HOKKAIDO UNIVERSITY

Title	On Two Bryozoans from Hokkaido (With 3 Text-figures)
Author(s)	MAWATARI, Shizuo
Citation	北海道大學理學部紀要, 13(1-4), 78-84
Issue Date	1957-08
Doc URL	https://hdl.handle.net/2115/27205
Type	departmental bulletin paper
File Information	13(1_4)_P78-84.pdf

Hokkaido University Collection of Scholarly and Academic Papers : HUSCAP

On Two Bryozoans from Hokkaido

By
Shizuo Mawatari

(Research Institute for Natural Resources, Tokyo)

(With 3 Text-figures)

By the courtesy of Mr. Mayumi Yamada of the Hokkaido University a beautiful specimen of a Cellularine Bryozoa was sent to me for identification. The specimen was found accompanied by an another fragment of quite a different species, and both of these two proved very interesting from a taxonomical viewpoint. On presenting this short report in honour of Dr. T. Uchida's 60th birthday I wish to express my gratitude to Mr. M. Yamada for his kind offer of specimens.

Bugulicellaria gen. nov.

Zoarium free, branches dichotomous, internodes unilaminar and biserial. Opesia with no spine, no scutum and vestigial gymnocyst. Marginal avicularia constant, sessile. Ooecium hyperstomial, sessile. No basal heterozooecia. Ends of F and G meet on E.

Monotypical genotype: *Bugulicellaria yezoensis* sp. nov. The genus may be included in the Scrupocellariidae, near *Tricellaria*.

Bugulicellaria yezoensis sp. nov.

Diagnosis: Zoarium tree-shaped with fibrous stem and thick branches. Internodes long, delicate, biserial. Zooecia elongate, thin-walled, truncate below; frontal wholly membranous with vestigial gymnocyst. No spines, no scuta. Avicularia marginal, sessile. Ooecia hyperstomial, globose, with dotted inner layer. Single multiporous rosette-plate at the proximal end. Polypide with 21 tentacles, rather small. Worm-like body, globular brown body and elliptical egg often present.

Description: The zoarium is bushy or tree-shaped, about 8 cm. in height and beautiful with a stout stem, several dichotomous branches and numerous spreading internodes. The main stem is rather stout, about 2 mm. in diameter, consisted of a bundle of thickened rootfibres which extend beyond the stem and attach to small pebbles or sand grains. The diverging branches are also composed of a bundle of rootlets surrounding the zooecial axis and extend in every direction at intervals of 2 or 3 mm. The stems and branches are pale yellowish brown in spirit.

Contributions from the Research Institute for Natural Resources, No. 835.

Jour. Fac. Sci. Hokkaido Univ. Ser. VI. Zool. 13, 1957 (Prof. T. Uchida Jubilee Volume).

The distal part of branches is divided into numerous internodes which are thin, semi-transparent and composed of 10 to 15 alternate zooecia arranged biserially.

The zooecium is elongate quadrangular, attenuated below and truncate at the proximal end on the dorsal surface. The frontal is wholly occupied by the membranous opesia as usual, and the proximal gymnocyst is wanting. Only on the first inner zooecia at the bifurcation presents the narrow and vestigial gymnocyst.

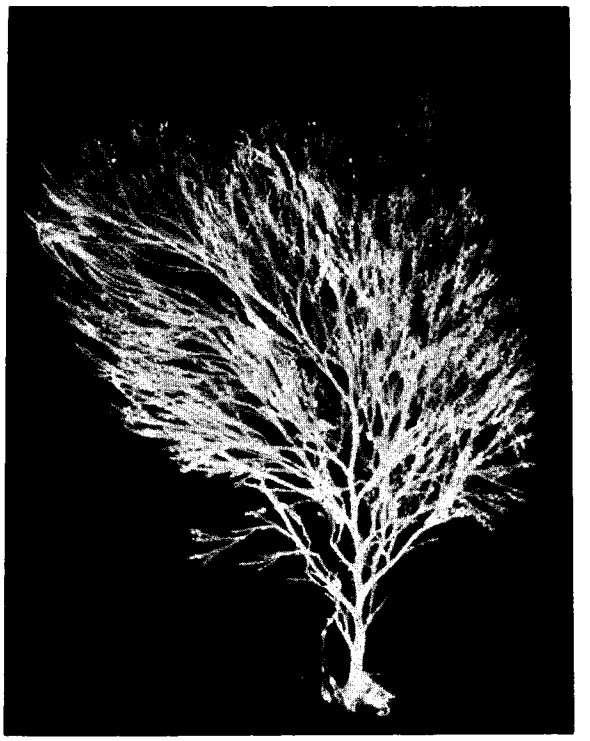
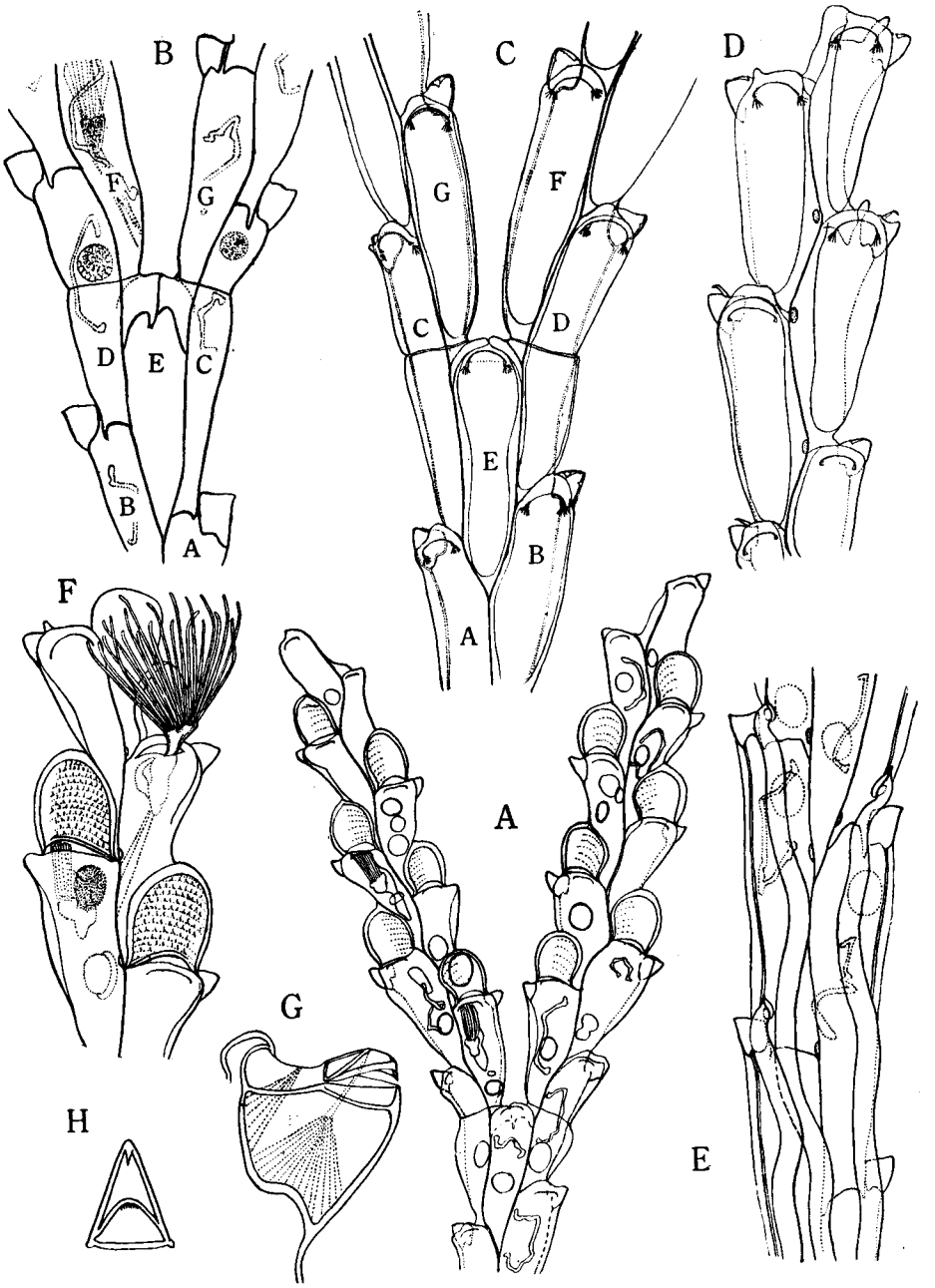


Fig. 1. *Bugulicellaria yezoensis* n. sp. ×1.

The lateral walls are thin, a little produced and provided with no spines or scuta. A small, indistinct spinous process often occurs on the outer distal margin of the youngest zooecium at the growing end of the uppermost internodes. The process or a mere protuberance, however, seems to disappear soon by the growth of the proximal end of the distal zooecium.

A small sessile avicularium constantly occurs at the outer distal end of each zooecium. The avicularian chamber is always distinctly sinuated in its proximal outline and a thickened longitudinal sclerite runs down from its end to the lower


B
F
G
D
E
C
B
A
C
G
F
C
D
E
B
A
D
F
A
G
H
E

zooecium. A strong adductor muscle with long tendon attaches to the median sclerite of the triangular mandible and a smaller one inserts at the inner membranous part. The marginal sclerite and a strong terminal spike of the mandible fit to the beak of the avicularium.

There occur no trace of the heterozooecia such as vibracula or root chambers on the dorsal surface of the zooecia.

The ooecium is hyperstomial, large, globose or hood-like with weakly pointed end and depressed dorsal wall partly immersed in the lower part of the succeeding zooecium. The calcareous outer layer is thin and transparent, but the inner layer is, on the contrary, thick and opaque with a number of minute dotted depressions. Rootfibres emanate from the dorsal wall near the bottom of zooecia.

The polypide is rather small with shortened alimentary canal, but tentacles are long and delicate, usually 21 in number. A peculiar worm-like cell mass is seen in numerous zooecia without functional polypide extending along the zooecial axis. A circular brown-body is also found in many zooecia. The fertilized egg is elliptical in shape and when it is transferred into the ooecium there can be seen another smaller one near the bottom of the zooecial cavity.

The specimen was collected at a spot off Kushiro, Hokkaido and deposited in the Department of Zoology, Faculty of Science, Hokkaido University.

Affinities: The present species is peculiar in uniting certain characters possessed by the Scrupocellariidae and the Bicellariellidae, and seems necessary to propose a new genus for its reception.

The sessile marginal avicularia at the outer distal angle, the terminal hood-like hyperstomial ooecia without stalk and the attached inner proximal ends of F and G zooecia at the bifurcation are all the characters of the Scrupocellariidae. The wholly membranous opesia with no spines or scuta and the bare dorsal surface without any kind of heterozooecia are, on the other hand, the characteristics peculiar to the Bicellariellidae.

General appearance of the tree-shaped colony resembles that of *Bugula*, and the large membranous frontal is similar to those of some genera of the Bicellariellidae, but differs greatly from that genus in ooecia and marginal avicularia.

The similar mode of attachment of F and G on the dorsal side of E is known to occur in *Tricellaria* and *Menipea*, but the character of the frontal differs from those of them.

Fig. 2. *Bugulicellaria yezoensis* n. sp.
A. Two fertile internodes near the growing end. (× 10) B. Dorsal view of the bifurcation point. (×25). C. The same in frontal aspect. (×25). D. Young zooecia at the growing end, with a minute process disappearing. (×25). E. Three rootlets in dorsal view. (×25). F. Extended polypide and ooecia. (×25). G. Sessile marginal avicularium. (×100). H. Mandible. (×100).

Corynoporella japonica sp. nov.

Diagnosis : Zoarium free, dichotomous; branches uniserial. Zooecia elongate tubular : opesia with raised margin. Four minute distal processes and a large articulated avicularium on the opesial margin. Dorsal calcified plate at the biginning of the succeeding zooecium.

Description : The specimen at hand is a fragment of the delicate colony which might be an erect bushy tuft in its complete form. The fragment consists of several dichotomous branches or internodes composed of a series of 2 to 5 zooecia. A new zooecium grows from the dorsal surface of the terminal portion of the preceding one, and at the bifurcation an another one starts from a close point at the same portion. A thickened calcareous plate always presents, surrounding the starting point of a new zooecium. A large central and two small lateral fenestrae occur in this calcareous plate, and from a central one starts a new zooecium.

The zooecium represents much elongate tubular gymnocyst gradually attenuated proximally and elongate oval opesium with four minute spinous processes on its distal margin. The opesium is surrounded by a raised border, and occupies less than half of the length of the zooecium. No distinct operculum with chitinous thickening is observed, but a mere slit represents a zooecial orifice. The proximal end of the first zooecium of a branch is usually slightly constricted and less calcified than the other part of the gymnocyst, probably to give a necessary elasticity to the zoarium.

A very large articulated avicularium frequently occurs near the middle of the outer lateral border of the opesium. The beak is stout and strongly curved upwards, and the body is globose to form a hemisphere. The mandible is triangular with strong marginal sclerites and strong terminal spike.

No ooecium and no rootlet have been observed, but it seems probable that a rootfibre may start from one of the two small lateral fenestrae of the calcified plate.

The specimen seems to be dead when collected and there can be seen no functional polypide.

Locality : Off Kushiro, Hokkaido. Depth unknown.

Affinity and discussion : The species is clear to be very closely related with *Corynoporella tenuis* Hincks 1888 which is provided with similar articulated avicularia, but easily distinguishable by the occurrence of four distal processes and a thickly calcified terminal plate on the dorsal wall.

In general appearance of the colony and zooecia, the species is also close to *Brettia frigida* Waters 1900, but differs in the presence of the peculiar articulated avicularium, four terminal spinous processes and the calcareous dorsal thickening. Hincks figured a root-fibre in *C. tenuis* starting from a ring-like structure on the dorsal surface a little below the summit of the zooecium towards one side, and Waters described in *B. frigida* that the zooecium is provided "with one distal or

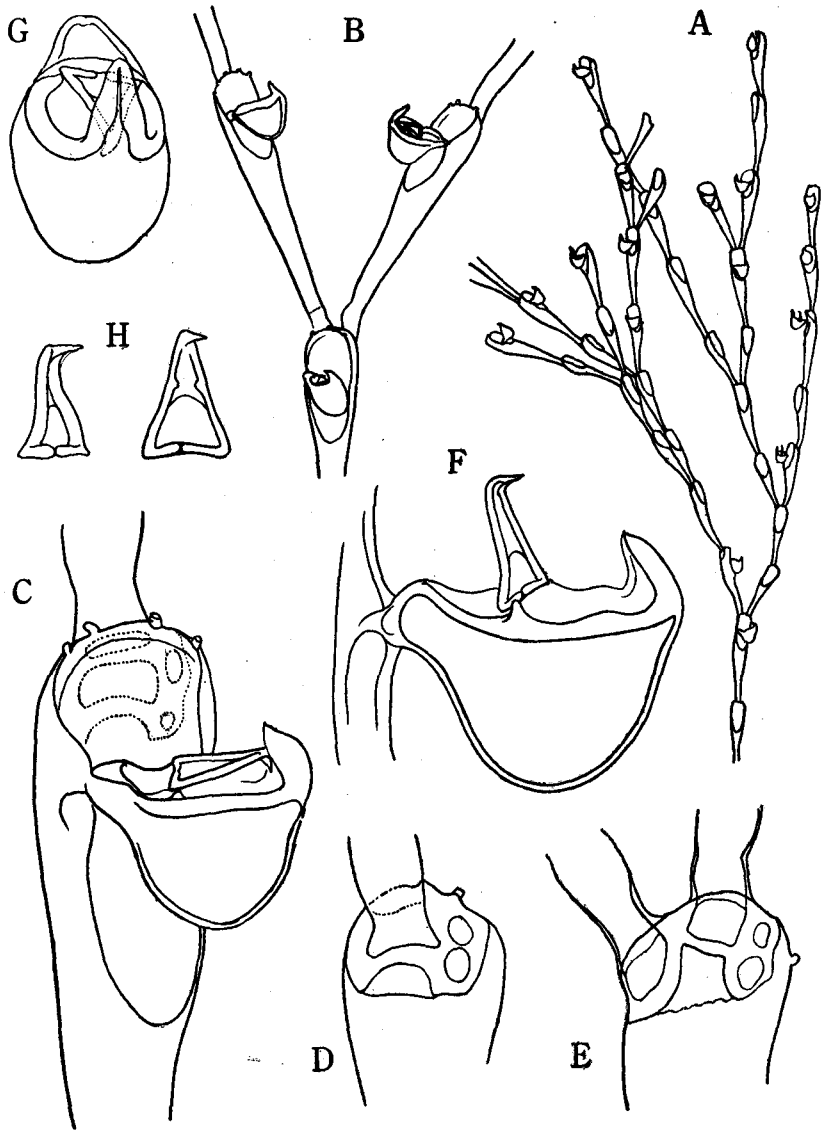


Fig. 3. *Corynoporella japonica* n. sp.

A. Part of the fragment. (×10). B. Bifurcation point. (×25). C. A zooecium with globose avicularium and calcareous thickening in frontal view. (×100). D. Calcareous plate in dorsal aspect. (×100). E. Calcareous plate at bifurcation. (×100). F. Avicularium. (×100). G. Avicularium in frontal view. (×100). H. Two mandibles. (×100).

central rosette-plate and two lateral." and the radicle tubes "grow from the distal end." These description seems to suggest that at least one of the two lateral fenestrae in the calcified thickening may represent a rootlet foramen.

Although Waters did not say anything about this calcified portion he figured an area surrounding the distal end of the dorsal surface (Pl. 7, figs. 3 and 7), that suggesting the thickened area.

The genus *Corynoporella* was proposed by Hincks (1888) for a form similar to those of *Brettia* but with an articulated avicularium at the side of the opesium, and was treated by Waters as superfluous. The older genus *Brettia* Dyster 1858 was defined to have single rowed zooecia, long tubular gymnocyst, restricted opesia with raised margin, and rootlets starting from the dorsal surface at the distal end.

The difference between these two genera then falls only in the presence or absence of the articulated avicularium. If it be true that the differentiation of the polymorphic structure is important in the evolution of the Bryozoa, the establishment of *Corynoporella* may be rather reasonable. I believe also that *Corynoporella* is very important to indicate an aproach to the family Bicellariellidae and especially to *Dendrobeania* in the presence of the similar calcareous thickening on the dorsal surface at the distal end.

The fact may be quite noticeable that Canu and Bassler (1929) treated the above-mentioned *Brettia frigida* Waters as a forma of *Dendrobeania murrayana* Johnston. As they introduced the figure of Waters showing the distal area on the dorsal surface, their opinion seems to be based mainly upon the structure of the thickened area.

I can not agree with them to place *Brettia frigida* Waters under *Dendrobeania*, but I think *Corynoporella* may be a step from *Brettia* to *Dendrobeania*.

Although the material at hand is a mere fragment, it seems worthy of definition in carrying all important characteristics.

Literature cited

Canu, F. and R.S. Bassler 1929. Bryozoa of the Philippine Region. Bull. U.S. Nat. Mus. 100 : 1-685, pls. 1-94, 224 figs.

Harmer, S. F. 1923. On Cellularine and other Polyzoa. Journ. Linn. Soc. Zool. 35 : 293-361, pls. 16-19.

———— 1926. The Polyzoa of the Siboga Expedition. Part 2. Cheilostomata, Anasca. Siboga Exped. 28b : 181-501, pls. 13-34, 23 figs.

Hincks, T. 1888. Polyzoa of the St. Laurence. Ann. Mag. Nat. Hist. VI, 1 : 214-227, pls. 14-15.

Silén, L. 1941. Cheilostomata Anasca (Bryozoa) collected by Prof. Dr. Sixten Bock's expedition to Japan and the Bonin Islands. Ark. Zool. 33 A. 12 : 1-130, pls. 1-9, 183 figs.