

CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 9

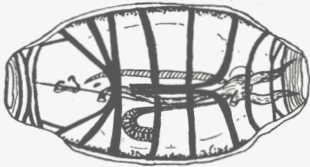
THALIACEA — I

Family: Salpidae

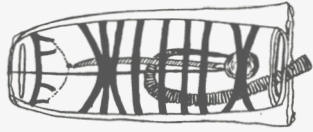
(By J. H. Fraser)

1947.

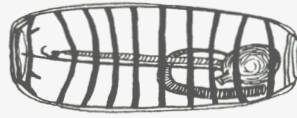
SOLITARY FORMS



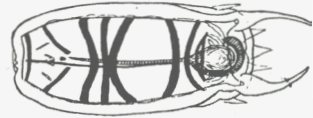
Cyclosalpa bakeri



Salpa fusiformis



Salpa maxima



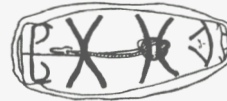
Thalia democratica



Iasis zonaria



Ihlea asymmetrica

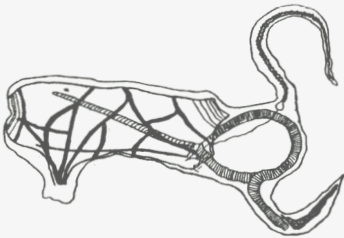


Pegea confoederata



Thetys vagina
(side view)

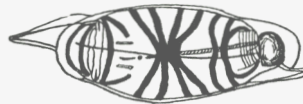
AGGREGATE FORMS



Cyclosalpa bakeri
(side view)



Salpa fusiformis



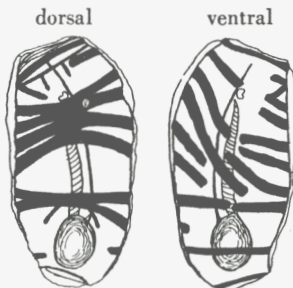
Salpa maxima



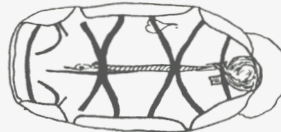
Thalia democratica



Iasis zonaria



Ihlea asymmetrica



Pegea confoederata



Thetys vagina
(side view)

Salps have an alternation of generations in their life history. Solitary forms (=oozoids) are asexual and produce chains of aggregate sexual forms (=blastozoids=gonozoids) by means of budding from a stolon. Asymmetrical aggregate forms are either dextral or sinistral according to the side of the stolon on which they developed.

A. Intestinal tract not forming a ball-shaped "nucleus"..... Genus CYCLOSALPA

B. Intestinal tract forming a more or less compact "nucleus"..... Genus SALPA
 (including the following sub-genera = *Brooksia*, *Iasis*, *Ihlea*, *Metcalcina*, *Pegea*, *Ritteriella*, *Thalia*, *Thetys*, *Traustedia*).

The most satisfactory characters for specific identification are the number and arrangements of the muscle bands, which are characteristic from the early stages (>3 mm.); and the shape of the test: — see figures.

Species	Solitary Forms				Aggregate Forms			
	Length in mm. Normal/Max.	Test	Ventral Muscles	Other points (for dorsal muscles and shape of test see figures)	Length in mm. Normal/Max.	Test	Ventral Muscles	Other points (for dorsal muscles and shape of test see figures)
1. <i>Cyclosalpa bakeri</i> Ritter.....	25/50	flaccid	present	Intestine parallel to gill. Ring of granular luminous material in lateral edges.	30/50	very flaccid	see figure	Large intestinal loop in "post abdomen". Anterior muscles continue into vestigial peduncle. Testis and caecum form trailing appendages.
2. <i>Salpa fusiformis</i> Cuvier.....	40/80	rigid	interrupted	Nucleus with reddish streaks	30/80	rigid	interrupted	Fusiform character (as figure) usual, but protuberance may occasionally be short.
2a. — var. <i>aspera</i> Chamisso.....				Test rigid and spinose				Test rigid and spinose. Protuberances may be long or short.
3. <i>Salpa maxima</i> Forskål.....	50/160	rigid	absent	All muscles independent	50/150	rigid	interrupted	—
4. <i>Thalia democratica</i> (Forskål).....	25/	rigid	continuous	Test protrudes posteriorly in two large and several smaller appendages	15/	rigid	widely interrupted	—
5. <i>Iasis zonaria</i> (Pallas).....	30/65	very rigid	interrupted	—	35/50	very rigid	widely interrupted	Larger specimens often carry embryos up to 20 mm. long.
6. <i>Ihlea asymmetrica</i> (Fowler).....	15/30	very flaccid	present	Usually found in a disintegrating condition.	15/25	very flaccid	asymmetrical (see figure)	Some variability in precise details of muscle arrangements. Usually found in a disintegrating condition.
7. <i>Pegea confoederata</i> (Forskål).....	40/120	rigid	absent	Muscles do not reach to lateral edges of body	?	rigid near the nucleus	absent	Muscles barely reach the lateral edges of body.
8. <i>Thetys vagina</i> (Tilesius).....	< 190 (220 with appendages)	rigid	absent	Number of body muscles varies. Body produced posteriorly into two long appendages.	< 190	rigid	absent	—

Further Information on Identification.

1. *Cyclosalpa bakeri*: Metcalf, 1918, p. 37, Plates 7—10.
2. *Salpa fusiformis*: Metcalf, 1918, p. 88, Figs. 73, 77, 78; Ihle, 1927, p. 26, Figs. 4, 5; Apstein, 1901, p. 7, Fig. 6.
- 2a. — form *aspera*: Metcalf, 1918, p. 92, Fig. 81; Ihle, 1927, p. 28.
3. *Salpa maxima*: Metcalf, 1918, p. 83, Figs. 64, 67, 68; Ihle, 1927, p. 26; Apstein, 1901, p. 10, Fig. 9.
4. *Thalia democratica*: Metcalf, 1918, p. 109, Figs. 104, 107; Ihle, 1927, p. 29, Figs. 6, 7; Apstein, 1901, p. 6, Fig. 5 (as *S. mucronata*).
5. *Iasis zonaria*: Metcalf, 1918, p. 100, Figs. 90, 97, 98; Ihle, 1927, p. 28; Apstein, 1901, p. 10, Fig. 9.
6. *Ihlea asymmetrica*: Metcalf, 1918, p. 183, Figs. 140, 145 (as *Apsteinia*); Ihle, 1927, p. 25, Figs. 2, 3; Apstein, 1901, p. 8, Fig. 7.
7. *Pegea confoederata*: Metcalf, 1918, p. 127, Figs. 119, 123; Ihle, 1927, p. 30.
8. *Thetys vagina*: Metcalf, 1918, 121, Figs. 114, 117; Ihle, 1927, p. 30; Apstein, 1901, p. 10, Fig. 11 (as *Salpa Tilesii*).

(The following species are found in the North Atlantic and the Mediterranean but have not yet been recorded from the area under consideration:

Cyclosalpa affinis (Chamisso), *Cyclosalpa pinnata* (Forskål), *C. pinnata* var. *polae* (Sigl), *Cyclosalpa virgula* (Vogt), *Brooksia rostrata* (Traustedt), *Ihlea punctata* (Forskål), *Salpa cylindrica* (Cuvier), *Metcalfina hexagona* (Q. and G.), *Ritteriella amboinensis* (Apstein).

Salps normally occur at or near the surface of the warmer oceans but tend to become mesoplanktonic as they are carried towards the north European coasts with a concomitant drop in temperature. They are found only in areas directly affected by oceanic water and are reliable "indicators" of such. The occurrence of any particular species tends to be spasmodic and the distribution in the north European area varies with the changes of the Atlantic influx. In favourable conditions they may occur in large swarms.

Distribution

	Species Figures in brackets refer to species that only occur exceptionally.
Gulf of Bothnia	—
Gulf of Finland	—
Baltic proper	—
Belt Sea	—
Kattegat	—
Skagerak	(4)
Northern North Sea	2, 4, 6
Southern North Sea	—
English Channel (eastern)	(4)
English Channel (western)	2, 4, (5), (7), (8)
Bristol Channel and Irish Sea	—
South and West Ireland and Atlantic	1, 2, 2a, 3, 4, 5, 6, (7), (8)
Faroe Shetland Area	1, 2, 4, 5, 6
Faroe Iceland Area	(2), (5), (6)
Norwegian Sea	2, 4
Barents Sea	—

References to Work on Biology.

Farran (1906), 2, 4, 6, 7; Fraser (1940) 1, 2, 4, 5, 6; Garstang (1928), Morphology and Phylogeny; Harant et Vernières (1938), Key; Ihle (1927), 2, 3, 4, 5, 6, 7, 8, Key; Ihle (1935), Anatomy, Life History, etc.; Metcalf (1918), 1, 2, 3, 4, 5, 6, 7, 8, Key; Russell and Hastings (1933), 2, 4, 5; Streiff (1908), Musculature; Thompson (1942), 1, 2, 3, 4, 5, 6, 7, 8.

References.

Apstein, C. 1894. <i>Ergebn. Plankt. Exp. Humboldt-Stiftung</i> , II, E. a; B: <i>Vertheilg. d. Salpen</i> .	Ihle, J. E. W. 1935. <i>Desmomyaria</i> . <i>Handb. d. Zoologie</i> (Kückenthal), Bd. V, 2.
— 1901. <i>Salpidae</i> , <i>Nord. Plankt.</i> 1.	Metcalf, M. M. 1918. <i>The Salpidae: A taxonomic study</i> . U. S. Nat. Mus., Bull. 100, Vol. 2, Pt. 2.
— 1906. <i>Salpen der deutschen Tiefsee-Expedition.</i> , <i>Wiss. Ergebn. der Deut. Tiefsee-Exped.</i> Bd. 12.	Russell F. S. and Hastings, A. B. 1933. <i>On the Occurrence of Pelagic Tunicates (Thaliacea) in the Waters of the English Channel off Plymouth</i> . <i>J. Mar. Biol. Assoc. U. K.</i> , Vol. XVIII, No. 2.
Farran, G. P. 1906. <i>On the Distribution of the Thaliacea and Pyrosoma in Irish Waters: Fisheries, Ireland, Sci. Invest.</i> 1906, 1.	Streiff, R. 1908. <i>Über die Muskulatur der Salpen und ihre systematische Bedeutung</i> , <i>Zool. Jahrb., Abt. f. Syst.</i> , Bd. 27.
Fraser, J. H. 1940. <i>The Distribution of Thaliacea (Salps and Doliolids) in Scottish Waters, 1920—1939</i> . <i>Fisheries, Scot., Sci. Invest.</i> , 1940, No. 1. In the press.	Thompson, H. 1942. <i>Pelagic Tunicates in the Plankton of South Eastern Australian Waters, and their place in Oceanographical Studies</i> . <i>Commonw. Australia, Council Sci. Indust. Res., Bull.</i> No. 153.
Garstang, W. 1928. <i>The Morphology of the Tunicata and its bearings on the Phylogeny of the Chordata</i> . <i>Quart. J. micr. Sci.</i> , Vol. 72, Pt. 1.	Tokioka, T. 1937. <i>Notes on Salpas and Doliolums occurring on the Pacific coast of Middle Japan</i> . <i>Annot. Zool. Jap.</i> , Vol. 16, No. 3.
Harant, H. et Vernières, P. 1938. <i>Faune de France</i> , Vol. 33, Fasc. 2.	
Ihle, J. E. W. 1912. <i>Desmomyaria</i> . <i>Das Tierreich</i> , Lief. 32.	
— 1927. <i>Thaliacea</i> , <i>Tierwelt N. u. Ostsee</i> , Lief. IX, Teil XII a, 2.	