

Deep-Sea Newsletter, 19, 20-22, 1992

## THE ANTARCTIC DEEP-SEA HEXACTINELLID FAUNA

An often mentioned characteristic of the Antarctic benthos is the exorbitant occurrence of hexactinellid sponges all around the continent (Topsent 1912, Koltun 1970). To be precise, this dominance is found only on the shelf, and it is due to a high abundance of large-sized specimens of between 2 and 6 species - the number accepted depending on each author's ideas on synonymy (Burton 1929, Koltun 1976, Barthel & Tendal in prep.).

There are only two records of hexactinellids from the slope, and it can be questioned if there is a special bathyal sponge fauna at all in the Antarctic (Barthel & Tendal 1989).

At present, the Antarctic abyssal hexactinellid fauna comprises 23 recognized species (Table 1) taken at few localities, which are unevenly spread around only half of the continent (Fig. 1). These species all belong to families and - with the exception of two - to genera widely distributed at abyssal depths in the three large oceans (Lévi 1964).

Of the 23 species, 18 have only been found in the Antarctic region; this high "endemism" is, however, misleading, as 16 species (about 70 %) have only been found once, and another 5 only two or three times. The situation is typical for the deep-sea hexactinellid fauna worldwide, as 115 (76%) of the about 150 species known from depths greater than 2000 m have been found only once (Lévi 1964, Tendal unpublished).

Five species have been recorded in other oceans as well, i.e. one worldwide but not abyssally, two in the Atlantic, one in the Atlantic and the Pacific, and one in the Pacific and Indian Oceans; thus, the basis for conclusions on faunal relationships is too small.

The poor knowledge of the Antarctic deep-sea hexactinellids is further thrown into relief by the fact that 12 species are known only as fragments, a situation impeding even the simplest conclusions on biological features. For some species it is known, and for others it can be deduced from the (most often scantily) known congeners that 13 species probably are soft-bottom inhabitants, 5 may live on hard substrates, and for 5 nothing can be said. So the pack ice area that influences the distribution pattern of species of many other classes by delivering dropstones that can serve as substrates (Picken 1985), does not seem to be a decisive factor in hexactinellid distribution (Picken 1985).

The picture of the taxonomic composition of the Antarctic deep-sea hexactinellid fauna is very incomplete, and nothing is known about distribution

patterns, fauna relationships and general biology. We would therefore like ourselves to work up pertinent existing collections, as well as to take part in the planning of programs, projects and cruises that might provide relevant material. Being both the only topographic link between the large deep-sea regions of the world oceans and also the region where most of the globe's deep-water is produced, the ocean around the Antarctic continent houses a fauna that can provide the answers to a number of questions concerning present and past evolutionary, biological and biogeographical events.

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Fig.1. Localities in Antarctica at depths larger than 2000 m from where hexactinellids have been reported.

▲ = localities within the pack ice limit. ▼ = localities outside the pack ice limit, but close to the Antarctic convergence.

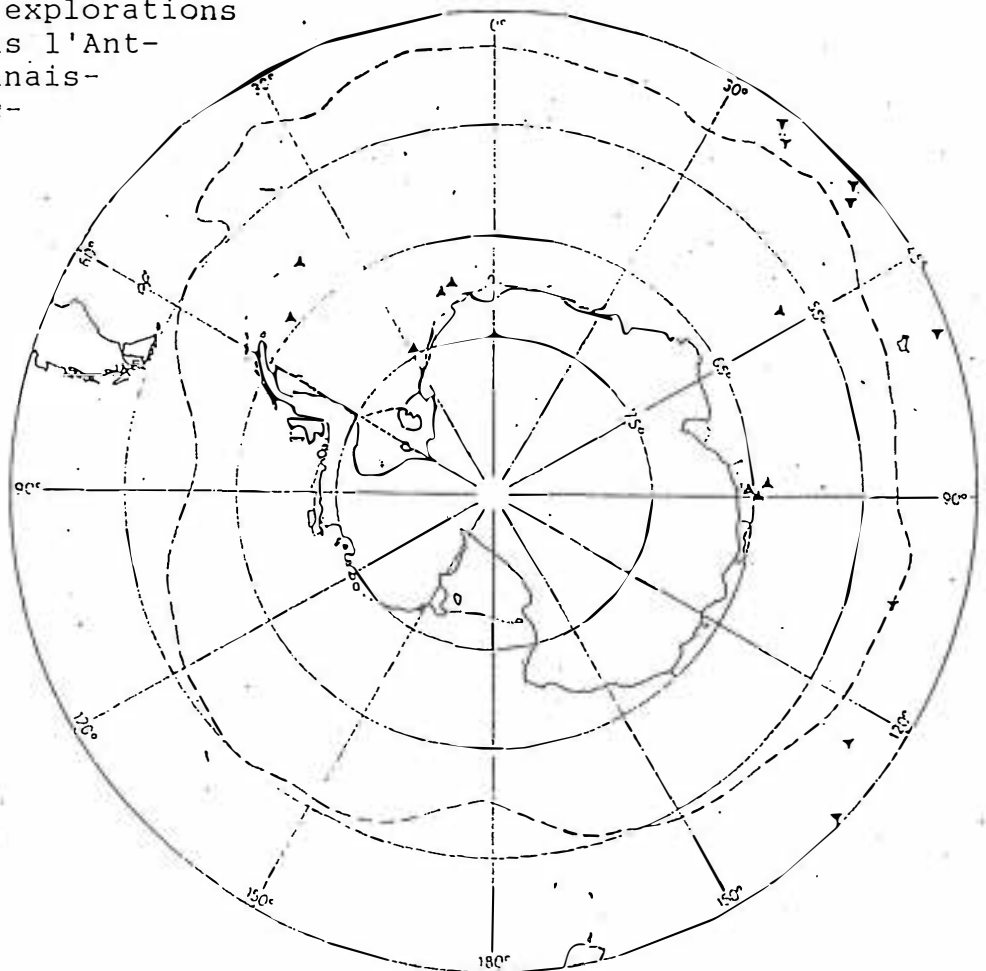


Table 1. The species of hexactinellid sponges known from the Antarctic deep-sea region and adjacent areas, and the corresponding bathymetric range.

\*: occurs largely within the Antarctic convergence zone.  
 +: occurs only in ("endemic" to) the Antarctic deep sea.  
 (:): number of records outside the Antarctic deep sea and adjacent areas;  
 #: taken many times.

| SPECIES   | RECORDS   |      |           |
|---|---|------|-----------|
|   | Geographical area   | No   | Range (m) |
| <i>Hyalonema clavigera</i><br>Schulze, 1886                     | Crozet Isls   | 1    | 2928      |
| <i>H. conus</i> Schulze, 1886                                   | S. of Australia   | 1    | 3300      |
| <i>H. drygalskii</i> Schulze &<br>Kirkpatrick, 1910*+           | Wilhelm II Land   | 1    | 2795      |
| <i>Farrea occa</i> Bowerbank, 1862*                             | Bellingshausen Sea,<br>E. Weddell Sea                       | 2(#) | 450-2000  |
| <i>Chonelasma lamella</i><br>Schulze, 1886*                     | E. Weddell Sea,<br>Wilhelm II Land,<br>Crozet Isls          | 7(2) | 430-3397  |
| <i>Bathyxiphus</i> sp. Schulze &<br>Kirkpatrick 1910*           | Wilhelm II Land   | 2(1) | 2450-3397 |
| <i>Aulocalyx irregularis</i><br>Schulze, 1886*                  | Wilhelm II Land,<br>Marion-Crozet Isls,<br>Pr. Edwards Isl. | 3    | 567-3397  |
| <i>Holascus fibulatus</i><br>Schulze, 1886                      | S of Australia,<br>N of Kerguelen Isl.                      | 2    | 2516-4758 |
| <i>H. obesus</i> Schulze, 1904*+                                | Enderby Land  | 1    | 4636      |
| <i>H. polajevii</i> Schulze, 1886                               | S of Australia  | 1    | 2928      |
| <i>H. tenuis</i> Schulze, 1904 *+                               | Enderby Land  | 1    | 4636      |
| <i>Malacosaccus coatsi</i><br>Topsent, 1910*+                   | E Weddell Sea   | 1    | 2580      |
| <i>M. pedunculatus</i><br>Topsent, 1910*+                       | E Weddell Sea   | 1    | 2580      |
| <i>M. vastus</i> Schulze, 1886                                  | N of Kerguelen Isl.   | 1    | 2543      |
| <i>Acoelocalyx brucei</i><br>Topsent, 1910*+                    | C Weddell Sea   | 1    | 4547      |
| <i>Docosaccus ancoratus</i><br>Topsent, 1910*+                  | C Weddell Sea   | 1    | 4547      |
| <i>Caulophacus antarcticus</i> Schulze<br>& Kirkpatrick, 1910*+ | Wilhelm II Land   | 1    | 2450-3397 |
| <i>C. instabilis</i> Topsent, 1910*+                            | S. Orkney Isls  | 1    | 3248      |
| <i>C. pipetta</i> (Schulze, 1886)                               | SW of Australia   | 1    | 3566      |
| <i>C. scotiae</i> Topsent, 1910*+                               | E Weddell Sea   | 1    | 2580      |
| <i>C. valdiviae</i> Schulze, 1904*+                             | ? Bellingshausen Sea,<br>Enderby Land                       | 2    | 450-4636  |
| <i>Bathydorus spinosus</i><br>Schulze, 1886*                    | Bellingshausen Sea,<br>E Weddell Sea,<br>Crozet Isls        | 5(3) | 569-4847  |
| <i>Calycosoma validum</i><br>Schulze, 1899*                     | Near South Orkney   | 1(1) | 3266      |