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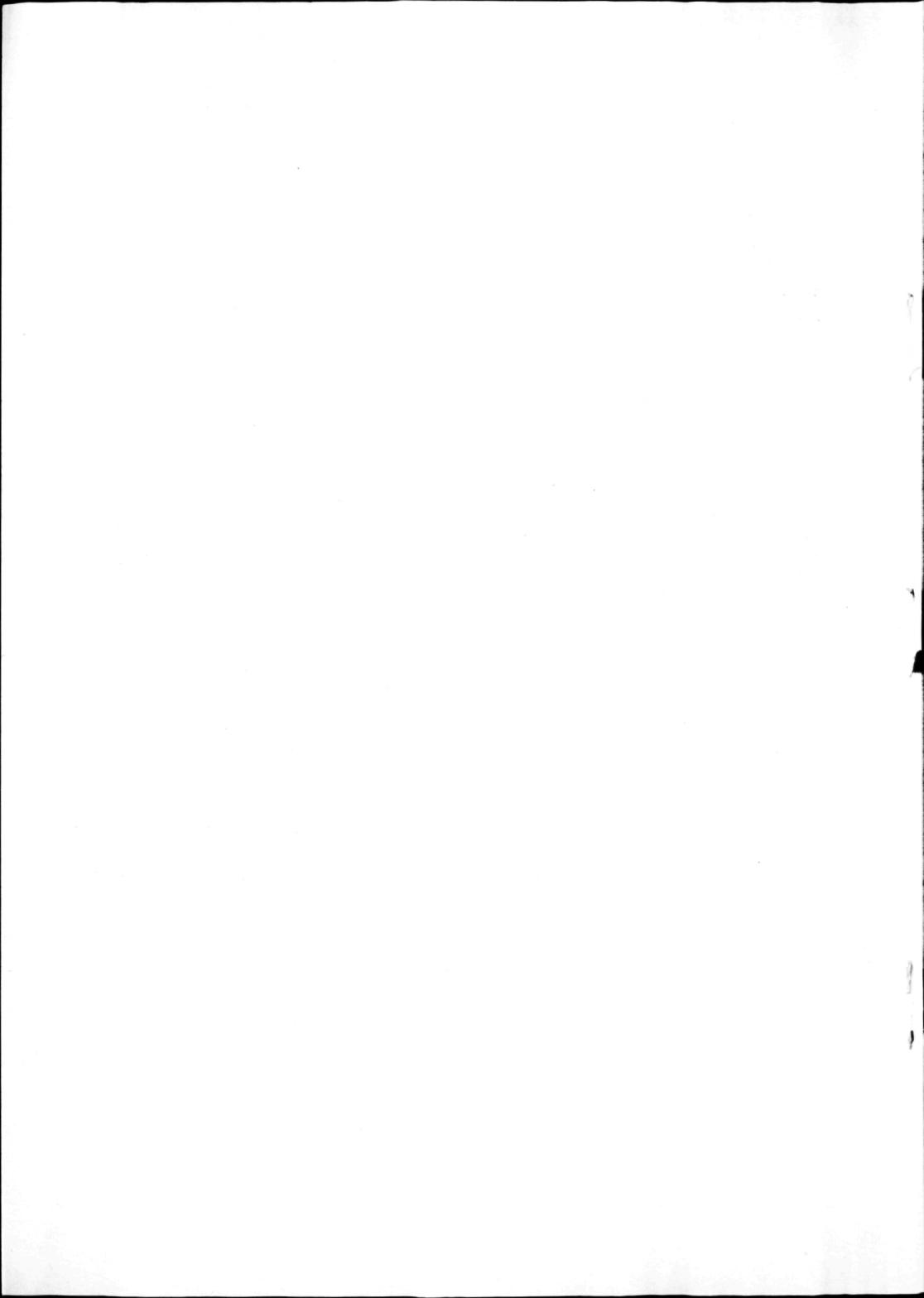
A Quantitative 3-Year-Survey on the Meiofauna of  
Known Macrofauna Communities in the Öresund

(Abstract)

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## A Quantitative 3-Year-Survey on the Meiofauna of Known Macrofauna Communities in the Öresund

(Abstract)

By Kirsten Muus

At the Elsinore laboratory we are at present engaged in a quantitative investigation of the meiofauna in the northern part of the Öresund. The idea is to register the quantitative changes in the meiofauna throughout the different seasons. We hope — among other things — to find a relation between the number of macrofauna-larvae present in the plankton and the number of settling specimens. We also want to find the rates of growth and mortality of these newly-settled specimens.

Two localities in the Sound have been chosen rather close to each other but with different substratum and therefore different faunal composition. Both localities are situated on a level and rather homogeneous bottom. Only one of the localities is mentioned here. It has a substratum of fine sand and the depth is 18 m. The dominating animals in the macrofauna are the lamellibranchs *Mysella bidentata* and *Venus gallina*, the polychaetes *Nephtys hombergi* and *Scoloplos armiger*, and the echinoderms *Ophiura albida* and *Echinocardium cordatum*.

The main part of the investigation is a regular bottom-sampling with the "mouse-trap" an apparatus specially constructed for the collection of meiofauna (B. J. Muus 1964).

Simultaneously with this sampling, quantitative plankton investigations combined with hydrographic measurements have been carried out in the same area. Also the macrofauna has been collected, partly quantitatively with the Smith-McIntyre grab, partly by dredging.

Each meiofauna sample represents 190 cm<sup>2</sup> of the bottom and the digging depth is 2 cm. According to McINTYRE (1961) by far the majority of the meiofauna is found in the upper two centimeters of the substratum.

The sample is brought up enclosed in a nylon bag with a mesh-size of 265  $\mu$ . Each fortnight five samples are taken on the same spot — to the best of our navigational means. The sampling has been carried out 1963—65, and during this period we have found the bottom-sampler both reliable and efficient. Luckily the substratum is so fine grained that most of it disappears through the nylon-net. In the beginning several methods for separating the animals from the substratum were tried, but none of them proved to be really efficient so now the samples are sorted in small fractions under a microscope.

The investigation is just finished, and the material is still far from being fully worked up.

The identification of meiofauna animals still presents problems, especially among the groups permanently belonging to the meiofauna such as nematodes and harpacticoids. The younger stages of macrofauna members such as polychaetes, gastropods, lamellibranchs and echinoderms can be identified rather easily.

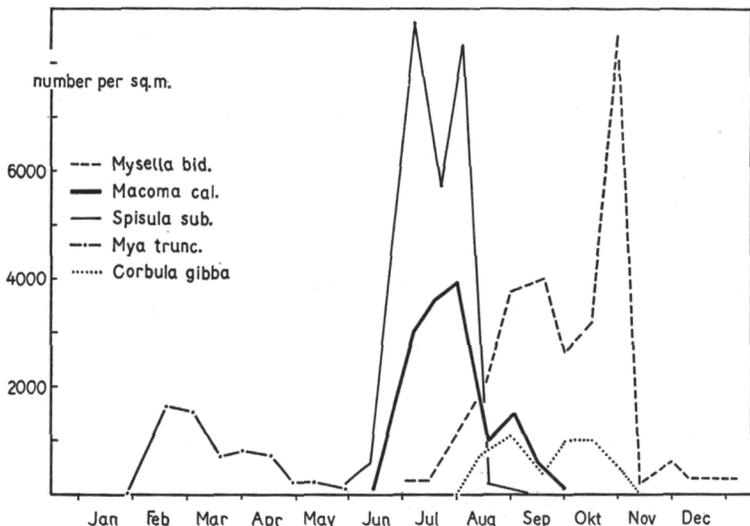


Fig. 1: Number per sq.m. of newly-settled lamellibranchs. Northern part of the Öresund.

In spite of the preliminary and incomplete treatment of the material we have already found some of the characteristics we hoped. For instance we have had affirmed our suspicion that great numbers of newly-settled bottom stages representing various animal groups occur at different seasons of the year, persist for a short period and then disappear almost completely. This phenomenon would of course never have been disclosed by the conventional way of sampling, using 1 mm mesh-size and sampling at long intervals.

Fig. 1 shows the number per sq.m. of some lamellibranchs throughout the year. Each dot on the curve represents the average number in five samples from the same day. The most conspicuous figures are those of *Spisula subtruncata*. Except during the summer it occurs in a very small number at the locality, usually only a few per sq.m. In the summer of 1965 however, we had a great spatfall in June-July — up to eight thousand per sq.m. Already in the middle of August their number was reduced to less than 100 per

sq.m. and in the beginning of September they were totally absent from the samples. The same happens to other lamellibranch species: the winter-spawner *Mya truncata*, *Macoma calcarea*, *Mysella bidentata* and *Corbula gibba*.

Fig. 2 shows that the same phenomenon applies to species from other groups i. e. the polychaete *Pectinaria koreni*, the gastropod *Philine denticulata* and the brittle star *Amphiura filiformis*.

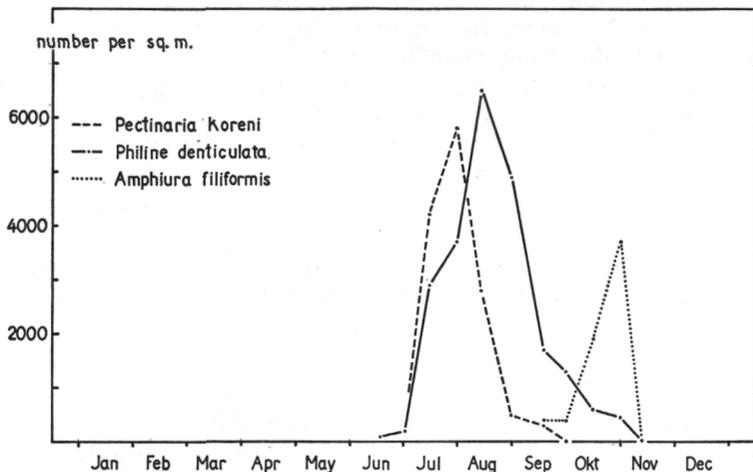


Fig. 2: Number per sq.m. of newly-settled specimens from different groups. Northern part of the Öresund.

If we want to draw some conclusion from these and other preliminary results, it would be, that vast numbers of planktonic larvae will settle on a substratum where they do not belong. That is so for instance for *Amphiura filiformis* who is never found in any size bigger than one millimeter on this locality.

Another conclusion would be that if we want the quantitative facts about the meiofauna we must do the sampling very frequently. A longer interval than one month between the sampling dates is not adequate and a fortnight would be preferable at least in the summer and autumn.

#### References

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## Discussion

BOADEN: How deep does your dredge dig? Could the sudden decrease in numbers of young lamellibranchs be due to the animals burrowing as they become larger, or is this effect due mainly to predation?

MUUS: The digging depth is 2 cm. The lamellibranchs do only reach a size of about 1—1,5 mm before their disappearance, so the eventual burrowing must be unimportant. The amount consumed by several of the local predators has been shown to be big enough to account for the disappearance of the young lamellibranchs.

MØLLER-CHRISTENSEN: We know that the disappearance of many newly settled lamellibranchs is due to predation. *Astropecten irregularis*, for example, will swallow and digest more than 100 *Spisula subtruncata* per day during the month of July.

THIEL: How many samples do you take at the same time and how large is the variation between different samples from the same place?

MUUS: We take five samples at the same time. The variation is surprisingly small. An example is given in B. J. Muus (1964), table 1—2.

GRAY: Is it possible that some of the larvae are only transitory settlers like *Mytilus* larvae which settle on algae before finally settling on another substrate.

MUUS: The possibility can not be excluded. All the five lamellibranch species mentioned can reach the adult stage at the locality. The most likely to migrate after the metamorphosis is *Mya truncata*. Of the other three species *Pectinaria koreni* and *Philine denticulata* actually belong to the fauna of the area. *Amphiura filiformis* does not belong, and it is not known whether its disappearance partly might be due to migration.



