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CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton

Sheet 82

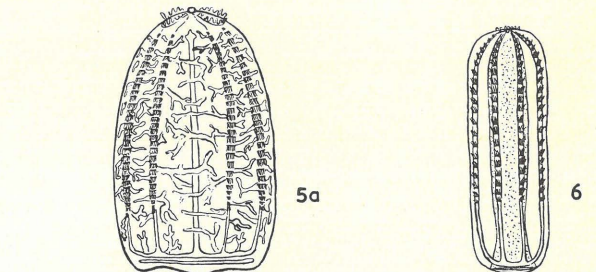
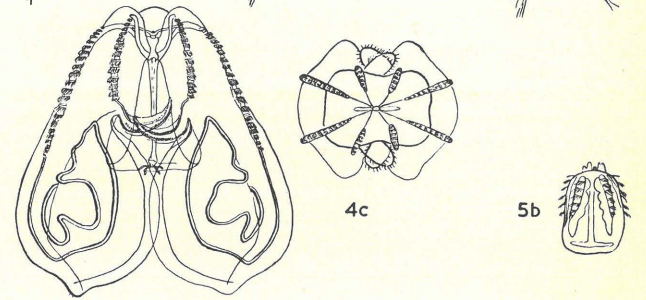
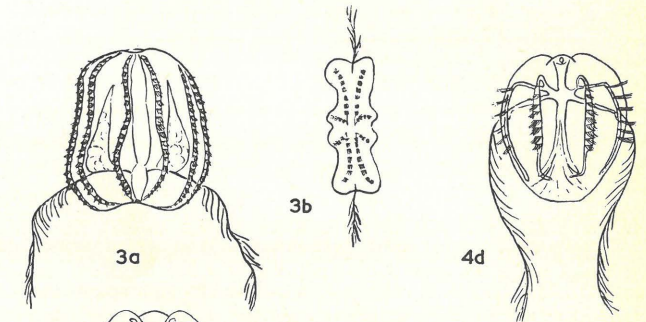
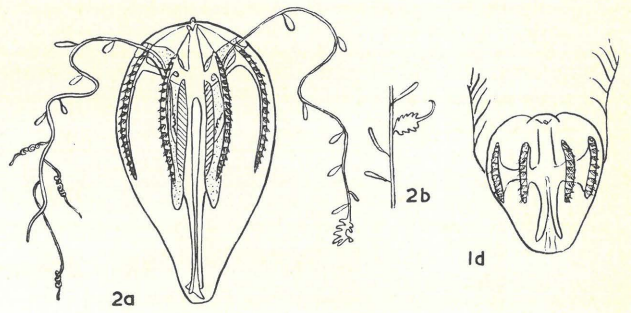
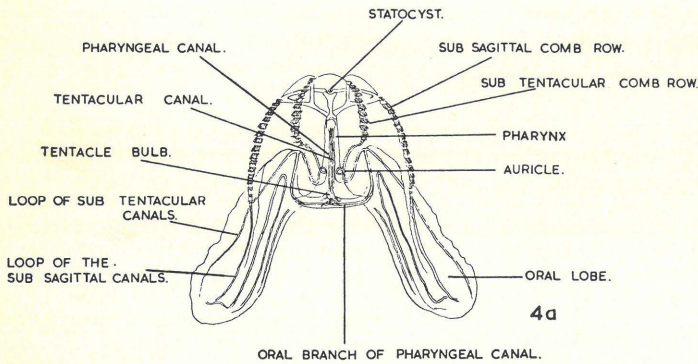
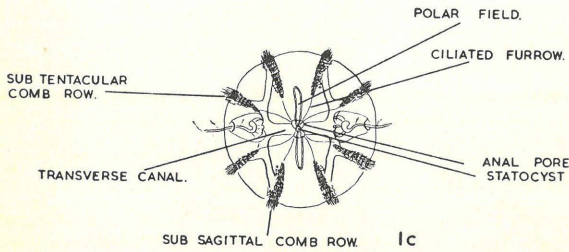
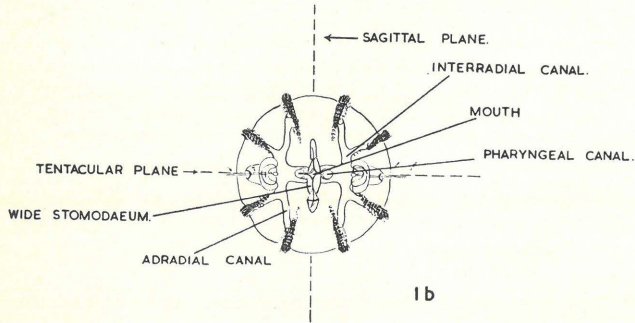
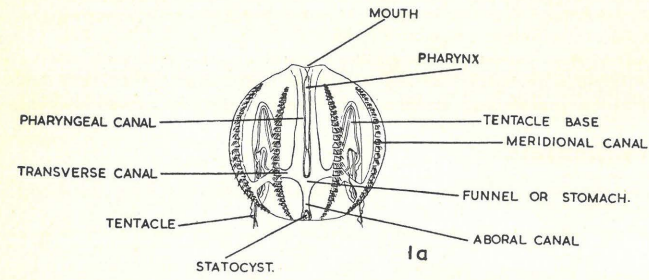
CTENOPHORA

(By R. Liley)*

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1. *Pleurobrachia pileus*: a, lateral; b, oral; c, aboral views; d, larva.
 2. *Hormiphora plumosa*: a, adult; b, part of tentacle.
 3. *Mertensia ovum*: a, lateral; b, aboral view.
 4. *Bolinopsis infundibulum*: a, b, adult; c, aboral view; d, larva.
 5. *Beroë cucumis*: a, adult; b, larva.
 6. *B. gracilis*.

Figs. 1a, b, c; 4a, b, after Agassiz 1849; 1d, after Agassiz 1865; 2b, 4d, after Chun 1880;
 3a, b, after Vanhöffen 1903; 2a, 5a, b, after Mayer 1912; 6, after Künne 1939.

PHYLUM CTENOPHORA

Biradially symmetrical radiata without nematocysts, with gelatinous ectomesoderm containing mesenchymal muscle fibres and with eight meridional rows of ciliary plates present throughout life, or, as in two genera in the larvae only.

Mainly free living planktonic animals which in life swim either way up with equal ease. The species occurring in the NE Atlantic and the coastal waters of NW Europe are: 1, *Pleurobrachia pileus*; 2, *Hormiphora plumosa*; 3, *Mertensia ovum*; 4, *Bolinopsis infundibulum*; 5, *Beroë cucumis*; 6, *B. gracilis*.

Class Tentaculata

Tentacles present.

ORDER CYDIPPIDA

Body simple rounded, oval or cylindrical, in some species compressed laterally in the sagittal plane; tentacles retractible into sheaths; meridional gastrovascular canals ending blindly.

Genus *Pleurobrachia* Fleming 1822

Pleurobrachia pileus (O. F. Müller 1776). Fig. 1 (a—d).

Egg to spherical shaped body; tentacular diameter slightly wider than the sagittal; height along the oral-aboral axis in the adult 17—20 mm. Rows of ciliary combs equal in length, starting near to the aboral pole and extending more than three quarters of the distance towards the mouth. Tentacle base widely separated from the pharyngeal vessel; contractile tentacles may be fifteen to twenty times the length of the body. There is a row of similar lateral filaments along one side of the tentacles. Comb-rows milky opaque; ectomesoderm glassy transparent; tentacles and sheath and pharynx are milky or dull orange in colour; in mature specimens the gonads in the meridional canals develop a yellowish appearance.

In newly hatched specimens the comb-rows are represented by four clusters of relatively large inter-radially placed combs, the body is pear shaped and the tentacles develop at the surface. During development the comb-rows lengthen, the tentacles become more complicated and the body becomes more nearly spherical.

Genus *Hormiphora* L. Agassiz 1860

Hormiphora plumosa (Gegenbaur 1856). Fig. 2 (a, b).

Pear shaped body with practically no lateral compression; adult 15—20 mm high. Ciliary-comb rows equal in length starting some distance below the aboral pole and extending two thirds of the distance to the mouth. Tentacle cleft deeper than in *Pleurobrachia*; tentacle base pressed close to the pharyngeal vessel. The long tentacle possesses two kinds of slightly yellowish side branches and a cocks-comb shaped expansion upon the upper side of the base.

NOTE: There is some doubt as to whether *H. plumosa* should be included in this list. Several text-books consider this to be a NW European species and recently A. C. Hardy (1956) refers to *H. plumosa* as "another but rarer ctenophora of our waters . . . It occurs in more oceanic water." I have found no first-hand records of this species in the area being considered. Mortensen (1912) discusses the position of *H. plumosa* in this area and finds that at least one record of *H. plumosa* at Plymouth is due to erroneous identification of *Pleurobrachia*. It seems possible that it would be difficult to distinguish between young specimens of *P. pileus* and *H. plumosa*.

Genus *Mertensia* Lesson 1836

Mertensia ovum (Fabricius 1780). Fig. 3 (a, b).

Body oval in the tentacular plane, markedly compressed in the sagittal plane; adult up to 55 mm high. Sub-tentacular ciliary comb-rows are longer than the sub-sagittal rows and arise nearer to the aboral pole than the latter. Tentacles long and contractible with numerous similar short lateral filaments. Tentacles, comb-rows, and pole plate are light pink in colour. The young form of *Mertensia* is very difficult to distinguish from that of *Pleurobrachia*.

ORDER LOBATA

Two large oral lobes and four auricles; tentacles various, without sheaths; oral ends of gastrovascular canals anastomosed.

Genus *Bolinopsis* L. Agassiz 1860

Bolinopsis infundibulum (O. F. Müller 1776). Fig. 4 (a—d).

Body pear shaped in sagittal plane, laterally compressed in the tentacular plane; large oral lobes comprise one third of the body height; adult up to 150 mm high. Sub-tentacular comb-rows extend in the oral direction into the auricles; sub-sagittal comb-rows much longer and extend to the free outer ends of the oral lobes. Internally the meridional gastrovascular canals anastomose and send loops into the lobes and auricles. Tentacles reduced in length, without sheaths, situated at each side of the elongated mouth; accessory tentacles present along the edge of the mouth. The adult has a milky appearance. The early larva of this species is a cydippid very similar to that of *Pleurobrachia*. It may be distinguished by its lateral compression in the tentacular plane. The oral lobes begin to appear when the larva is about 8 mm high. At this stage the gastrovascular system develops its more complicated form and the tentacle bulbs migrate orally. It is extremely fragile, unless netted and preserved with great care the animal does not survive in identifiable fragments.

Class Nuda

Without tentacles.

ORDER BEROIDA

Of conical form, with very wide mouth and pharynx; meridional gastrovascular canals with numerous side branches.

Genus *Beroë* Browne 1756

Beroë cucumis Fabricius 1780. Fig. 5 (a, b).

Body sack or vase shaped, often compressed in what corresponds to the tentacular plane; adult up to 150 mm high. Ciliary comb-rows equal in length extending from the aboral pole to about three quarters of the distance towards the mouth. There is a row of branched papillae in the form of a figure 8 around the pole plate at the aboral pole. The four meridional canals of each broad side are in connexion orally by means of the oral forks of the pharyngeal canal. Mature specimens are pink in colour especially along the meridional canals and comb-rows. The larva of *B. cucumis* is similar to that of *Pleurobrachia* except that there is no trace of tentacles. Already in the larva the pharynx is greatly expanded. Pink colouration appears only in the later stages, but is more intense in arctic than in warmer water.

Beroë gracilis Künne 1939. Fig. 6.

This species is so far only described from the southern North Sea. Body of slender cylindrical form with little trace of lateral compression; adult rarely as much as 80—100 mm. Young stages more thick set than the adult but still more slender than *B. cucumis* of similar height. Comb-rows may be pink in specimens 30—50 mm high but never such an intensive tint as in *B. cucumis* of the same size.

B. gracilis may occur with *B. cucumis*.

Species	Body form	Lateral compression	Comb-row	Gastrovascular system	Tentacles
1. <i>P. pileus</i>	Oval to spherical	Very slight in sagittal plane	Equal	Blind ending; unbranched	Long; similar lateral filaments Tentacle base widely separated from pharyngeal canal
2. <i>H. plumosa</i>	Pear shaped	None	Equal	Blind ending; unbranched	Long; two kinds lateral filaments Tentacle base close pressed to pharyngeal canal
3. <i>Mertensia ovum</i>	Oval	Marked; in sagittal plane	Subtentac. longer than sub. sag.	Blind ending; unbranched	Long; one kind of lateral filaments
4. <i>Bolinopsis infundibulum</i>	Pear shaped; large oral lobes	Moderate; in tentacular plane	Sub. sag. longer than subtentac.	Complicated; looped, anastomosed ends	Short; accessory tentacles present
5. <i>Beroë cucumis</i>	Sack shaped	Variable; in tentacular plane	Equal	Branched; connected orally on each broad side	None
6. <i>B. gracilis</i>	Slender cylindrical	Slight	Equal	Branched; connected orally on each broad side	None

Further Information on Identification

Agassiz (1849), Chun (1880), Krumbach (1927), Künne (1939), Mayer (1912), Mortensen (1912), Vanhöffen (1903).

Synonymy is discussed by Mayer (1912) and Mortensen (1912).

References to Work on Biology

(a) *Distribution*: Delap (1907), Kramp (1910—31, 1939), Künne (1939), Mayer (1912), Manteufel (1941), Mortensen (1912, 1932), Moser (1909), Plymouth Marine Fauna (1957), Scott (1913, 1919), Vanhöffen (1903).

(b) *Physiology*: Agassiz (1849), Coonfield (1934, 1936), Chun (1880), Gemmill (1918), Gothlin (1929), Harvey (1952), Heider (1927), Hykes (1929, 1931), Hyman (1940), Knight-Jones (1955), Krogh (1916), Lowndes (1942, 1943), Mortensen (1915), Rose (1913), Vernon (1895), Zirpolo (1942).

(c) *Reproduction and Development*: Agassiz (1865, 1874), Allman (1862), Hyman (1940), Kowalevsky (1866), Mayer (1912), Teissier (1934).

(d) *Food and Feeding Behaviour*: Bigelow (1910, 1924), Chun (1880), Krumbach (1927), Kuhl (1932), Lebour (1922, 1923), Lojaco (1908), Main (1928), Nelson (1925), Thorson (1946), Weill (1935).

(e) *Predators and Parasites*: Agassiz (1865), Bigelow (1924), Hansen (1949), Lebour (1916, 1923), Mortensen (1912), Scott (1913), Van Cleave (1927).

(f) *Effect on Plankton and Fisheries*: Bigelow (1915, 1924), Bigelow & Leslie (1928), Manteufel (1941), Nelson (1925), Russell (1935), Scott (1913).

Distribution

Species (Species in brackets occur only exceptionally)

Gulf of Bothnia	1
Gulf of Finland	1
Baltic proper	1
Belt Sea	1, 5
Kattegat	1, 5
Skagerak	1, (2) ?, 5
Northern North Sea	1, 4, 5
Southern North Sea	1, 5, 6
English Channel (eastern)	1, 5
English Channel (western)	1, (4), 5
W Scotland, Bristol Channel and Irish Sea	1, 4, 5
South and West Ireland and Atlantic ...	1, (2) ?, 4, 5
Faroe—Shetland area	1, 4, 5
Iceland	(3) ?, 4, 5
Norwegian Sea and Norwegian coastal water	(1), (2) ?, 4, 5
Barents Sea and Spitsbergen	(1), 3, 4, 5

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