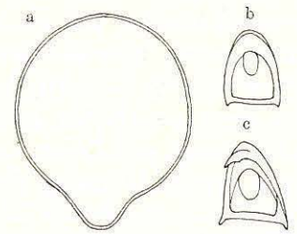
They were attached to a stone, worm-tube, Hydrozoa and bivalve shell etc. It is interesting to note that the Reteporan species of Mutsu Bay is represented only by the present species.

Family 9. CELLEPORIDAE Busk 1852.
Genus 19. CELLEPORA Linnaeus 1767.

26. Cellepora incrassata Lamarck.
(Plate III, fig. 2; Plate V, fig. 6; Text-fig. 17.)

Cellepora incrassata Lamarck, 1856, Ency. méth., ed. 2, vol. 2, p. 256. — Smitt, 1867, Oefv. K. Vetensk.-Ak. Förh., p. 33, figs. 212–216. — Smitt, 1868, Kritisk För. öfver Skand. Hafs-Bry., pp. 198–200, taf. xxviii, figs. 214–215. — Hincks, 1877, A. M. N. H., vol. 19, p. 105. — Robertson, 1900, Proc. Wash. Acad. Calif. Pub., vol. 4, pp. 312–313, pl. 24, fig. 187, 88.

Diagnosis: Zoarium forming coarse, rounded nodules, incrusting seaweed. Zooecia large, round, decumbent in young colonies becoming erect in older portions of the colony and piled one on top of the other; gymnocyst soon becoming heavily calcified and punctured with large pores. Primary orifice, rounded on the upper peristome with a well pronounced rimule on the lower peristome; secondary orifice orbicular; on each side an avicularium somewhat elevated, the two often inclined toward each other; mandible directed slightly away from the zooecial aperture; avicularia frequently lacking exception zooecia that bear ooecia. Ooecia, relatively small, decumbent, rounded, smooth, broader than high, a triangular portion, in front of which it is thin, and perforated by numerous pores in radiating rows.



Text-fig. 17. *Cellepora incrassata* Smitt.
a. Operculum ×200.
b. Mandible of oral avicularium ×200.
c. Mandible of frontal avicularium ×400.

Numerous colonies of the above species from the following localities: Yunoshima (Station 1; Sp. no. 480), off Yunoshima (Station 6; Sp. no. 620); Ôshima (Station 15; Sp. no. 456 4597); Futagojima (Station Sp. no. ?); off Itanozaki (Station 30; Sp. no. 1935 b), off Itanozaki (Station 31; Sp. no. 423); off Ôshima (Station 39; Sp. no. 625); off Ishihama (Station 43; Sp. no. 468), off Namiuchi (Station 51; Sp. no. 614), off Akemae (Station 76; Sp. no. 482 (b), 651); off Fukkoshi (Station 79; Sp. no. 473 b); off Yokohama (Station 81; Sp. no. 431); Ôma (Station 104; Sp. no. 2169).

They form small cubical or irregular shaped masses and are attached to *Hydrozoa*, worm-tubes, stones, sea-weeds, dead bivalve shells and the thorasic appendage of crabs.

Genus 20. COSTAZZIA. Neviani 1895.

27. Costazzia costazi Audouin.
(Plate III. figs. 3–5.)

Cellepora costazii Audouin, 1826, Explic. des planch. de M. Savigny.
Cellepora costazii Hincks, 1880, Hist. Brit. Mar. Poly., p. 411, pl. 55, fig. 11–14. — Robertson, 1908, Univ. Calif. Pub. Zool., vol. iv. pp. 313–314, pl. 21, fig. 89.

Diagnosis: Zoarium incrusting or growing in ball-like or discoidal masses. Zooecia decumbent, somewhat erect, disposed irregularly and crowded together one on top of another, gymnocyst perforated by large pores; zooecial aperture suborbicular, with a rimule on the lower margin; becoming deeply sunk secondarily by the growth of the peristome, bearing an erect process on each side of the aperture with a small avicularium on its summit. Interzooecial avicularia scattered irregularly among the zooecia, with a spatulate, large mandible. Ooecia decumbent, rounded, smooth, much broader than high, with an area in front pierced by large pores.

There exist numerous colonies which may be identified with the above species, in the collection. They were obtained from the following localities: Yunoshima (Station 2; Sp. no. 448); off Yunoshima (Station 6; Sp. no. unknown), off Hanaguri (Station 21; Sp. no. 452), off Futagojima (Station 26; Sp. no. 621, 654), off Futatsuya (Station 44; Sp. no. 616); off Wakinosawa (Station 61; Sp. no. 429); off Kozawa (Station 62; Sp. no. 437); off Tozawa (Station 66; Sp. no. 622); off Shimizugawa (Station 73; Sp. no. 605 unknown), off Noheji (Station 75; Sp. no. 424); off Tomarikawa (Station 78; Sp. no. 470); off Ushinosawa (Station 80; Sp. no. 422); Takaisozaki (Station 102; Sp. no. 2029), Ôma (Station 104; Sp. no. 2146), Ôma Bay (station 105; Sp. no. 2186).

They were attached to stones and sea-weed. It is interesting to note, that the zoarium of this collection exhibits a variable outer configuration, forming frequently a cubical mass, infrequently a discoidal convex thickened mass, and occasionally an irregular incrusting mass. Seen as to the outer configuration, they may be separated into distinct species, but from the zooecial features they are included under the same species.

September 29, 1928.

PLATE I

Fig. 1. *Bugula neritina* LINNAEUS ×1.
Fig. 2. *Caberea hatai*, n. sp. ×1.
Fig. 3. *Menipea occidentalis* var. *catalinensis* ROBERTSON ×1.
Fig. 4. *Hippothoa hyalina* (LINNAEUS) ×1.
Fig. 5. *Schizomavella galeata* (BUSK) ×1.
Fig. 6. *Schizoporella crustacea* LORENZ ×1.

PLATE II

Fig. 1. *Lepralia foliacea* (ELLIS & SOLANDER) ×2.
Fig. 2. *Lepralia pertusa* (ESPER) ×1.
Fig. 3. *Lepralia bilabiata* HINCKS ×1.
Fig. 4. *Hippodiplosia pallasiana* (MOLL) ×1.
Fig. 5. *Microporella ciliata* PALLAS ×1.
Fig. 6. *Mucronella hozawai*, n. sp. ×1.

PLATE III

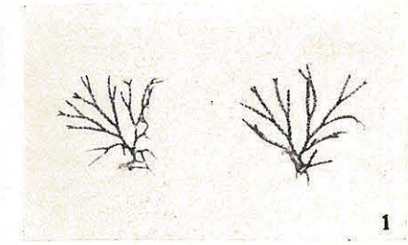
Fig. 1. *Retepora terebrata* BUCHNER ×1.
Fig. 2. *Cellepora incrassata* SMITT ×1.
Fig. 3. *Costazzia costazi* (AUDOUIN) ×1.
Fig. 4. *Costazzia costazi* (AUDOUIN) ×1.
Fig. 5. *Costazzia costazi* (AUDOUIN) ×1.

PLATE IV

Fig. 1. *Ellisina crenulata*, n. sp. ×5.
Fig. 2. *Caberea hatai*, n. sp. ×5.
Fig. 3. *Hippothoa hyalina* (LINNAEUS) ×5.
Fig. 4. *Schizomavella galeata* (BUSK) ×5.
Fig. 5. *Schizoporella crustacea* LORENZ ×5.
Fig. 6. *Hippoponella hippopus* (SMITT) ×5.
Fig. 7. *Lepralia foliacea* (ELLIS & SOLANDER) ×5.
Fig. 8. *Lepralia pertusa* (ESPER) ×5.
Fig. 9. *Lepralia pertusa* (ESPER) ×5.

PLATE V

Fig. 1. *Hippodiplosia pallasiana* (MOLL)
Fig. 2. *Mucronella hozawai*, n. sp. ×5.
Fig. 3. *Retepora terebrata* BUCHNER ×5.
Fig. 4. *Lepralia reticulata*, n. sp. ×5.
Fig. 5. *Lepralia reticulata*, n. sp. ×5.
Fig. 6. *Cellepora incrassata* SMITT ×5.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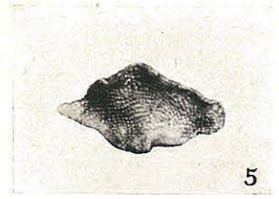
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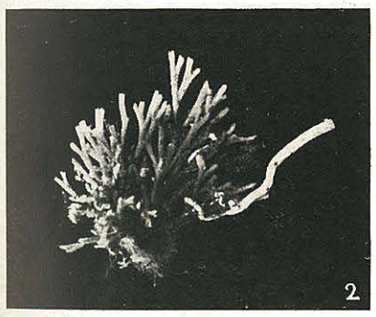
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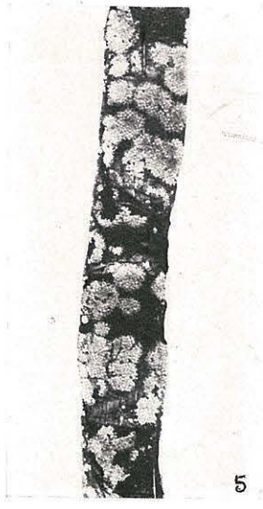
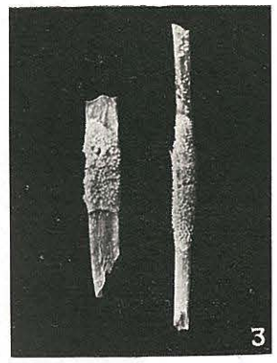
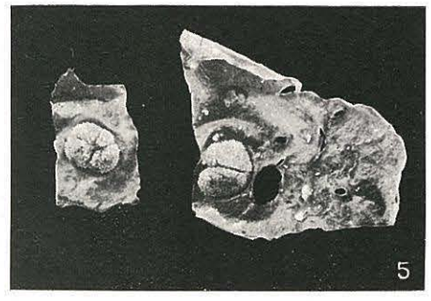
Y. Okada : Cheilostomatous Bryozoa of Mutsu Bay.

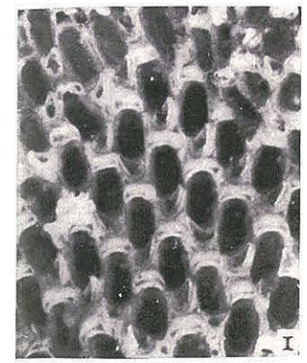
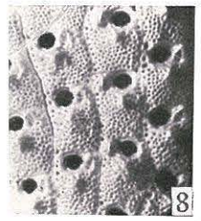
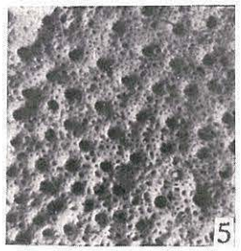
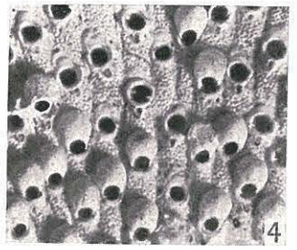
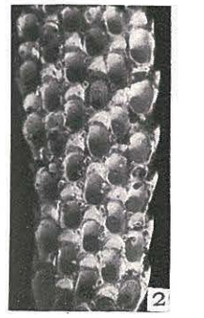
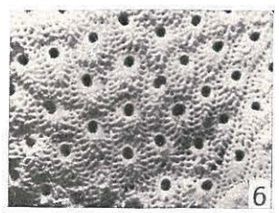
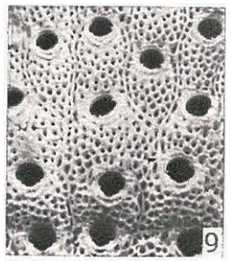
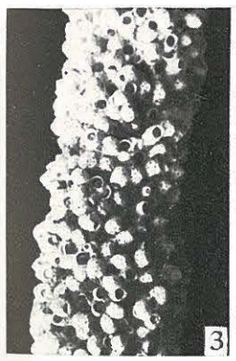
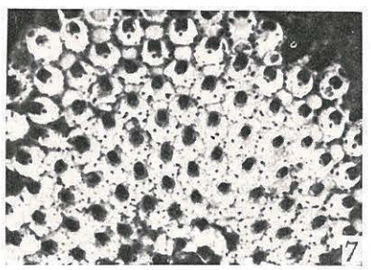


Y. Okada : Cheilostomatous Bryozoa of Mutsu Bay.

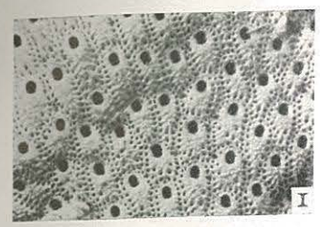




Y. Okada: Cheilostomatous Bryozoa of Mutsu Bay.

Y. Okada: Cheilostomatous Bryozoa of Mutsu Bay.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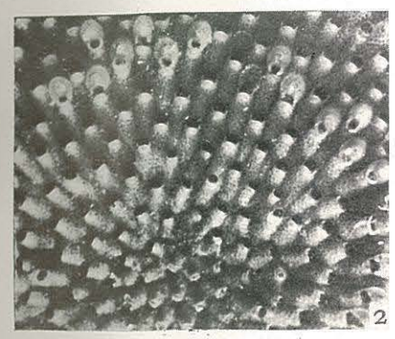
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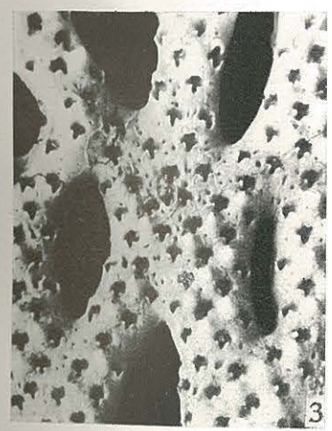
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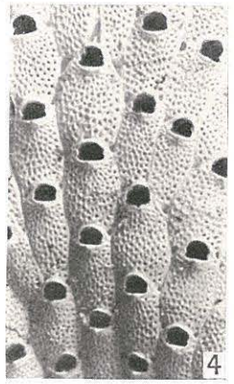
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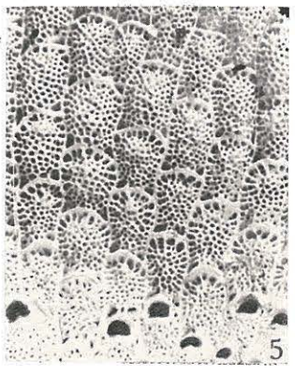
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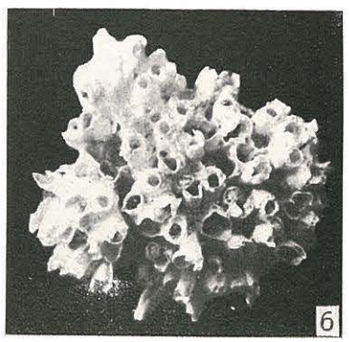
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Y. Okada: Cheilostomatous Bryozoa of Mutsu Bay.