

The bivalve molluscs of Varangerfjorden, northern Norway

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Backeljau, T., De Meyer, M., Janssens, L., Liesse, H. & Proesmans, R. 1986. The bivalve molluscs of Varangerfjorden, northern Norway. *Fauna norv.*, Ser. A 7, 1—9.

A preliminary account of the Bivalvia of Varangerfjorden is presented. It has been compiled from a literature survey and recent collections made by the authors. In total 65 species are reported, six of which were not previously mentioned from the Varanger district. They are: *Altenaeum dawsoni*, *Myssella bidentata*, *Montacuta substriata*, *Cerastoderma edule*, *Acanthocardia echinata* and *Mya pseudoarenaria*.

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INTRODUCTION

Since Norman (1902) published his account of the molluscs of East Finnmark, very few new data on the malacofauna of Varangerfjorden have been reported. Therefore we described in a previous paper the gastropod fauna of Store Ekkerøy (Backeljau et al. 1984a). In the present study we give a preliminary account of the bivalves of the Varangerfjord.

For convenience we consider the degree of longitude of 31° E. as the eastern limit of the Varanger district (Fig. 1). Thus the village of Kiberg still belongs to the investigated area, whereas Vardø does not.

The data in this paper have been compiled from the literature (see references) and from material collected by the authors. The nomenclature is somewhat modified after Nordsieck (1969), Bernard (1979b), Lubinsky (1980) and Scarlato (1981). The material collected by the authors is kept at the «Laboratorium voor Algemene Dierkunde, Rijksuniversitair Centrum Antwerpen». Later it will be deposited in the collections of the «Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussel». In the text it will be mentioned under the heading «RUCA-coll.».

SYSTEMATIC ACCOUNT

Nucula delphinodonta Mighels & Adams, 1842

Literature: Vadsø (G.O. Sars 1878). RUCA-coll.: ⁻¹⁾

¹⁾ - = not present in the RUCA-collections.

Nucula tenuis (Montagu, 1808)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), «abundant throughout the district» (Norman 1902). RUCA-coll.: -

Nuculana minuta (Müller, 1776)

Literature: Elvenes (De Guerne 1886), «throughout the district» (Norman 1902). RUCA-coll.: Store Ekkerøy. *Remarks:* This species may be confused with the next one. The differences between the two are well outlined by Bernard (1979b).

Nuculana pernula (Müller, 1779)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), «throughout the district» (Norman 1902). RUCA-coll.: Varangerbotn.

Portlandia lucida (Lovén, 1846)

Literature: Vadsø (G.O. Sars 1878), Varanger- and Langfjord (Norman 1902). RUCA-coll.: -

Portlandia intermedia (M. Sars, 1865)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Varanger-, Bøk- and Langfjord (Norman 1902). RUCA-coll.: - *Remarks:* Bernard (1979b) suggested that this species may be a variety of *Portlandia lucida*.

Portlandia lenticula (Møller, 1842)

Literature: Varanger-, Bøk- and Langfjord (Norman 1902). RUCA-coll.: -

Portlandia frigida (Torell, 1859)

Literature: Vadsø (G.O. Sars 1878), «in all the fjords» (Norman 1902). RUCA-coll.: -

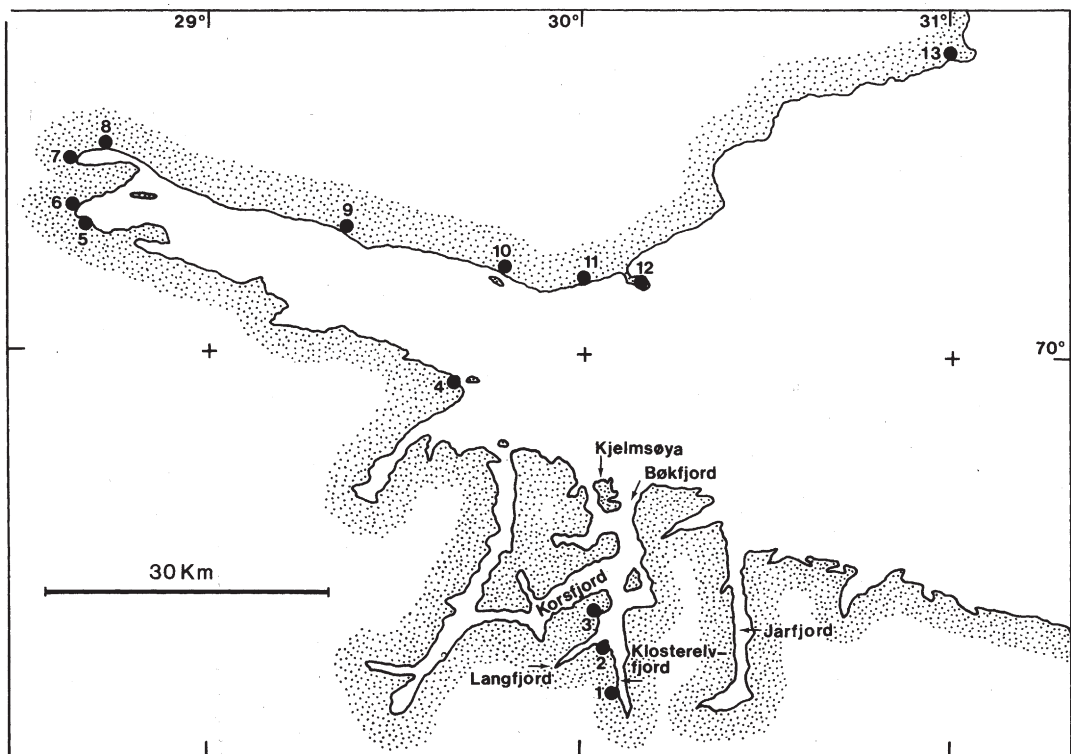


Fig. 1. Map of the Varangerfjord. 1. Elvenes. 2. Kirkenes. 3. Leirpollen. 4. Bugøynes. 5. Sivertbukt. 6. Karlebotn. 7. Varangerbotn. 8. Meskelv. 9. Vestre Jakobselv. 10. Vadsø. 11. Saltjern. 12. Store Ekkerøya. 13. Kiberg.

Bathyarca glacialis (Gray, 1824)

Literature: Elvenes (De Guerne 1886). RUCA-coll.: Store Ekkerøy. *Remarks:* The taxonomic relationships between this species, *B. pectunculoides* (Scacchi, 1834) and *B. raridentata* (Wood, 1840) need to be clarified.

Dacrydium vitreum (Møller, 1842)

Literature: Vadsø (G.O. Sars 1878), Varanger-, Bøk- and Langfjord (Norman 1902). RUCA-coll.: Store Ekkerøy.

Crenella decussata (Montagu, 1808)

Literature: Elvenes (De Guerne 1886), Vadsø and all Sør-Varanger fjords (Norman 1902). RUCA-coll.: Store Ekkerøy. *Remarks:* Scarlato (1981) places this species in a separate family Crenellidae, but others authors consider it as to belong to the Mytilidae. We follow the latter opinion.

Modiolus modiolus (Linnaeus, 1758)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Lang- and Klosterelv-fjord (Norman

1902), Kjelmsøy (Dons 1937). RUCA-coll.: Vestre Jakobselv, Vadsø, Store Ekkerøy.

Modiolus phaseolinus (Philippi, 1844)

Literature: Vadsø (G.O. Sars 1878), Vadsø and Langfjord (Norman 1902), «Varangerfjord» (Jensen 1912). RUCA-coll.: Vestre Jakobselv, Store Ekkerøy. *Remarks:* The differences between *M. phaseolinus* and juveniles of *M. modiolus* are very well outlined by Jensen (1912) and Tebble (1976).

Musculus discors (Linnaeus, 1767) s.l.

Literature: forma *typica*: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Vadsø (Norman 1902); forma *laevigata* (Gray, 1824): Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Bøk- and Langfjord (Norman 1902). RUCA-coll.: forma *typica*: Store Ekkerøy; forma *laevigata*: Vestre Jakobselv, Vadsø, Saltjern, Store Ekkerøy; forma *substriata* (Gray, 1824): Store Ekkerøy.

Remarks: The taxonomic rank of the varieties of *M. discors* is still much debated. As our material

from Store Ekkerøy and Saltjern is extremely variable with respect to shell form and sculpture, and as transitional types between the three varieties were observed, we do not follow Nordsieck (1969) and Scarlato (1981) in considering *M. laevigatus* as a distinct species. Our material, however, does not enable us to present decisive arguments. This problem is further discussed by Jensen (1912), Madsen (1949), Ockelmann (1958), Abbott (1974), Bernard (1979b) and Lubinsky (1980).

Musculus niger (Gray, 1824)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), «in all the fjords» (Norman 1902). RUCA-coll.: -

Musculus corrugatus (Stimpson, 1851)

Literature: Vadsø (G.O. Sars 1878), Langfjord (Norman 1902). RUCA-coll.: -

Remarks: The differences between this species and *M. discors* s.l. are outlined by Jensen (1912), Lubinsky (1980) and Scarlato (1981). Bernard (1979b) doubts whether the species actually occurs in the Atlantic segment of the Arctic.

Mytilus edulis Linnaeus, 1758

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), «in several places» (Norman 1902). RUCA-coll.: Vadsø, Store Ekkerøy.

Palliolium imbrifer (Lovén, 1846)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886). RUCA-coll.: - *Remarks:* The nomenclature of the Pectinidae is still very confused. We follow here arbitrarily Abbott (1974) and Bernard (1979b).

Palliolium tigrinum (Müller, 1776)

Literature: Langfjord (Norman 1902). RUCA-coll.: -

Arctinula greenlandica (Sowerby, 1842)

Literature: Vadsø and Varangerfjord (G.O. Sars 1878), Elvenes (De Guerne 1886), Varanger- and Bøkfjord (Norman 1902). RUCA-coll.: Store Ekkerøy (?).

Remarks: The correct original spelling of this name is «greenlandicus» and not «groenlandicus» as it has been emended by subsequent authors (see Bernard 1979b). The taxonomic relationships between *Arctinula* Thiele, 1935, *Delectopecten* Steward, 1930, *Palliolium* Monterosato, 1884 and *Cylopecten* Verrill, 1897, need to be revised.

Chlamys septemradiata (Müller, 1776)

Literature: Vadsø (G.O. Sars 1878), Varangerfjord (Jensen 1912, Madsen 1949). RUCA-coll.: -

Chlamys islandica (Müller, 1776)

Literature: Vadsø and the whole Finnmark coast (G.O. Sars 1878), Elvenes (De Guerne 1886), Va-

ranger- and Klosterelvford (Norman 1902). RUCA-coll.: Varangerbotn, Store Ekkerøy.

Notolimea crassa (Forbes, 1843)

Literature: Vadsø (G.O. Sars 1878), Varangerfjord (Jensen 1912, Madsen 1949). RUCA-coll.: - *Remarks:* *Lima sarsii* Lovén, 1846 is a synonym.

Pododesmus squamula (Linnaeus, 1758)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Varanger- and Klosterelvford (Norman 1902). RUCA-coll.: Store Ekkerøy.

Remarks: The authors cited above referred this species to *Anomia ephippium* Linnaeus, 1758. This is, however, a more southern species which does not belong to the fauna of East Finnmark. Jensen (1912), Winckworth (1922) and Dons (1937) discuss this matter in more detail.

Lucinoma borealis (Linnaeus, 1767)

Literature: Vadsø (G.O. Sars 1878). RUCA-coll.: -

Axinopsida orbiculata (G.O. Sars, 1878)

Literature: Vadsø (G.O. Sars 1878), Vadsø and «all Sør-Varanger fjords» (Norman 1902). RUCA-coll.: Store Ekkerøy. *Remarks:* *Axinopsida* Keen & Chavan, 1951 is preferred here because *Axinopsis* G.O. Sars, 1878 is preoccupied by *Axinopsis* Tate, 1868 (see Vokes 1967).

Thyasira gouldii (Philippi, 1845)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Varanger-, Bøk- and Langfjord (Norman 1902). RUCA-coll.: Vestre Jakobselv, Store Ekkerøy.

Remarks: This and the following species have been regarded as varieties of *T. flexuosa* (Montagu, 1803). Ockelmann (1958) and Nordsieck (1969) however, state that *T. flexuosa* is a more southern species which probably is absent from northern and arctic regions. Anyhow, the northern *Thyasiridae* should be revised.

Thyasira sarsii (Philippi, 1845)

Literature: Vadsø (G.O. Sars 1878), Vadsø, Klosterelv- and Bøkfjord (Norman 1902). RUCA-coll.: -

Thyasira obesa (Verrill, 1882)

Literature: Vadsø (G.O. Sars 1878, Norman 1902). RUCA-coll.: -

Mysella bidentata (Montagu, 1803)

Literature: Madsen (1949) reported this species from Finnmark, but records from Varangerfjorden are unknown to us. RUCA-coll.: Store Ekkerøy.

Mysella maltzani (Verkrüzen, 1876)

Literature: Vadsø (G.O. Sars 1878). RUCA-coll.: Store Ekkerøy (see also Backeljau et al. 1984b).

Remarks: This species is usually considered to have a sporadic occurrence (Bernard 1979b). At

Store Ekkerøy, however, it is one of the most abundant bivalves, as it is only outnumbered by *Turtonia minuta*. *M. maltzani* resembles much *Altenaeum dawsoni* (see further), but once both species are compared, they are usually easy to distinguish (Backeljau et al. 1984b).

Montacuta substriata (Montagu, 1808)

Literature: G.O. Sars (1878) mentioned this species from Øksfjord in West Finnmark. However, no records from Varangerfjorden are known to us. RUCA-coll.: Store Ekkerøy. *Remarks*: This species was described in 1808 and not in 1803 (see Montagu 1808: p. 25 sub nomen *Ligula substriata*).

Altenaeum dawsoni (Jeffreys, 1864)

Literature: -

RUCA-coll.: Store Ekkerøy (see also Backeljau et al. 1984b).

Remarks: Madsen (1949) and Bernard (1979b) suggested that this form may be conspecific with *Mysella maltzani*. Backeljau et al. (1984b), however, have shown that the two species are clearly different. As stated by Warén (1980) the exact date of publication is 1864 and not 1863. It appears to us that *Mysella kurilensis kurilensis* Scarlato & Ivanova, 1974 and *M. k. littoralis* Scarlato & Ivanova, 1974 are closely related to *A. dawsoni*. Undoubtedly, the northern and arctic «Montacutidae» are badly in need of revision.

Astarte borealis (Schumacher, 1817)

Literature: Elvenes (De Guerne 1886), Lang- and Klosterelv-fjord (Norman 1902). RUCA-coll.: Vestre Jakobselv, Store Ekkerøy.

Remarks: As the northern and arctic Astartidae need to be revised, we use here the somewhat conservative nomenclature of Abbott (1974), Bernard (1979b) and Lubinsky (1980). According to the latter author, the very closely related *A. arctica* (Gray, 1824) would occur in the Barents and White seas and in northern Norway. However, no records from Varangerfjorden are known to us.

Astarte elliptica (Brown, 1827)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), «all Sør-Varanger fjords» (Norman 1902). RUCA-coll.: Varangerbotn, Vadsø, Store Ekkerøy. *Remarks*: This species is best recognised by the mesh-like structure of the periostracum (see Ockelmann 1958: pl. 1 fig. 3).

Astarte sulcata (Da Costa, 1778)

Literature: Elvenes (De Guerne 1886). RUCA-coll.: - *Remarks*: The species' occurrence in Varangerfjorden needs confirmation, as it is not impossible that De Guerne's identification was erroneous.

Astarte crenata (Gray, 1824) s.l.

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Varanger-, Lang- and Klosterelv-fjord (Norman 1902). RUCA-coll.: Store Ekkerøy.

Remarks: We include here *A. acuticostata* Jeffreys, 1881, *A. crebricostata* MacAndrews & Forbes, 1847, *A. crenata subaequilatera* Sowerby, 1855 and *A. crenata inflata* Hägg, 1904. A discussion of this difficult species complex may be found in Jensen (1912), Ockelman (1958) and Lubinsky (1980).

Astarte montagui (Dillwyn, 1817) s.l.

Literature: Elvenes (De Guerne 1886), Vadsø, Lang- and Klosterelv-fjord (Norman 1902). RUCA-coll.: Varangerbotn.

Remarks: We include here *A. warhami* Hancock, 1846, *A. striata* (Leach, 1819), *A. globosa* Møller, 1842, *A. banksii* (Leach, 1819) and *A. compressa* (Montagu, 1808). The taxonomic relations between these forms, however, need to be revised. A recent discussion of this complex is presented by Scarlato (1981).

Serripes groenlandicus (Bruguière, 1789)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), «in Laminarian zone throughout East Finnmark» (Norman 1902), Kjølmsøy (Dons 1937), «many findings from the Varanger district» (Soot-Ryen 1951). RUCA-coll.: Store Ekkerøy.

Remarks: Although G.O. Sars (1878) reported only juvenile specimens of this species, large adults are not at all rare in the region. The largest specimen in the RUCA collection measures 100 x 80 mm.

Clinocardium ciliatum (Fabricius, 1780)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Varanger-, Lang- and Klosterelv-fjord (Norman 1902), «many localities in the Varanger district» (Soot-Ryen 1951). RUCA-coll.: Varangerbotn.

Remarks: Scarlato (1981) places this species together with *Serripes groenlandicus*, in a separate family (Clinocardiidae Kabanov, 1975). We, however, consider both species to belong to the Cardidae.

Parvicardium ovale (Sowerby, 1840)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), «in all the East Finnmark fjords» (Norman 1902). RUCA-coll.: Store Ekkerøy. *Remarks*: *Cardium fasciatum* Montagu, 1808 is considered synonymous.

Cerastoderma edule (Linnaeus, 1758)

Literature: G.O. Sars (1878) reported this species from West Finnmark, while Norman (1902) definitely excluded the species from the fauna of East

Finnmark. RUCA-coll.: Varangerbotn, Vestre Jakobselv, Store Ekkerøy, Karlebotn.

Remarks: Recently Hermans (1977) found the species also at Kamoyvaer (island of Magerøy) and Russell (1971) mentioned even the White Sea.

Vepricardium elegantulum (Beck, 1875)

Literature: The whole Finnmark coast (G.O. Sars 1878), Elvenes (De Guerne 1886), Varanger-, Bøk- and Langfjord (Norman 1902). RUCA-coll.: -

Acanthocardia echinata (Linnaeus, 1758)

Literature: G.O. Sars (1878), Jensen (1912) and Madsen (1949) reported the species from West Finnmark, but not from East Finnmark. RUCA-coll.: Vestre Jakobselv, Store Ekkerøy.

Spisula elliptica (Brown, 1827)

Literature: Vadsø (Norman 1902). RUCA-coll.: Varangerbotn, Vestre Jakobselv, Store Ekkerøy. *Remarks:* For the distinction between this species and the closely related *Spisula solida* (Linnaeus, 1758) we refer to Van Urk (1959).

Spisula subtruncata (Da Costa, 1778)

Literature: Elvenes (De Guerne 1886), «one single specimen from Langfjorden» (Norman 1902), Kjølmsøy (Dons 1937). RUCA-coll.: Store Ekkerøy.

Macoma calcarea (Gmelin, 1791)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Vadsø, Lang- and Klosterelvford (Norman 1902), Kjølmsøy (Dons 1937). RUCA-coll.: Varangerbotn, Vestre Jakobselv, Vadsø, Store Ekkerøy. *Remarks:* The northern *Macoma* species are discussed by Jensen (1905) and Scarlato (1981).

Macoma balthica (Linnaeus, 1758)

Literature: Elvenes (De Guerne 1886), Lang- and Klosterelvford (Norman 1902), Kirkenes (Dons 1937). RUCA-coll.: Vestre Jakobselv, Vadsø, Store Ekkerøy, Karlebotn, Sivertbukt.

Tellina fabula Gmelin, 1791

Literature: «one left subfossil (?) valve from the shore at Bugøynes (Sør Varanger)» (Soot-Ryen 1951). RUCA-coll.: - *Remarks:* The species' occurrence in Varangerfjorden needs confirmation.

Arctica islandica (Linnaeus, 1767)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Klosterelvford (Norman 1902). RUCA-coll.: Varangerbotn, Vestre Jakobselv, Store Ekkerøy.

Chamelea gallina (Linnaeus, 1758)

Literature: Vadsø (G.O. Sars 1878, Norman 1902). RUCA-coll.: Varangerbotn, Store Ekkerøy. *Remarks:* We follow the argumentation of Dodge

(1952) for preferring Linnaeus' «*gallina*» over Da Costa's «*striatula*».

Timoclea ovata (Pennant, 1777)

Literature: Vadsø (G.O. Sars 1878). RUCA-coll.: -

Turtonia minuta (Fabricius, 1780)

Literature: Elvenes (De Guerne 1886), Vadsø and Klosterelvford (Norman 1902), Kjølmsøy (Dons 1937). RUCA-coll.: Vadsø, Store Ekkerøy. *Remarks:* Formerly this species was placed among the ercynid clams, but Ockelmann (1964) suggested a much closer relationship with the Veneraceans.

Mya truncata Linnaeus, 1758 (Fig. 2 A, B)

Literature: Vadsø (G.O. Sars 1878), Klosterelvford (Norman 1902), «northern Norway and Finnmark» (MacNeil 1965, Laursen 1966, Strauch 1972, Bernard 1979a). RUCA-coll.: forma *typica*: Varangerbotn, Vestre Jakobselv; forma *uddevalensis* Forbes, 1846: Varangerbotn, Store Ekkerøy.

Remarks: An account of the Norwegian Myidae in the RUCA collection is given by Backeljau (1982). A general review of the Norwegian *Mya*-species and their identification is presented by Stokland (1985).

Mya pseudoarenaria Schlessch, 1931 (Fig. 2 C)

Literature: Soot-Ryen (1951), MacNeil (1965) and Bernard (1979a) report the species in northern Norway, but definite records from Varangerfjorden are unknown to us. RUCA-coll.: Varangerbotn.

Remarks: The largest specimen in the RUCA collection measures 63 x 45 mm. From Børselv (Porsangerfjorden), however, we have a specimen of 76 x 50 mm. Probably the material of Varangerbotn is of subfossil origin. For reasons outlined by Jensen (1900), Schlessch (1931) and Strauch (1972), we cannot regard *M. pseudoarenaria* as a subspecies of *M. truncata* as suggested by Nordsieck (1969).

Mya arenaria Linnaeus, 1758 (Fig. 2 D)

Literature: Elvenes (De Guerne 1886), Vadsø and Klosterelvford (Norman 1902), Kirkenes (Dons 1937). RUCA-coll.: Vestre Jakobselv, Vadsø, Store Ekkerøy.

Remarks: The older records of De Guerne (1886) and Norman (1902) are not completely reliable, as these authors may have confused this species with *M. pseudoarenaria*. In accordance with Strauch (1972) we do not follow Nordsieck (1969) in giving *Arenomya* Winckworth, 1930 full generic rank. The four *Mya* forms in Varangerfjorden are compared in Fig. 2.

Hiatella arctica (Linnaeus, 1767)

Literature: Elvenes (De Guerne 1886), «common throughout the district» (Norman 1902), Kjølmsøy

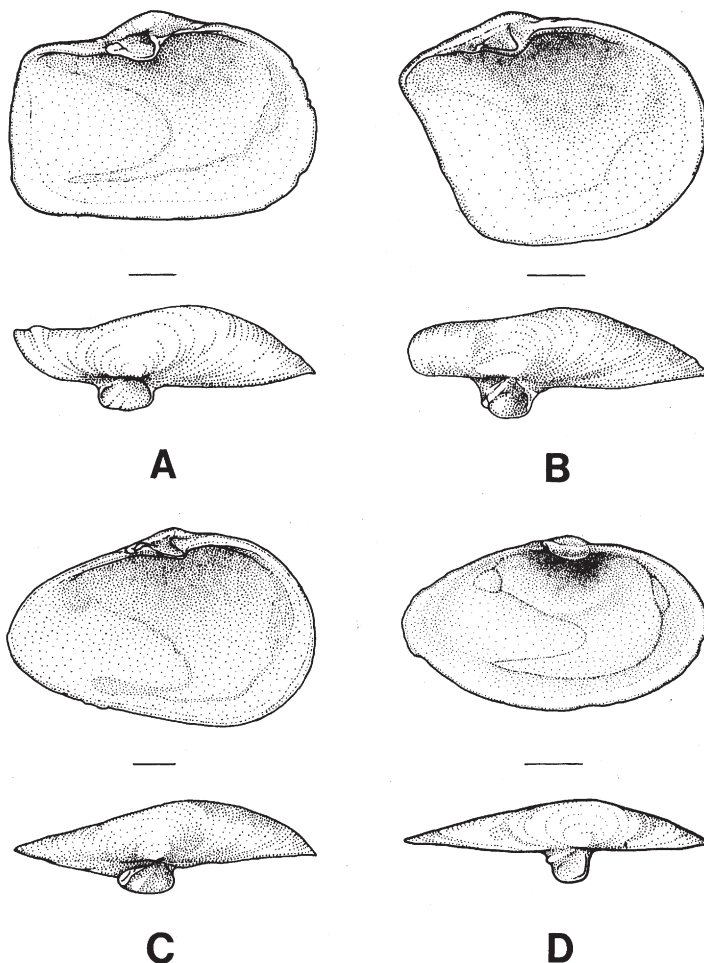


Fig. 2. Comparison of four *Mya* forms from the Varanger district. For each form the inside of the left valve and a top view of the chondrophore is figured. A. *M. truncata* forma *typica* (Vestre Jakobselv). B. *M. truncata* forma *uddevalensis* (Varangerbotn). C. *M. pseudoarenaria* (Varangerbotn). D. *M. arenaria* (Vestre Jakobselv). Scale lines indicate 10 mm.

(Dons 1937). RUCA-coll.: Vestre Jakobselv, Vadsø, Store Ekkerøy.

Remarks: We include here *H. rugosa* (Linnaeus, 1767) and *H. pholadis* (Linnaeus, 1761). The taxonomic relationships between the three European *Hiatella* forms are still very much debated (see Hunter 1949, Madsen 1949, Dodge 1952, Ockelmann 1958, Nordsieck 1969, Abbott 1974). The RUCA collection from Store Ekkerøy consists for the larger part of *H. rugosa*. Nevertheless it contains also some typical *H. arctica* (specimens with two scaled ribs at the posterior side).

Panomya arctica (Lamarck, 1818) (Figs 3-4)

Literature: Elvenes (De Guerne 1886), Klosterelv-fjord (Norman 1902), Leirpollen-Kirkenes (var. *triangula* Dons, 1931) and Tjellsund (Dons 1931, 1937). RUCA-coll.: Varangerbotn.

Remarks: The name *P. spengleri* (Valenciennes, 1843), as reintroduced by Lamy (1923), should not be used (Strauch 1972). The records in the literature and the material in the RUCA collection probably involve subfossil specimens. Their shape actually corresponds more to the shell of *P. trapezoides* Strauch, 1972: the umbo is situated nearly in the middle of the shell, the anterior side is obliquely cut off, the posterior side is more or less obliquely truncated towards the anterior side and the central field on the outside of the valves is relatively well marked (Fig. 3) (Strauch 1972, Janssen et al. 1984). These observations are further supported by measuring and plotting the diagonal lengths of the valves (Fig. 4). These data clearly show that our material falls within the range of *P. trapezoides* and not in that of *P. arctica* s.s. (Fig. 4) (compare Fig. 4 with fig. 9 p. 69 in Strauch 1972). We retain however the name *P. arctica* for our material until

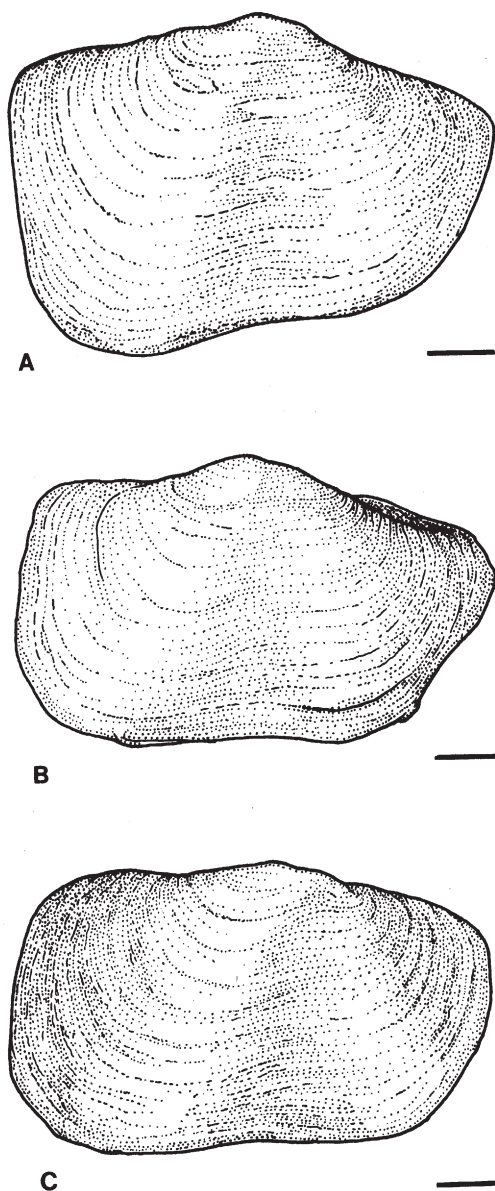


Fig. 3. Examples of »*Panomya arctica*« from Varanger- and Porsangerfjorden (right valves). A, B. Specimens from Varangerbotn. C. Specimen from Børselv (Porsangerfjorden). Scale lines indicate 10 mm.

further research has clarified the taxonomic relationship between this species and *P. trapezoides*. The largest specimen from Varangerfjorden measures 81 x 56 mm. From Børselv (Porsangerfjorden) however, we have specimens reaching a length of 108 mm (RUCA-coll.).

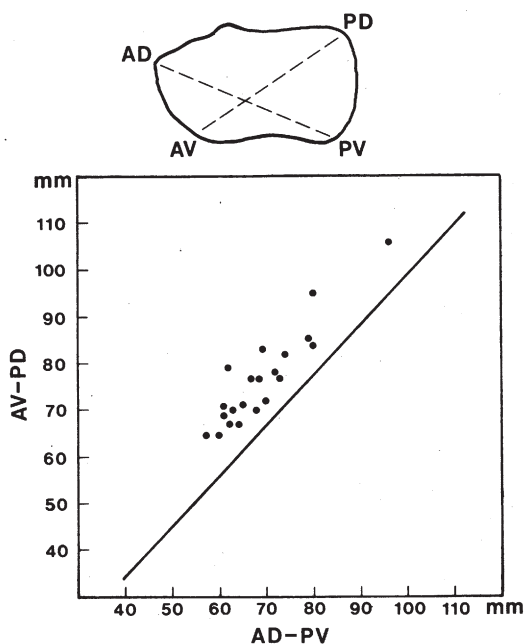


Fig. 4. Graphical representation of the measurements of both diagonal lengths of shells of »*Panomya arctica*« from Varanger- and Porsangerfjorden. AD-PV: anterio-dorsal/posterio-ventral diagonal. AV-PD: anterio-ventral/posterio-dorsal diagonal. According to Strauch (1972, p. 69 fig. 9) the zone above the line represents *P. trapezoides*, whereas the zone under the line refers to *P. arctica*.

Zirfaea crispata (Linnaeus, 1758)

Literature: «Jarfjord, several dead but fresh looking valves» (Soot-Ryen 1951). RUCA-coll.: -

Thracia myopsis Møller, 1842

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Varangerfjord and all Sør-Varanger fjords (Norman 1902), Meskfjord (Soot-Ryen 1941). RUCA-coll.: Vadsø, Store Ekkerøy.

Thracia devexa G.O. Sars, 1878

Literature: Vadsø (G.O. Sars 1878), Bøk-, Kjøl- and Jarfjord (Soot-Ryen 1941). RUCA-coll.: - *Remarks:* The differences between this species and the foregoing are outlined by Soot-Ryen (1941).

Cuspidaria subtorta (G.O. Sars, 1878)

Literature: Vadsø (G.O. Sars 1878), Varanger-, Bøk- and Langfjord (Norman 1902). RUCA-coll.: -

Cuspidaria arctica (M. Sars, 1858)

Literature: Vadsø (G.O. Sars 1878), Elvenes (De Guerne 1886), Varanger- and Bøkfjord (Norman 1902). RUCA-coll.: -

Cuspidaria obesa (Lovén, 1846)

Literature: Elvenes (De Guerne 1886). RUCA-coll.: -

Cuspidaria glacialis (G.O. Sars, 1878)

Literature: Vadsø (G.O. Sars 1878), Varangerfjord (Norman 1902). RUCA-coll.: -

DISCUSSION

De Guerne (1886) reported 43 bivalve species in Varangerfjorden, whereas Norman (1902) found 47 species himself and mentioned 7 additional species without definite localities. As the latter paper covers the marine malacofauna of the whole of East Finnmark, it is not clear whether these 7 species were also collected in the Varangerfjord. Our list here contains 65 species, six of which were not previously mentioned from the Varanger district. They are: *Altenaeum dawsoni*, *Mysella bidentata*, *Montacuta substriata*, *Cerastoderma edule*, *Acanthocardia echinata* and *Mya pseudoarenaria*.

Of course, the number of species may still increase as some of the species aggregates will be splitted conveniently (e.g. *Musculus discors* s.l., *Astarte crenata* s.l., . . .). On the other hand it seems likely that several species which are known to occur in West Finnmark or in other fjords of East Finnmark, may also be found in the Varanger district. Such species are for example: *Poromya granulata* (Nyst & Westendorp, 1839), *Yoldia limatula* (Say, 1831) and *Limopsis minuta* (Philippi, 1836), which all three have been reported from Porsangerfjorden (Friele 1902). So probably the actual species number of the Varanger district ranges between 70 and 80.

It is difficult to compare this number with the situation in other northern fjords, since faunistic information with respect to the bivalves in this region is scarce. It is however, possible to make comparisons with larger areas at about the same latitude. Such comparisons reveal that the species number of the Varangerfjord matches quite well with the corresponding number for the adjacent Barents Sea, which contains 87 bivalve species (Filatova 1962). In other high boreal and subarctic seas, however, the species number is appreciably lower: White Sea (38), Kara Sea (63), Laptev Sea (50), Eastern Siberia (54), Chukchi Sea (48) and western Beaufort Sea (58) (Filatova 1962, Bernard 1979b). Further northwards, species numbers may still decrease: Odhner (1915) for example, reported 44 species from the Icefjord at Spitzbergen.

Two major factors may account for the high species number in the Varanger district. Firstly there is the influence of the North Cape Current,

which raises the water temperature sufficiently to permit several more southern species to survive and reproduce at this latitude (e.g. *Modiolus phaseolus*, *Pododesmus squamula*, *Mya arenaria*, . . .). The second factor determining the high species number, is the diversity of habitat niches in the Varangerfjord. The inner parts of the fjord (e.g. Varangerbotn) and the different side branches in Sør-Varanger are characterised by more arctic and brackish environmental conditions, whereas along the northern coast of the Varangerfjord true marine conditions prevail. Besides this, the fjord contains also a variety of available substrates: intertidal sandy beaches gently sloping into shallow water habitats (e.g. Store Ekkerøy), rocky shores covered with *Laminaria* and *Fucus* (e.g. Vestre Jakobselv, Vadsø, Store Ekkerøy. . .), stony beaches (e.g. Salttjern), steep cliffs (some parts of Sør-Varanger) and intertidal mud flats (e.g. Varangerbotn, Sivertbukt, Karlebotn, . . .). Finally, in addition to the shallow water habitats, the fjord contains also a large deep water area (100–400 m). Thus altogether, the Varanger district displays a great diversity of habitat niches and consequently it houses a relatively rich bivalve fauna. In many other subarctic and high boreal seas, the intertidal and shallow water habitats are usually severely disturbed or even destroyed by ice-scour. This fact may partially account for the lower species diversity in these regions.

The importance of the Varangerfjord as a marine environment for bivalves is also demonstrated by the fact that Vadsø is the type-locality for five species which have been described by M. and G.O. Sars: *Portlandia intermedia*, *Axinopsida orbiculata*, *Cuspidaria arctica*, *C. glacialis* and *C. suborta*.

A final remark to be made here, is that at Store Ekkerøy not less than 36 bivalve species were collected. This site has also a rich gastropod fauna, comprising 47 species (Backeljau et al. 1984a). Hence the total number of mollusc species found at Store Ekkerøy amounts to at least 83 («Nudibranchia», Polyplacophora and Scaphopoda not included).

ACKNOWLEDGEMENTS

Mr. R. Schaerlaeken (University of Antwerp) prepared some of the drawings. Dr. J.A. Sneli (University of Trondheim) checked some of our identifications. We are indebted to Prof. Dr. W.N. Verheyen (University of Antwerp) for providing us with the necessary working facilities.

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