

## A topographical approach to a study of the benthic communities on the submarine ridge, Sé-no-umi, in Sagami Bay\*

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(With 3 Text-figures)

In the case of land ecology, it seems to be obvious that topography exerts a more or less definite influence, through the edaphic character and the micro-climate of the habitat, on the distribution patterns of plants and animals. A keen observer may recognize such

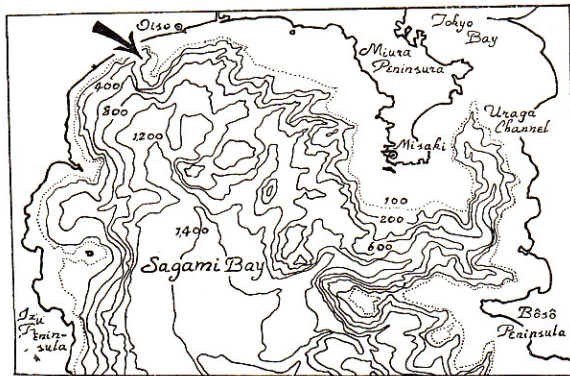


Fig. 1. Location of the submarine ridge, Sé-no-umi, off Oiso, in Sagami Bay.  
相模湾大磯沖“瀬ノ海”

on a chart, in which are drawn only a few isobath contours of unequal intervals, e. g. 5, 10, 20 and 200 metres. It would be very difficult to grasp the details of the topography from such a map. In this short article, an attempt has been made to visualize the distribution patterns of some characteristic benthic animals in relation to the submarine topography, showing not only a 50 m contour map but also a block diagram, on which the symbols of the benthic animals are plotted.

The surveys were made in July, 1956 and December, 1958, on board the research vessels, Shinyō-maru (Tokyo U. of Fisher.) and Enoshima-maru (Kanagawa Pref. Fisher. Exp. St.). The benthic animals together with the sediments and the remains of mollusks, bryozoans and others were collected by a Niino dredge. The surveyed area (fig. 1 & 2) is a submarine ridge, Sé-no-umi, extending from the margin of the shelf at the head of Sagami Bay, off Oiso in Kanagawa Prefecture. The ridge has a flat top at a depth of about 100 m. It slopes

a relation between topography and bio-communities at the start of his field survey. In marine ecology, the circumstances are somewhat different. An ecologist on board a ship sees nothing but the flat sea surface, and seldom obtains a vivid image of the topographical features of the area he is surveying without the aid of an echosounder and a detailed hydrographical chart. This seems to be reflected in the rather conventional way of giving the location of the sampling stations

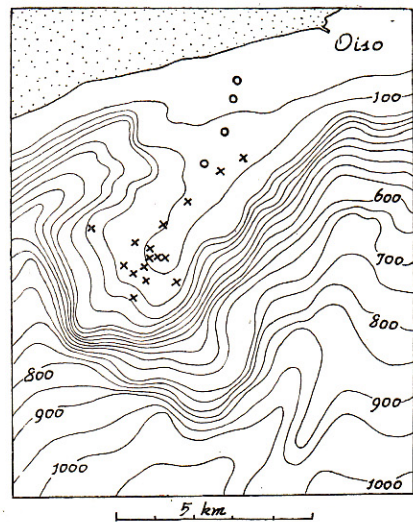


Fig. 2. Surveying stations on the submarine ridge, Sé-no-umi, in 1956 (x) and 1958 (O).  
“瀬ノ海”の海底地形と採泥点  
(x: 1956年, O: 1958年)

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off abruptly on the east side, while on the west side the inclination is rather gentle for some distance.

A block diagram (fig. 3) was drawn from a plan (fig. 2) which indicates isobath contours of 50 m intervals. The plan was prepared from a 100 m contour map and a hydrographical chart (no. 3001) made by the Japanese Hydrographic Office. The symbols of some forms, conspicuous for their numbers or large size, are plotted on the diagram.

It requires only a glance at the diagram to recognize that the flat top of the ridge is occupied by two species of bivalves, *Glycymeris rotunda* (DUNKER) and *Venus foveolata* SOWERBY. Either one or both of them were found at nearly all stations on the top, together with many specimens of polychaets. A fair number of both bivalves caught alive may imply that even the odd valves of the dead shells had not been transported from elsewhere. These two species are characteristic to the muddy bottom of the outer part of the shelf (lower shelf zone),\* and it is natural to find them on the top of the ridge where the sediments contain a large amount of fine particles. It is worthy of notice that the ridge is devoid of sandy sediment and its characteristic pelecypod mollusk, *Chlamys vesiculosa* (DUNKER). This would be related, as reported previously,\* to the weakness of the current at the head of Sagami Bay.

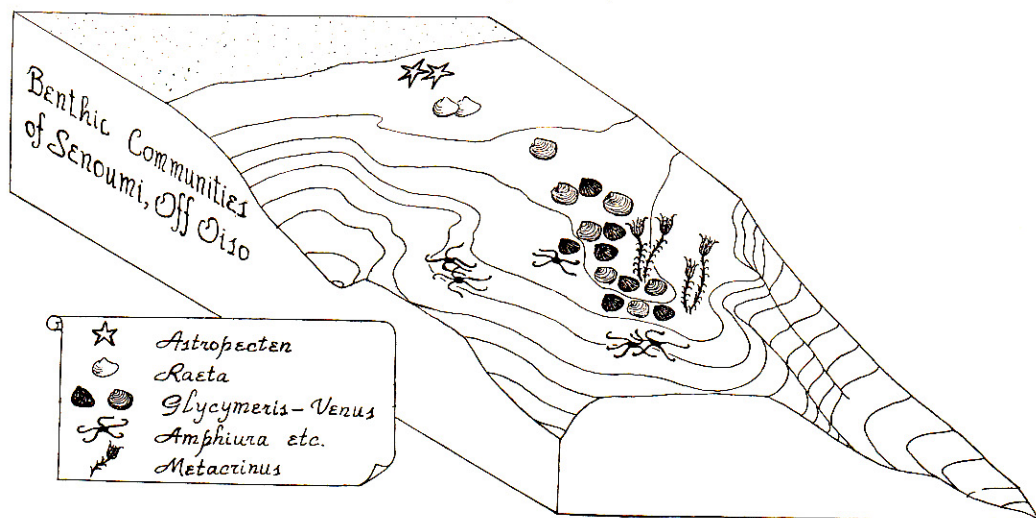


Fig. 3. Distribution of the conspicuous benthic animals on the submarine ridge, Sé-no-umi, off Oiso.  
 “瀬ノ海”における顕著な底棲動物の分布

Several ophiuroideans were found on the slope around the habitat of the bivalves. In Uruga Channel, another region of Sagami Bay (fig. 1), this group of animals also tend to be distributed along the continental slope (unpublished). A crinoid, *Metacrinus rotundus* CARPENTER, were found exclusively at two stations on the tip of the ridge. Although only a single specimen of the sea-lily was collected at each station, fragments of the stem were also found in the sediment at both stations, and were absent from any others. The occurrence of the species might indicate some environmental difference at this exposed locality. In connection to this, it is interesting to note that specimens of another stalkless crinoid, *Comanthus japonica* (J. MÜLLER), are found attached at the very tip of the jetty at Misaki Marine Biological Station when they are liberated after

\* Horikoshi; M. 1957 Note on the molluscan fauna of Sagami Bay and its adjacent waters: Sci. Rep. Yokohama Nat. U., Sec. 2 (6): 37-64, pl. 11, 2 charts, 13 fts.



experimentation. These sedentary forms seem to require habitats where steady water currents will bring them a constant supply of plankton.

Entirely different assemblages of benthic animals were found in the inshore area. From the fine sandy bottom at 20 m, several specimens of an asteroid, *Astropecten scoparius* VALENCIENNES, a common species also found in the inter-tidal zone, were collected. Some mollusks such as *Raeta pulchella* (ADAMS & REEVE), *Placamen* (= *Chione*) *tiala* (DILLWYN) and *Inquisitor jeffreysii chocolata* (A. ADAMS), shells of which are often found on the beach, were taken from the muddy sand a little deeper (38 m). A few dead shells of young *V. foveolata* were obtained at a depth of 65 m, just outside the boundary between the upper and lower shelf zone in this part of Sagami Bay.

In conclusion the writer wishes to express his thanks to Dr. J. C. Dan, of Ochanomizu University, for reading the manuscript.

## 抄 録

### 大磯沖“瀬ノ海”の底棲動物群：

#### 海底地形と底棲動物の分布

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神奈川県大磯沖にある半島状に突き出て頂部が平坦な“瀬ノ海”と呼ばれる水深100mの陸棚延長部で、1956年7月（神鷹丸・水産大）及び1958年12月（江ノ島丸・神奈川県水試）に調査を行った。新野式ドレッジにより得た堆積物中より底棲動物と遺骸とを拾い出したが、いま顕著な動物（多数を占めるか或は大型な）の存在を、図上に示せば、その分布と海底地形との間には関聯があるのが見られる。

平坦な頂部の泥底は陸棚外半部（下部陸棚帯）の泥質底に多い二枚貝ベニグリ (*Glycymeris rotunda*)、ビノスモドキ (*Venus foveolata*) によって占められている。これより少々深い斜面には浦賀水道等でも陸棚崖に分布する蛇尾類が多く見られる。海百合の1種トリノアン (*Metacrinus rotundus*) が平坦突出部の先端2地点のみで得られた事はこの露出した地区が多少とも潮通しの良い事を示すものであろう。陸岸に近い砂底 (20m) 及び泥質砂底 (38m) では得られた動物も遺骸も、平坦部のものとは異り上部陸棚帯に属するもので、潮間帯にもいるモミジヒトデ (*Astropecten scoparius*)、及び海浜に屢々打上げられるチヨノハナガイ (*Raeta pulchella*)、ハナガイ (*Placamen tiara*)、チャイロモミジボラ (*Inquisitor jeffreysii chocolata*) 等が得られた。ビノスモドキ幼貝の合弁の死殻数個を見た近隣地点 (65m) との間には上下陸棚帯の境界があると思われる。下部陸棚帯にヒヨクガイが見られないのはこの地域が相模湾奥に当り、湾口部に比べて海流が弱く砂質底を欠くためと考えられる。

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