

Modiolus modiolus beds

The horse mussel *Modiolus modiolus* (L., 1758) occurs in small patches or forms extensive beds with large densities in sublittoral hard bottom habitats, where it attaches to the hard substrate by the byssus threads. The horse mussels can grow to a shell length of more than 200 mm (Wiborg 1946), and can reach an age of up to 48 years (Anwar *et al.* 1990). *Modiolus modiolus* beds can be considered rather stable habitats, taking into account the adult size, the immobility and the longevity of the species.

Large aggregations of the horse mussels may in cause of time change the original substrate considerably, as increased biodeposition due to faeces, pseudofaeces, byssus, shell debris from dead horse mussels and accretion of silt and detritus adds to the existing hard bottom substrate (Dinesen 1999).

The two main investigations from the Faroes on *Modiolus modiolus* beds and their associated fauna are by Spärck (1929) early in this century and later by G. Dinesen, Zoological Museum, Copenhagen, as part of the BIOFAR program in 1988-1991 (Dinesen 1996). A minor investigation was briefly reported on by Zapstsepín and Rittkh (1977). They all found *M. modiolus* to be widely distributed within the Faroese area, Figure 1, with beds both on open coasts and in the fjords and sounds between the islands.

The horse mussel beds occur over widely different depths from the lower shore inside the fjords to approximately 210 m depth on the Faroe plateau (Dinesen 1999). In the Faroes, horse mussels from the fjords grow considerably larger, up to 150 mm, than horse mussels from the plateau that as a maximum reach a shell length of 120 mm (Dinesen 1999). Spärck often found a density of as many as 50 mussels per m², however, Dinesen recorded 220 *Modiolus* per m² on BIOFAR Stn. 662 (Nørrevang *et al.* 1994), probably the highest density ever recorded (Dinesen 1999).

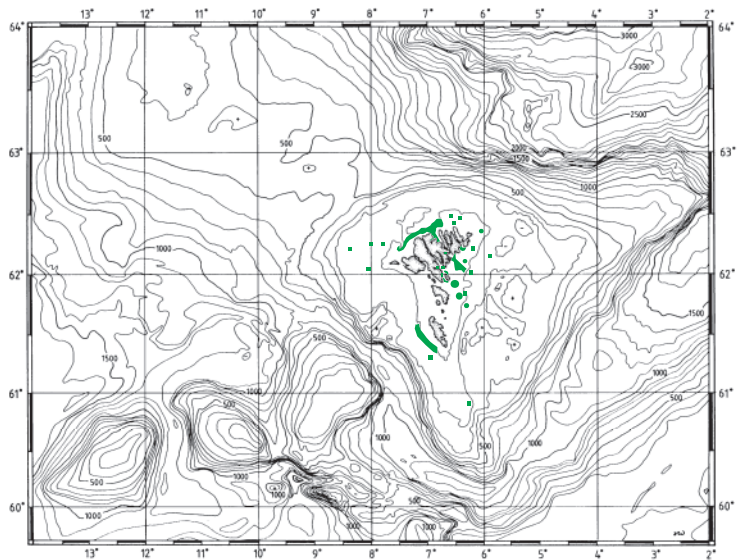


Figure 1.

A map of the Faroes with the occurrence of *Modiolus modiolus* indicated (based on Spärck (1929) and Dinesen/BIOFAR database).

The *Modiolus* association consists of the horse mussels with fauna attached to the valves, fauna living within the sediment between the horse mussels, and motile fauna moving about the horse mussels in search for food. Spärck (1929) listed 26 different taxa of invertebrates (including *M. modiolus*) from the beds (Table 1). During the BIOFAR program Dinesen investigated both sessile and motile epifauna of *M. modiolus* within the Faroe Islands and the surrounding waters. She identified 143 species among a total of 175 taxa of metazoan invertebrates. She found the same species as listed by Spärck apart from one, the cirripedia *Chirona hameri*. A short summary has been published (Dinesen 1999).

Spärck suggested a strong dependence on hydrographical conditions and in particular a constant and effective water renewal to be the main factors influencing the distribution of *Modiolus* beds as he found the weight of the epifauna to be large (17 kg per m²).

The *Modiolus* beds and their association are important because of their extension and from a fisheries point of view. The fauna associated to the *Modiolus* beds contains a number of organisms that are eaten

Table 1.

Invertebrates commonly living among *M. modiolus* (Spärck, 1929).

Nemertes	Nemertes indet.
Polychaeta	Polychaeta indet. Polyonidae indet. <i>Harmothoe imbricata</i> (L., 1767) <i>Lepidonotus squamatus</i> (L., 1758) <i>Pherusa plumosa</i> (O.F. Müller, 1776)
Mollusca	Polyplachophora indet. Gastropoda indet. Bivalvia indet.
Crustacea	Crustacea indet.
Decapoda	<i>Galatea nexa</i> Embleton, 1835 <i>Eualus pusiola</i> (Krøyer, 1841) <i>Eupagurus</i> sp. <i>Hyas coarctatus</i> Leach, 1815
Echinodermata	Echinodermata indet. <i>Henricia</i> cf. <i>sanguinolenta</i> (O.F. Müller, 1776) <i>Ophiopholis aculeata</i> (L., 1767) <i>Ophiotrix fragilis</i> (Abildgaard, 1789) <i>Strongylocentrotus droebachiensis</i> (O.F. Müller, 1776)
Ascidiacea	Ascidiacea indet.

Table 2.

Invertebrates commonly living on *M. modiolus* (Spärck 1929).

Porifera	Porifera indet.
Hydrozoa	Hydrozoa indet. <i>Hydrallmannia falcata</i> (L., 1758)
Cirripedia	<i>Chirona hameri</i> (Ascanius, 1767)
Bryozoa	Bryozoa indet.

by the cod, especially *Galatea nexa* and *Ophiopholis aculeata*. *Hyas* sp. and the annelids are also of importance.

Modiolus beds are also known from other regions in the North East Atlantic; Sweden (Petersen 1918, Gislén 1930), Iceland (Spärck 1937, Einarsson 1941), Norway (Wiborg 1946), Denmark (Thorson 1950), Isle of Man (Bruce *et al.* 1963), England

(Warwick & Davies 1977), North Ireland (Brown & Seed 1977), Scotland (Comely 1978). The resulting number of identified associated taxa and species from these investigations vary as different collecting gear have been used, and also different levels of determination have been reached. However, all the investigations show that there is a rich fauna associated to the *Modiola* beds in the North East Atlantic.

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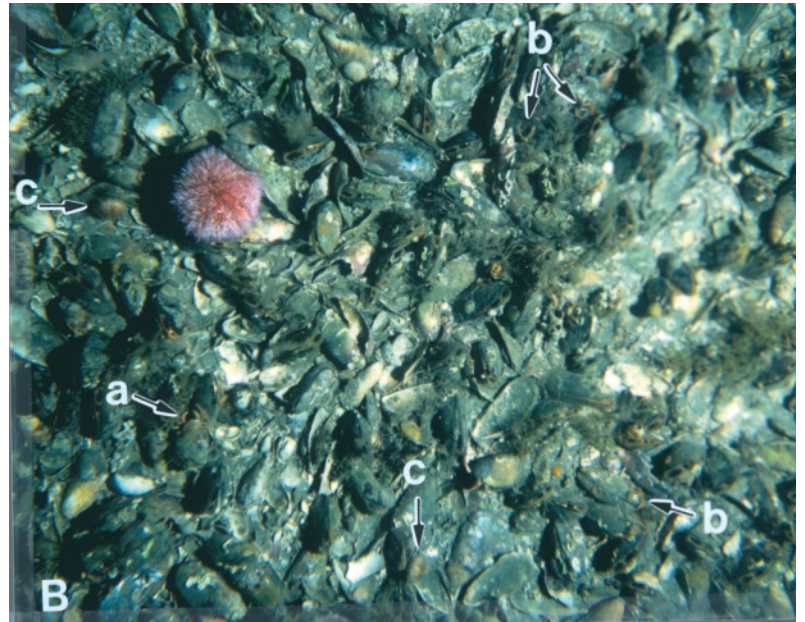


Figure 2.

The under-water photograph shows a section of a *M. modiolus* bed from the Faroe plateau at a depth of 77 m (BIOFAR stn. 662; Nørrevang *et al.* 1994). The pink sea urchin is *Echinus esculentus* L., 1758, a. *Hyas coarctatus* Leach, 1815, b. *Galatheidae*, probably *Galatea nexa* Embleton, 1835, c. *Strongylocentrotus* spp. The photo covers 0.87 m² (© photo J. Gutt, Alfred-Wegener-Institut, Bremerhaven).

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