The Fauna of Akkeshi Bay
XII Calcarea[1)]

By

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(*With 6 textfigures*)

The calcareous sponges dealt with in the present work were collected by Professor T. Uchida, Messrs. Yoshine Hada, Masao Iwasa, Shiro Okuda and Hoshio Ishizuka during the survey of Akkeshi Bay, Hokkaido. The writers wish to express their sincere thanks to these gentlemen who kindly placed the material at their disposal for study. The materials are referable to three species listed below, and two of these seem to be new to science.

Family Heteropiidae

1) *Grantessa nemurensis* HÔZAWA

Family Grantiidae

2) *Grantia uchidai*, n. sp.

3) *Leucandra cerebrum*, n. sp.

1. Grantessa nemurensis HÔZAWA

(Textfig. 1)

Grantessa nemurensis, HOZAWA, 1929, pp. 315-318, Pl. V., figs. 28, 29; textfig. 15.

This species is represented in the collection by two specimens, the smaller one being ill preserved. The larger specimen (Textfig. 1) forms an irregularly shaped colony, height about 32 mm; breadth 38 mm; thickness about 20 mm. The colony is composed of numerous tubes which stand nearly erect and are often branched and anastomsed with one another. Each of the tubes is broad at its base and tapers towards the upper end where the small osculum opens. It measures 9–22 mm in length and

Textfig. 1. *Grantessa nemurensis* Hôzawa. ×1.5

1) Contribution from the Akkeshi Marine Biological Station, No. 35.

1–2.7 mm in diameter being measured in the lower parts. The thickness of the wall is very thin. The osculum at the upper end of the tube is either circular or slit-like in shape and is nearly naked. The dermal surface is slightly hispid while the gastral is very rough owing to the projection of long apical rays of gastral quadriradiates.

The colour in alcohol is greyish white.

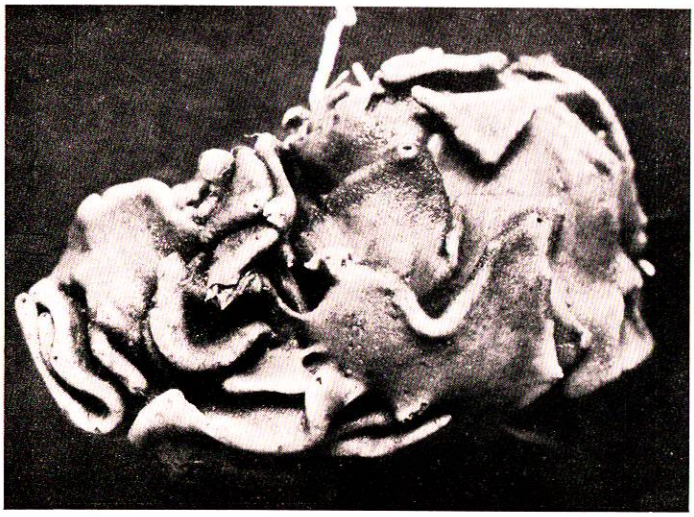
With respect to the inner structure, spiculation, etc. the present specimen is identical with the type of this species described by Hôzawa.

Localities:—off Nemuro (Hôzawa); Akkeshi Bay in Hokkaido.

2. Grantia uchidai, n. sp.

(Textfigs. 2~4)

Three specimens of this new species exist in the collection. All specimens are massive colonies of foliaceous individuals. The largest specimen (Textfig. 2), upon which the following description

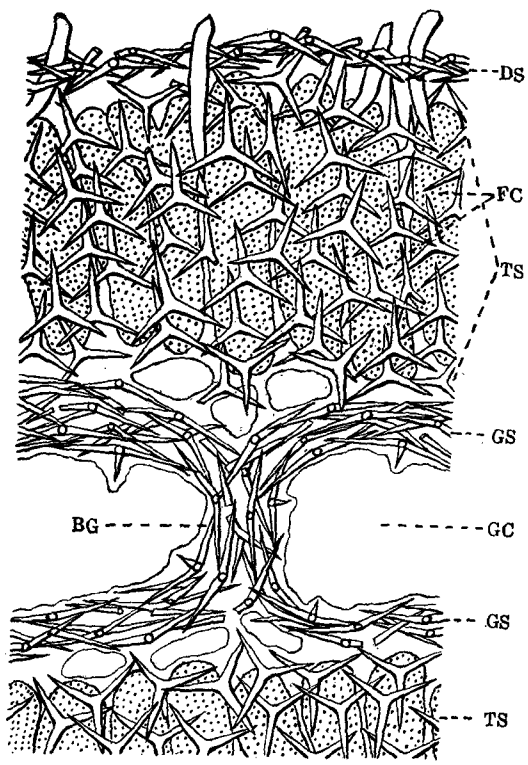


Textfig. 2. *Grantia uchidai*, n. sp. ×1.5

was based, is a colony of many individuals, united together at their bases. The colony is 70 mm in length, 30 mm in height, and 45 mm in breadth. Each individual has a strongly compressed leaf-like form, broad at base and somewhat tapering towards the osculum. Along the upper edge of each individual there are found from one

to three oscula. Each of the oscula is naked and is either circular or oval in shape with a diameter of about 1–2 mm. The larger individuals measure up to about 30 mm in length, 40 mm in breadth and 2.5 mm in thickness.

Structures (Textfig. 3) :—The dermal surface is slightly rough



Textfig. 3. *Grantia uchidai*, n. sp. Part of a horizontal section; ca. ×60. BG, bridge connecting both gastral surfaces; DS, dermal skeleton; FC, flagellate chambers; GC, gastral cavity; GS, gastral skeleton; TS, tubar skeleton.

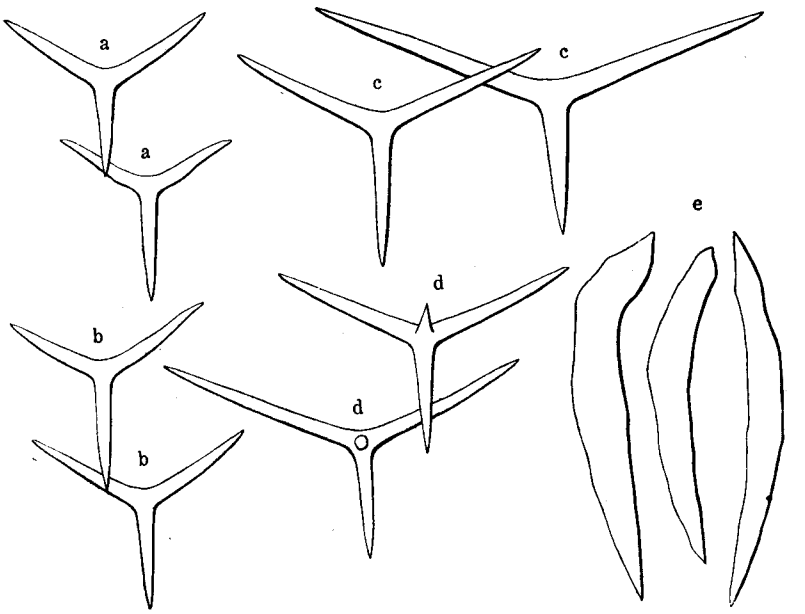
on account of projecting oxea. The sponge body is strongly compressed and thus the gastral cavity (GC) becomes very narrow, the gastral surfaces of both sides approaching each other very closely. Moreover, it is divided into many compartments by means of bridges (BG) connecting both surfaces. The bridges are composed mainly

of spicules which are exactly the same as those forming the gastral skeleton (GS).

The canal system of this species is of syconoid type. The flagellate chambers (FC) are of elongated sac-like shape, straight and either unbranched or divided into two branches in distal parts. They are arranged radially around the gastral cavity (GC) and are nearly circular in cross-section, measuring 380–780 μ in length and 75–160 μ in diameter at the broadest parts.

The dermal cortex (DS) is very thin and is composed of tangentially placed triradiates in a few layers. Amongst these spicules the large oxea are distributed at nearly right angles to the dermal surface.

The skeleton of the chamber layer (TS) is nearly articulate, being made up of tubar triradiates in several layers.



Textfig. 4. *Grantia uchidai*, n. sp. a, dermal triradiates; b, tubar triradiates; c, gastral triradiates; d, gastral quadriradiates; e, large oxea. (a—d ×150; e ×120)

The gastral skeleton (GS) is thicker than that of the dermal and consists of triradiates lying tangentially in several layers. There may be added tangential quadriradiates which are in very

spare distribution. The bridges connecting the two gastral surfaces are said to be the continuation of the gastral skeleton, being made up of the same kinds of spicules as those of the gastral skeleton.

Spicules (Textfig. 4) :—Dermal triradiates (a) subregular or slightly sagittal. Basal ray straight, tapering to sharp end, not greatly different in length from paired rays, 80–120 μ long and 12–16 μ thick at base. Paired rays nearly equal, slightly curved forwards, 95–120 μ long and 12–16 μ thick at base.

Tubar triradiates (b) similar to dermal triradiates in shape but slightly thinner than the latter. Basal ray straight, sharply pointed, 90–120 μ long and 10–14 μ thick at base. Paired rays equal or slightly unequal, 85–110 μ long and 10–14 μ thick at base.

Gastral triradiates (c) sagittal. Basal ray straight, shorter than paired rays, 90–140 μ long and 12–16 μ thick at base. Paired rays nearly equal, straight or slightly curved forwards, 160–190 μ long and 12–16 μ thick at base.

Gastral quadriradiates (d) exactly similar to the above mentioned triradiates, except in the presence of apical ray. Apical ray straight, sharply ended, much shorter and slightly thinner than facial rays, 55–65 μ long and 10–14 μ thick at base.

Oxea (e) elongate spindle-shaped, a little irregular in outline, curved in C-like manner, sharply pointed at the proximal end and provided with an indistinct lance-head at the distal end, 300–510 μ long and 35–50 μ thick in the thickest parts.

Remarks:—The above described new species bears a marked resemblance to *Grantia pennigera* Haeckel[1] and to *G. monstruosa* Breitfuss[2] in external appearance. But from the Haeckel's species, the present species may be easily distinguished by the differences in spiculations and canal system. The present species differs also from *G. monstruosa* in several points; viz. 1) the thickness of all kinds of spicules of the present species are thicker than those of the other; 2) the shapes of gastral radiates differ in these two species; and 3) the large oxea of this species are of only one kind, while those of *G. monstruosa* are of two kinds and their shapes and dimensions may be differentiated distinctly from those of this species. The most

1) *Grantia pennigera* (*Sycandra compressa* var. *pennigera*), HAECKEL, 1872, p. 362, Taf. 55, fig. 2.

2) *Grantia monstruosa*, BREITFUSS, 1898, pp. 24–26, Taf. II., fig. 16, Taf. III., fig. 19.

conspicuous feature of the present species exists in the structure of the gastral skeleton forming many bridge-like conjunctions.

The specific name is dedicated to Professor Tohru Uchida, the director of the Akkeshi Biological Station of the Hokkaido Imperial University.

Locality:—Akkeshi Bay in Hokkaido.

3. Leucandra cerebrum, n. sp.

(Textfig. 5, 6)

This new species is based upon a single specimen (Textfig. 5) which was secured from Akkeshi Bay. It forms a massive, irregular

Textfig. 5. *Leucandra cerebrum*, n. sp. ×1.5

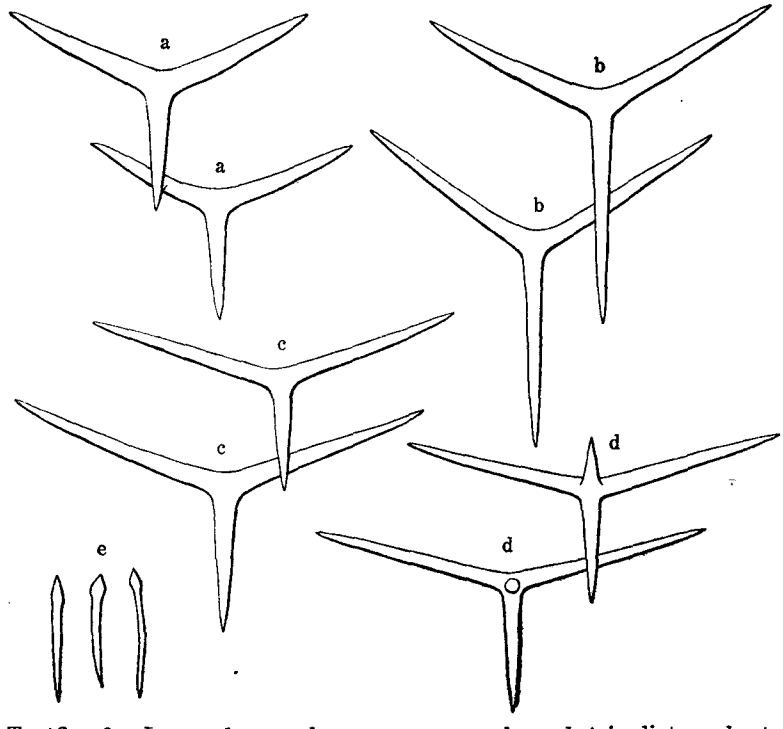
hemispherical body, with a deep groove in the center. The specimen measures about 45 mm in diameter and about 30 mm in height. The oscula, several in number, are naked and open on the outer surface of the sponge. The largest osculum is irregularly elliptical in outline with a maximum diameter of about 8 mm, while the smallest is slit-like with a length of 5 mm.

The greater part of the dermal surface is torn off, but the remaining perfect parts appear nearly smooth to the naked eye. The gastral cavity is relatively narrow and is branched in a very irregular manner. The surface of the gastral cavity is rather smooth but is perforated by many exhalant apertures.

The colour in alcohol is greyish white and the texture compact.

Structure:—The canal system is of the leuconoid type. The flagellate chambers are of spherical or oval shape, measuring 40–95 μ in diameter and are thickly packed in the chamber layer. The dermal skeleton is rather thin and is composed of triradiates which are tangentially but confusedly arranged in a few layers. Microxea cover the dermal surface fairly densely, standing at various angles to it.

The skeleton of the chamber layer consists of triradiates which are irregularly set together. The walls of the larger exhalant canals



Textfig. 6. *Leucandra cerebrum*, n. sp. a, dermal triradiates; b, tubar triradiates; c, gastral triradiates; d, gastral quadriradiates; e, dermal microxea. (a—d ×150; e ×240)

are lined with triradiates and quadriradiates with apical rays projecting into the canal.

The gastral skeleton is as thin as the dermal, but is fairly well distinguished from the chamber layer, and is made up of tri- and

quadriradiates, both being arranged tangentially in a few layers. The gastral quadriradiates are smaller in number than the triradiates of the same skeleton and their short apical rays are projected into the gastral cavity.

The oscular margin is composed of dermal and gastral spicules only, and there is not anly peculiarity to be mentioned of their shape and arrangement.

Spicules (Textfig. 6) :—Dermal triradiates (a) slightly sagittal and all rays equal in thickness. Basal ray straight, sharply pointed, shorter than paired rays, 70–120 μ long and 15–22 μ thick at base. Paired rays nearly equal, slightly curved forwards, 95–200 μ long and 15–22 μ thick at base.

Tubar triradiates (b) subregular or very slightly sagittal. Basal ray straight, either equal to or slightly longer than paired rays, 150–220 μ long and 12–15 μ thick at base. Paired rays equal, sharp ended, nearly straight, 135–210 μ long and 12–15 μ thick at base.

Triradiates and quadriradiates of the larger exhalant canals are exactly similar to those of the gastral which will be mentioned later.

Triradiates of the gastral surface (c) strongly sagittal. Basal raw straight, tapering to sharp end, shorter than paired rays, 95–145 μ long and 12–16 μ thick at base. Paired rays widely divergent and slightly curved forwards, 150–220 μ long and 12–16 μ thick at base.

Gastral quadriradiates (d) sagittal and similar to gastral triradiates except in the presence of apical ray. Apical ray straight, sharply pointed, shorter and slightly thinner than facial rays, 40–70 μ long and 8–10 μ thick at base.

Microxea of the dermal surface (e) straight or slightly curved, sharply pointed at both ends but provided with a lance head at the distal end, about 95 μ long and 4–6 μ thick in the thickest parts.

Remarks:—The present new species may belong to Section D of the genus *Leucandra* in the system of classification proposed by Dendy and Row[1], on account of the fact that it is charged with microxea but lacks large oxea. But it may be easily distinguished from the other members of the genus by the external features, by

1) Dendy A. and Row, W. H. Proc. Zool. Soc. London, 1913, p. 773.

the position of the microxea, and by the nature of spiculations.

This species is named after its external appearance, which resembles the brain of animals.

Locality:—Akkeshi Bay in Hokkaido.

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