FISHERIES RESEARCH BOARD OF CANADA
Translation Series No. 2057

The Cephalopods

by G. Pfeffer

Original title: Die Cephalopoden

From: Nordisches Plankton Zoologischer, 2 : 31-46, 1964

Translated by the Translation Bureau(DJ)
Foreign Languages Division
Department of the Secretary of State of Canada

Fisheries Research Board of Canada
Biological Station
St. John's, Nfld.

1972

26 pages typescript

FRB 2057

DEPARTMENT OF THE SECRETARY OF STATE
TRANSLATION BUREAU

FOREIGN LANGUAGES DIVISION

CANADA

SECRÉTARIAT D'ÉTAT
BUREAU DES TRADUCTIONS

DIVISION DES LANGUES ÉTRANGÈRES

TRANSLATED FROM – TRADUCTION DE	INTO – EN
German	English

AUTHOR – AUTEUR

G. Pfeffer

TITLE IN ENGLISH – TITRE ANGLAIS

The Cephalopods

Title in foreign language (transliterate foreign characters)

Die Cephalopoden

REFERENCE IN FOREIGN LANGUAGE (NAME OF BOOK OR PUBLICATION) IN FULL. TRANSLITERATE FOREIGN CHARACTERS.
RÉFÉRENCE EN LANGUE ÉTRANGÈRE (NOM DU LIVRE OU PUBLICATION), AU COMPLET. TRANSCRIRE EN CARACTÈRES PHONÉTIQUES.

Nordisches Plankton Zoologischer Teil No. II

REFERENCE IN ENGLISH – RÉFÉRENCE EN ANGLAIS

PUBLISHER – ÉDITEUR	DATE OF PUBLICATION / DATE DE PUBLICATION			PAGE NUMBERS IN ORIGINAL / NUMÉROS DES PAGES DANS L'ORIGINAL
	YEAR / ANNÉE	VOLUME	ISSUE NO. / NUMÉRO	31-46
PLACE OF PUBLICATION / LIEU DE PUBLICATION	1964	2		NUMBER OF TYPED PAGES / NOMBRE DE PAGES DACTYLOGRAPHIÉES: 26

REQUESTING DEPARTMENT / MINISTÈRE-CLIENT: Environment

TRANSLATION BUREAU NO. / NOTRE DOSSIER N°: 0036g

BRANCH OR DIVISION / DIRECTION OU DIVISION: FRB

TRANSLATOR (INITIALS) / TRADUCTEUR (INITIALES): DJ

PERSON REQUESTING / DEMANDÉ PAR: Mr. M.C. Mercer, Biological Stn., St. John's

DATE COMPLETED / ACHEVÉ LE: 17/2/72

YOUR NUMBER / VOTRE DOSSIER N°: 769-18-14

DATE OF REQUEST / DATE DE LA DEMANDE: Dec. 30, 1971

SOS-200-10-6 (REV. 2/68)

DEPARTMENT OF THE SECRETARY OF STATE
TRANSLATION BUREAU
FOREIGN LANGUAGES DIVISION

CANADA

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BUREAU DES TRADUCTIONS
DIVISION DES LANGUES ÉTRANGÈRES

CLIENT'S NO. / N° DU CLIENT	DEPARTMENT / MINISTÈRE	DIVISION/BRANCH / DIVISION/DIRECTION	CITY / VILLE
769-18-14	Environment	Fisheries Research Board	Ottawa
BUREAU NO. / N° DU BUREAU	**LANGUAGE / LANGUE**	**TRANSLATOR (INITIALS) / TRADUCTEUR (INITIALES)**	**DATE**
0036g	German	DJ	17/2/72

Translated from Die Cephalopoden, By G. Pfeffer, pp. IV-31 to IV-46

Family: Sepiolidae

Diagnosis of the family proper (cf. page 24)

Genera of northern Sepiolidae

1. Edge of mantle unattached at dorsal mid-line, nuchal cartilage well developed.

   A. Both dorsal arms of male hectocotylised; the arms have two to four rows of suckers; the suckers gradually become smaller towards the tips of the arms

   Rossia

   B. The left dorsal arm of male hectocotylised; the arms have two rows of suckers; towards the distal end of each arm the suckers suddenly become small and are arranged in four more or less regular rows.

   Semirossia

II. Edge of mantle grown together with the neck at the dorsal mid-line; nuchal cartilage as a result suppressed. Left dorsal arm of male hectocotylised.

Sepiola

Genus Rossia - Owen 1834

Body short, pouch-shaped, blunt. Head large and broad; at least as wide as the mantle opening. Eye opening surrounded by a lid fold. Dorsal margin of iris slightly arched, pupil opening recessed. Arms relatively long and powerful, with two or four rows of suckers. The four rows are sometimes clear, but sometimes also highly unclear and irregular in form. Four to ten rows of suckers on the clavate ends of the tentacles. Fins semicircular in shape, broad point of attachment; towards the rear, but particularly towards the front, the fins project far beyond the point of attachment; usually considerably more than half as long as the mantle. Edge of mantle unattached at neck, with clearly formed nuchal cartilage. The pen (gladius) is feather-shaped, short, takes up about half the length of the mantle, strongly chitinised, with clearly formed lanceolate vane (vexillum) and rachis. Whether the frequently copied drawing by G.O. Sars (Fig. 33) of the shell* of R. glaucopis is quite true to life seems somewhat doubtful to me.

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* Schulp = shell, but Fig. 33 shows the gladius - Translator.

The dimorphism of the sexes is manifest in the fact that the suckers of the 2nd, 3rd and fourth pairs of arms or (in the species with four rows of suckers) the suckers in the outer rows on these pairs of arms increase in size to a greater or lesser extent. Furthermore, the dimorphism is evidenced by hectocotylisation as such, which consists in the basal pads of the suckers in the outer rows on both arms of the first pair becoming slightly elongate in the region of the proximal three fifths, bunching together and thus giving this section of the lateral area of the arm a crest-like appearance. The whole formation is more or less covered by a clearly defined protective border which is not found in any other member of the Sepiolidae family.

Northern Species of the Genus Rossia

A. Clavate tentacle with very large suckers - larger than those of the arms - arranged in four rows at the base of the clavate section. The suckers on the arms arranged in two or four rows.

R. mülleri

B. Clavate tentacle with six to ten rows of suckers which are much smaller than those of the arms.

I. Suckers on arms arranged in two rows (see p. 33); well preserved specimens exhibit papillae on the dorsal mantle surface.

R. glaucopis

II. Suckers at base of arm arranged in two rows, further up in four regular rows (see p. 33). The dorsal mantle surface never has any papillae.

R. macrosoma

The above may probably be regarded as well-defined species. In addition to these, a large number of species have been taken in the waters of the area in question, some of them being unidentifiable and some of them fitting, with varying degrees of certainty, into one or other of the above classifications. At all events, in this genus we have a large number of apparently clear characteristics which manifest themselves differently according to the age or state of preservation of the individual specimens of the species.

Determining the individual species of Rossia involves the same problems as those encountered for Sepiola. There are three species which, strictly speaking, should not really be mistaken or confused because the relevant characteristics are constant and easy to spot, provided one concentrates on the truly identifying features and leaves aside trivial or individual characteristics. It is quite another question whether these species develop other morphological or local forms which one can describe as clearly defined. Nor is it an easy matter to say whether there are less important species which come in between these three main species. To be able to say this one would have to have large numbers of the various species at his disposal and so far no one has had this good fortune. Nevertheless, I have sufficient material at my disposal to collate this and the data and illustrations. given in the literature into a brief description of the various characteristics and their appearance in specimens in various states of preservation. This will perhaps serve a dual purpose. It will be of

value in determining the various species and it will also perhaps prevent many people describing further new species on the basis of insufficient material.

The first identifying feature is the arrangement of the suckers in two or four rows on the arms. R. macrosoma has four rows, R. mölleri and R. glaucopis have two rows. Since R. mölleri has particularly large suckers on the tentacles it should be a simple matter to distinguish between the three species on this basis. This would in fact be the case if there were not references in the literature and if there were not also illustrations which indicate "irregular" arrangement of the suckers in more than two rows. These cases can, however, immediately be related back to the norm and they prove to be dependent on the state of preservation of the specimens. It is, after all possible to give much more information than just state that R. macrosoma has four rows of suckers. An important qualifying feature is that the suckers of the outer rows are noticeably larger than those of the inner rows in the case of the female (Fig. 41), while in the male the outer suckers are very considerably larger than the inner ones. Now, judging by my material, there can be no doubt that in the case of poorly preserved specimens with limp arms the suckers can be shifted so far apart that the regular four-row arrangement is disrupted and is finally changed to a two-row pattern. But of course, in this instance one large and one small pair of suckers would alternate so that the two-row arrangement would stand

out immediately as an unnatural phenomenon. The other way round, if the arms are sufficiently contracted, the two rows of suckers in R. mülleri and glaucopis can move so close together and ultimately interdigitate that an irregular three or four-row pattern can be produced. But in the case of this pseudo four-row layout there is never any noticeable difference in size between the suckers of the outer and inner rows so that, here too, it is not difficult to establish the normal state. It should also be pointed out that the four rows in R. macrosoma extend clearly right up to the tips of the arms, while the pseudo four-row pattern (cf. Fig. 37 of R. hyatti) is transformed again to a regular two-row layout towards the tip of the arms.

Another good identifying feature is the size and number of rows of suckers on the clavate part of the tentacle. On this basis R. mülleri, whose tentacle suckers are larger than those on the arms, stands out clearly from the other species whose tentacle suckers are smaller than the arm suckers. Likewise it may be assumed that definite statements can be made regarding the number of rows of suckers on the clavate portions of the tentacles of Rossia species. This has in fact been done to some extent. However, if one may judge by the example of Sepiola, both the size and the number of rows of suckers change with increasing growth. It is not even possible to say straight off whether the suckers become relatively and absolutely larger with age, for Sepiola oweniana shows us that exactly the opposite can be true.

Once again, to establish these features, a large amount of material from various age groups is required.

The length of the arms in relation to the mantle sac depends entirely on the state of preservation. I have before me some fine specimens of R. macrosoma which I received from the Zoological Station in Naples and in which the ventral arms are 2/3 as long as the mantle sac (measured by placing one point of the calipers between both ventral arms and the other point at the tip of the arm). On the other hand, a moderately well preserved specimen of the same species has an arm measurement 1 2/3 the length of the mantle sac. In this latter case therefore, the arms are relatively speaking more than twice as long as in the former specimen.

Similarly, the relative length of the arms is a characteristic that must be used with extreme caution. In three equally preserved specimens of R. macrosoma which I have from Plymouth, the third arm is barely longer than the second arm in the male, while in the two female specimens the third arm is very considerably longer than the second. In the well preserved specimens from Naples the second arm is longer than the third in one male, in another male specimen the third arm on one side is slightly longer and on the other side considerably longer than the second arm and in the female specimen the second and third arms are equal in length. In an exceptionally soft specimen from the North Sea (female) the third arm is slightly longer than the second.

This at least shows that data regarding the relative lengths of the arms are only of value when one is describing specimens in the same state of preservation.

It is clear that a similar situation exists with regard to the data on the length of the tentacles. To cite just one example, my R. macrosoma specimens from Naples have tentacles 1 1/3 as long as the mantle, while the soft specimen from the North Sea has tentacles almost four times as long as the mantle.

The data regarding the shape of the mantle sac must also be used with caution. In good specimens of R. macrosoma the sac is mainly cylindrical with bluntly rounded rear end and the width of the sac between the fins is little more than half the length of the mantle. In poorly preserved specimens on the other hand the mantle sac is pouch-shaped and just as broad as or much broader than it is long. Verrill mentions in one case that the more pointed ending of the mantle sac can be the result of strong contraction. Even if it is permissible to make a comparison here with Sepiola, this characteristic is nevertheless of little value. Among the large number of equally preserved specimens of Sepiola oweniana and atlantica which I have at my disposal there are some which deviate from the mean in that their mantles either have blunter or more pointed endings.

The angular extension of the dorsal edge of the mantle at the median line is only found in poorly preserved specimens as far as I can judge from my material. In well preserved specimens the dorsal

edge of the mantle follows a completely straight line or it is perhaps even slightly retracted at the centre line (cf. the difference between Figs. 38 and 39). What configuration the mantle edge has *in vivo* is of course quite another question.

The fins are larger in old specimens, i.e. they are longer and broader than in young ones. This is shown in the illustrations of this species which are given in the literature. Furthermore, with very few exceptions, the increase in fin size with growth is a general rule in Cephalopods. It should also be noted that bad preservation increases the size of the fins.

Finally, it should be pointed out that another excellent distinguishing feature, namely the papillate dorsal skin of head and mantle apparently disappears in poorly preserved specimens. Thus, the sole difference between *R. megaptera* and *R. glaucopis* is that the former lacks papillae. However, both the specimens of *R. megaptera* which were examined were quite limp. It should also be mentioned that both sexes (of *R. glaucopis*) are different as regards the forms of the papillae. Finally, some authors state that *R. palpebrosa* has no papillae while Appellöf claims to have found some. Even in the case of this excellent distinguishing feature it is thus necessary to examine a large number of well preserved specimens before a completely clear distinction can be made between the individual species.

The more or less pronounced dimorphism of the sexes as regards the size of the suckers on the arms is certainly a good distinguishing

feature for the species, but it is more pronounced in old specimens than in young. Furthermore, this feature, too, is the subject of contradictory or differing statements by various authors for the same species. The reason for this is to be found in the considerable degree of variance in the feature between the various species or, and this is more likely, in the incorrect identification of the species.

Rossia mülleri Steenstrup 1856 (Fig. 28, 29).

1856. Steenstrup, Vidensk. Selsk. Skr. p. 14.
1886. Becher p. 81.
1898. Posselt (3) p. 273.
1901. Knipowitsch (2) p. 411, Taf. IX f. 28, 29 (Habitusbild), Fig. 37 Radula.
1902. Joubin (3) p. 125, Fig. 27, 28.

The fins are very large and are about $\frac{3}{4}$ the length of the mantle even in small specimens. In large specimens they extend to the front edge of the mantle, whereas in small specimens they end a short distance from it. - The third pair of arms does not seem to be particularly longer than the others. - The suckers on the arms are arranged in two rows at the base of the arms but higher up they become irregular and an indistinct four-row pattern is found. Some specimens show absolutely no signs of a four-row arrangement. According to Posselt the four-row arrangement is in all cases more indistinct in the males. According to Knipowitsch, and also judging by a specimen which I have at my disposal, the four-row pattern seems to be more pronounced in old specimens while in the young specimens the two-row configuration stands out very clearly. - The suckers on the clavate

sections of the tentacles are large, flat and have wide openings. They are arranged in four rows at the base of the clavate section. In the distal half they are arranged in six rows. The two upper rows of suckers at the base of the clavate section (those turned towards the swimming membrane) are particularly large and some of them are always larger than the largest suckers of the arms.

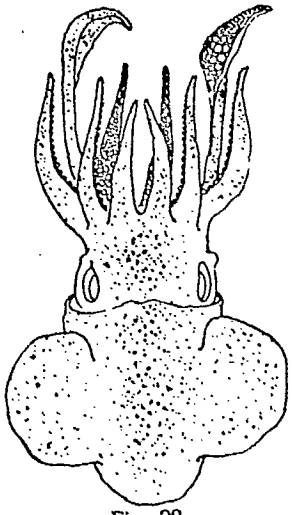

Fig. 28

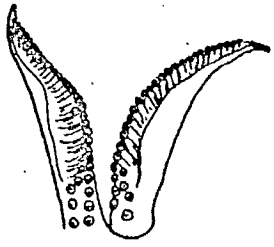

Fig. 29

Fig. 28 Rossia mülleri Steenstrup. Natural size. Original drawing.
Fig. 29 " " Hectocotylised arms. Natural size. After Steenstrup-Joubin.

For details about the hectocotylisation see Posselt (3) p. 274.

The upper side is densely covered with dark-violet chromatophores, while the underside has some but not so many (Knipowitsch). The specimen I have from Spitzbergen is pale and fairly densely covered with small greyish-violet chromatophores. It is paler than any other Rossia that I have seen.

Total length up to 100 mm; from rear end to base of arms 74 mm; mantle sac 52 mm. The specimen which I have has a mantle measuring 28 mm.

The eggs were found by Kükenthal and Walter in East Spitzbergen inside the sponge Esperia constricta.

A. Krause calls the species brought home by Kükenthal and Walter from East Spitzbergen R. glaucopis. However, of the three specimens the one given to the Hamburg Museum is quite definitely R. mülleri.

Distribution:

West Greenland (Posselt), Jan Mayen (Becher), Spitzbergen (Hamburg Museum, i.e. Kükenthal and Walter; Knipowitsch).

Rossia glaucopis Loven 1845 (Fig. 30-37)

1845. Lovén (1) p. 135.
1878. G. O. Sars p. 337, Taf. 32 (Habitus-Bilder); Taf. XVII Fig. 6 (Radula).
1886. Hoyle (2) p. 116.
1886. Becher p. 81.
1890. Norman (1) p. 470.
1891. Lönnberg (1) p. 13.
1892. Appellöf (3) p. 7.
1898. Lönnberg (3) p. 791.
1898. Posselt (3) p. 275.
1900. Steenstrup (14).
1901. Knipowitsch (1) p. 538.
1902. Joubin (2) p. 130; Fig. 31, 32.
1869. Rossia papillifera Jeffreys p. 134.
1878. — sublevis Verrill, Am. Journ. Sci. XVI p. 208.
1880. — — — op. cit. XIX p. 291, Taf. 15 Fig. 3.
1881. — — — Bull. Mus. Comp. Zool. VIII p. 104. Taf. 3 Fig. 2—4, Taf. 7 Fig. 4.
1881. — — — (6) p. 104, Taf. 30 Fig. 2; Taf. 31 Fig. 3; Taf. 46 Fig. 4; Taf. 47 Fig. 2—4.
1882. — (7) p. 380; Taf. 34 Fig. 2—6; Taf. 37 Fig. 2.

1886. — — Hoyle (1) p. 117.
1890. — — Norman (1) p. 471.
1889. — — E. A. Smith (2) p. 420.
1900. — — Nichols p. 494.
1878. — hyatti Verrill, Am. Journ. Sci. XVI p. 208.
1880. — — — Op. cit. XIX p. 291; Taf. 15 Fig. 1, 2.
1881. — — — (6) p. 351; Taf. 27 Fig. 8, 9; Taf. 30 Fig. 1; Taf. 31.
1882. — — — (7) p. 377 (167) Taf. 35 Fig. 2, 5, 6; Taf. 36 Fig. 3—6; Taf. 37 Fig. 1.
1898. — — Posselt (3) p. 267.
1902. — — Joubin (2) p. 123 Fig. 25.
1835. — palpebrosa Owen (1) p. 92; Taf. B. Fig. 1; Taf. C.
1885. — — Herzenstein p. 714.
1893. — — Appellöf (3) p. 7, Fig. 7.
1898. — — Posselt (3) p. 27.
1902. — — Joubin (2) p. 120, Fig. 24.

The dorsal surface bears whitish papillae which, according to Joubin's description, are arranged in fairly regular order. In large specimens the fins extend over about 2/3 of the length of the mantle or are almost the same length. The suckers on the arms, with the exception of the dorsal pair, are fairly large and usually arranged in two rows (see also p. 33). The suckers on the clavate section of the tentacle are small, long-stalked and arranged in many rows. The exact number of rows is not stated anywhere. However, if it turns out that R. palpebrosa is to be included here then eight to ten rows at the widest part of the clavate section is probably the usual number. The specimen illustrated by Joubin (Fig. 20), which is almost certainly a male, has very much larger suckers on the second and third arms than the female depicted in Fig. 29. As regards the hectocotylisation, see Appellöf (3) p. 7.

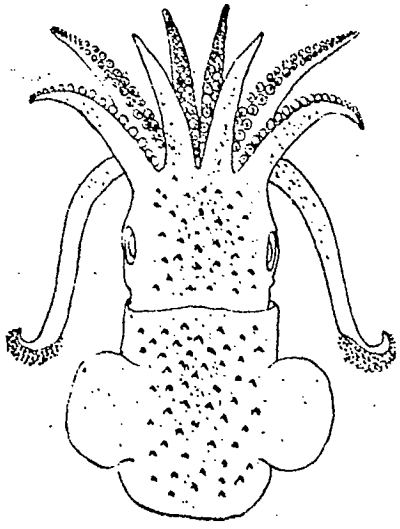

Fig. 30

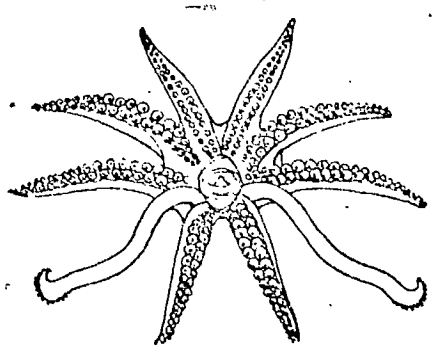

Fig. 31

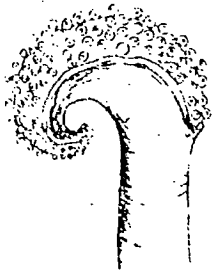

Fig. 32

Fig. 33

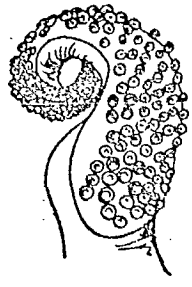

Fig. 34

Fig. 35

Fig. 30:	Rossia	glaucopis Loven.	Natural size. After Sars
Fig. 31:	"	" "	Arms and tentacles seen from above. Natural size. After Sars.
Fig. 32:	"	" "	Clavate part of tentacle. Magnified. After Sars.
Fig. 33:	"	" "	Gladius. 3/2 natural size. After Sars. (The contour of the vexillum is probably not correct).
Fig. 34:	"	palpebrosa Owen	Clavate section of tentacle. Magnified. After Appellöff.
Fig. 35:	"	sublevis Verill	Gladius. 6/1 natural size. After Verrill.

The coloration is brownish-red with many small chromatophores. Length not including arms is 35 mm (Sars), 42-45 mm (Lönnberg). -The eggs are laid in large quantities in soft sponges (Sars).

Steenstrup and Hoyle have shown that R. papillifera is the same as G. glaucopis*. Rossia sublevis Verrill can certainly be included here (Norman, Lönnberg (1)).

R. hyatti also seems to belong here (Fig. 36, 37). Several authors have already drawn attention to the close relationship. The dorsal surface bears papillae and the length of the fins is 4/7 to 2/3 of the length of the mantle. The suckers on the tentacles are very small,

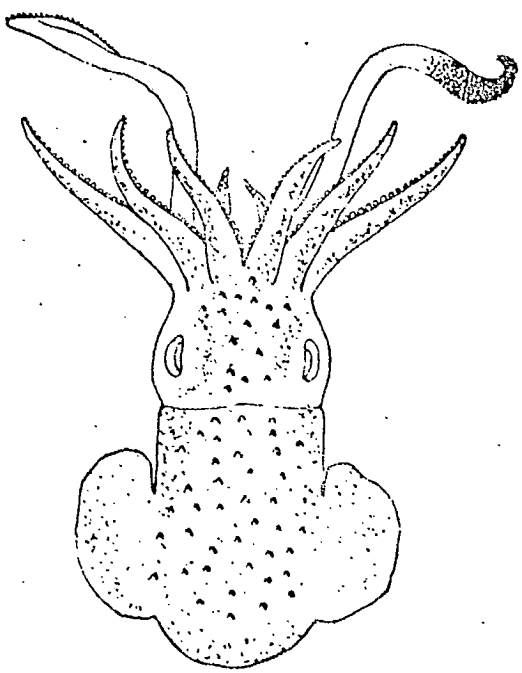

Fig. 36

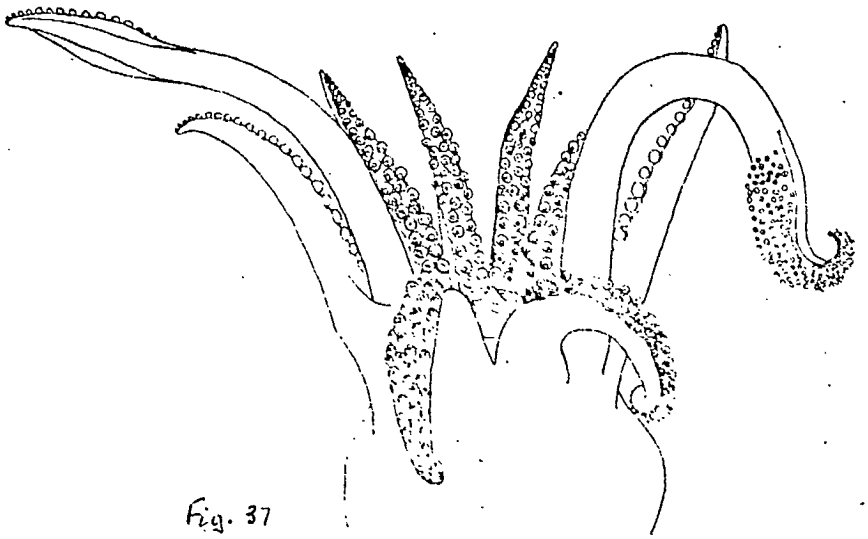

Fig. 37

Fig. 36: Rossia hyatti Verrill. 3/2 natural size. After Verrill.
Fig. 37: " " " Arms and tentacles. 3/1 natural size. After Verrill.

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* Presumably this is an error for R. glaucopis. Translator.

spherical and densely arranged in eight to ten rows. All this points to it being identical with R. glaucopis. The suckers on the arms are arranged in two rows at the base of the arms, then they become more compactly arranged in four rows and towards the tip they are small. A look at Fig. 37 shows that the suckers are not arranged in four orderly rows as in R. macrosoma and the apparent four-row configuration is probably a displaced two-row pattern. The species has been reported from the East Coast of North America, from Massachusetts to Newfoundland, 57-100 fathoms (Verrill); West Greenland, 25-40 fathoms (Posselt).

I likewise wish to include R. palpebrosa Owen here. Most authors, including Joubin, make no mention of papillae on the dorsal surface while Appellöf stresses their presence. This leads one to assume that the various authors are probably not talking about the same species or that the specimens without papillae may perhaps have been poorly preserved. The fins are large and extend over about $\frac{3}{4}$ to 4/5 of the length of the mantle. The suckers on the arms are arranged in a fairly irregular pattern but they exhibit a two-row pattern at the base and in general the pattern is four-rowed further towards the tip. In male and female specimens the suckers are of equal size in the four longitudinal rows of the same arm. The suckers on the lateral and ventral arms of the male are larger than those in the female. The suckers in the upper rows of the proximal section of the clavate part of the tentacle are approximately the same size as

or at least no more than twice as large as the suckers in the lower rows. Towards the tip they decline gradually and almost unnoticeably in size and at this point they are arranged in five to six rows. Jatta (2) p. 139, Plate 15, Fig. 11-20 describes R. palpebrosa from the Mediterranean. Myself, however, I find none of the characteristic features postulated above (by Posselt and Appellöf) in any way clearly pronounced or outstanding.

R. palpebrosa is reported from West Greenland (Posselt); 80°N, 8°E, 260 fathoms (Appellöf); Arctic Russia (Herzenstein).

Distribution of R. glaucopis: West Greenland, down to 349 fathoms (Posselt); Faeroe Channel, 345 fathoms (Porcupine); north of the Shetland Isles, 60-100 fathoms (Jeffreys), 345 fathoms (Porcupine, Hoyle); Jan Mayen (Becher); Spitzbergen (Lönnberg); between Spitzbergen and Barents Island, between Barents Island and Norwar, 123-191 fathoms (Appellöf); the entire Norwegian coast, 40-250 fathoms (Loven, Sars, Grieg); Bohuslan (Lönnberg); S-W Ireland, 250 fathoms (Smith, Nichols); East Coast of North America, down to 450 fathoms (Verrill); Patagonia, off Cape Virgins, 52° 20' S, 67° 39' W, 55 fathoms (Hoyle).

Rossia macrosoma Delle Chiaje 1829 (Fig. 38-43)

1829. Delle Chiaje, Mem. stor. animal. Taf. 71. ——— plate
1838. Gervais und von Beneden p. 36, Taf. 6.
1839. Férussac und Orbigny p. 245. Sepioles Taf. 4 Fig. 13—24.
1851. Vérany p. 60, Taf. 23 Fig. a, b.

1869. Jeffreys (1) p. 133, Taf. 6 Fig. 6.
1890. Norman (1) p. 469.
1893. Appellöf (3) p. 8, Fig. 4 (Tentakelkeule).
1896. Jatta (2) p. 134, Taf. 2 Fig. 5; Taf. 15 Fig. 1–10 bis.
1900. Steenstrup (14) p. 292, Fig. 2; Taf. 16.
1902. Joubin (3) p. 118, Fig. 21, 22.
1842. Rossia Jacobi Ball., Proc. R. Irish Acad. II p. 139 ♀.
1842. Rossia Oweni, Ball, l. c.
1853. — — Forbes u. Hanley 223, Taf. SSS Fig. 1♂.
1886. — — Hoyle (2) p. 114, Taf. 15 Fig. 1—9.
1889. — — Posselt (1) p. 141.
1889. — — Smith (2) p. 420.
1891. — — Lönnberg (1) p. 15.
1869. Rossia Panceri Targioni-Tozzetti p. 46. Taf. 7 Fig. 7♂.
1881. Rossia megaptera Verrill (6) p. 349. Taf. 38 Fig. 1; Taf. 46 Fig. 6.
— Ebenso Verrill (7).
1898. — — Posselt (3) p. 277.
1902. — — Joubin (2) p. 133, Fig. 33.

No papillae on dorsal surface. Fins medium-sized, barely half the length of the mantle according to some illustrations, generally half to 4/7 as long as the mantle in the specimens which I have. The suckers on the arms are large and arranged in two rows at the base, in four rows higher up. On the lateral arms they are significantly larger than on the dorsal and ventral pair. The suckers in the outer rows on the lateral arms are slightly, but definitely, larger than those in the centre rows in the case of the female. In the male the suckers in the outer rows of the lateral arms increase in size until they are many times larger than the suckers in the centre rows. Hectocotylisation is found on both dorsal arms

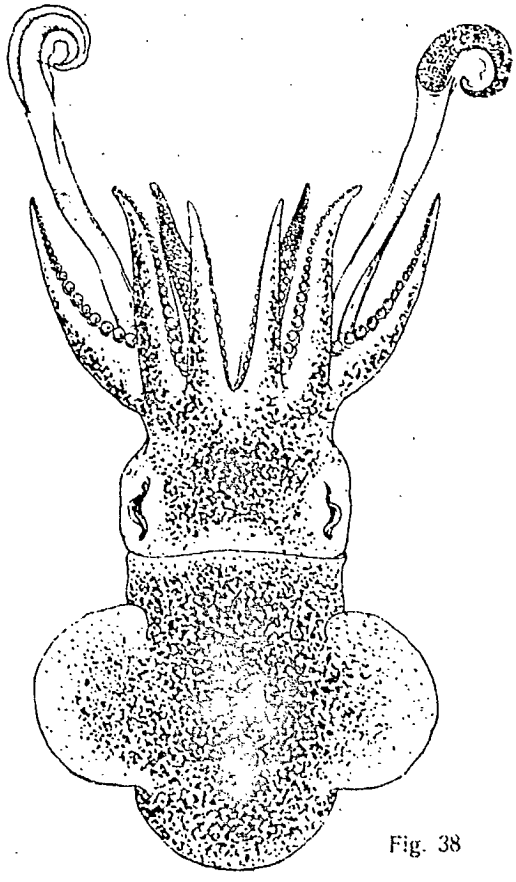

Fig. 38

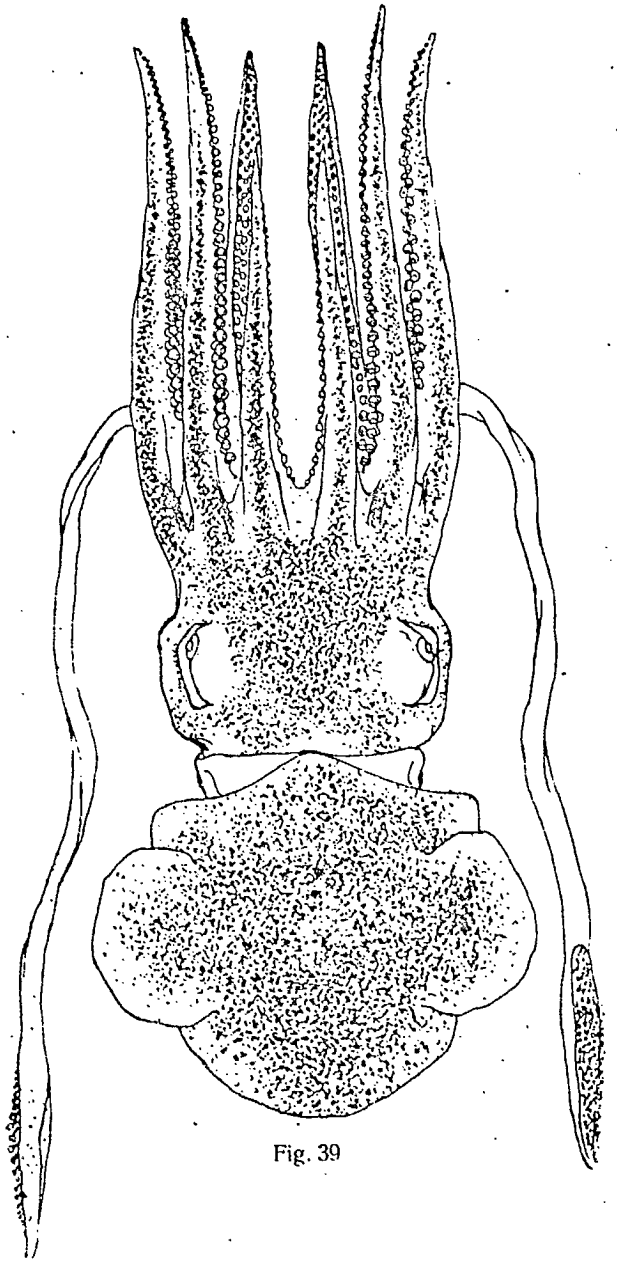

Fig. 39

Fig. 38: Rossia macrosoma Delle Chiaje. Well preserved specimen. Nat. size. Original drawing.

Fig. 39: " " " " Poorly preserved specimen. Nat. size. Original drawing.

Fig. 40

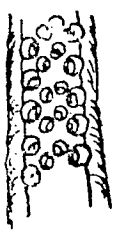

Fig. 41

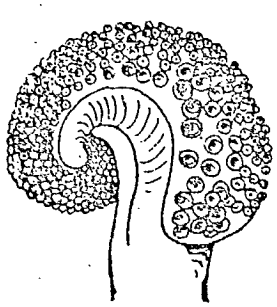

Fig. 42

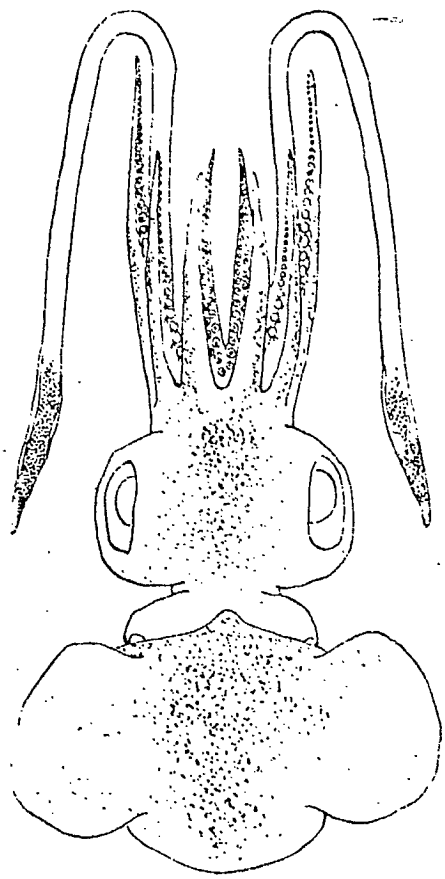

Fig. 43.

Fig. 40: Rossia macrosoma Delle Chiaje. Gladius. 2/1 nat. size. Original drawing.

Fig. 41: " " " " Part of the arm of female showing different sizes of suckers in outer and centre rows.

Fig. 42: Clavate section of tentacle.

Fig. 43: Rossia megaptera Verrill, nat. size, after Verril.

(in the specimens which I have from Naples) or, abnormally, on the left dorsal arm only (Norman). The clavate section of the tentacle bears about ten rows of suckers. These decrease in size from the base of the clavate section towards the tip. They also decrease in size from the outer edge towards the inner edge at the base of the clavate section. The suckers of the outer rows are about three to five times as broad as those of the inner rows.

The eggs were found laid in hollow spaces of Esperia (Lönnberg, p. 17) or in empty shells of Cyprina islandica (Steenstrup, p. 295, 296).

It has been discovered that the northern form (R. oweni) is not a different species from the Mediterranean form (R. macrosoma). Likewise, the R. megaptera Verrill are scarcely anything else but very soft specimens of R. glaucopis.

Length of mantle approx. 40 mm. The mantle of one specimen in the Hamburg Museum which was taken from the North Sea is 48 mm long.

The colour of the alcohol-preserved specimens is a violet-gray fleshy colour or a fairly pure flesh colour with many small purple chromatophores.

Distribution: Ireland, England, Scotland (see Norman, also Herdman, Nichols, Marine Biological Association), North Sea (Hamburg Museum; the exact site of the find is not known since the specimen was found in the mouth of a Gadus aeglefinus bought at the local market); Southern and Western Norway (Sars after Norman); Kattegat (Steenstrup,

Lönnberg); Southern Sweden (Loven, Lönnberg); Mediterranean (Orbigny, Targloni-Tozzetti, Vearny, Jatta). Also reported from the Atlantic, at depth (512 m) extending to the coast of French Sudan (Fischer and Joubin).

The two specimens described as R. megaptera Verrill come from Newfoundland, 150 fathoms (Verrill), and West Greenland, 349 fathoms (Posselt).

Genus Semirossia Steenstrup 1887

Since so far there is only one extant species of this genus it is not possible to say which of the features given in the following description of the species should be included in the diagnosis of the genus. It is quite certain, however, that the unattached edge of the mantle belongs here as well as the unique hectocotylisation of the male which only occurs on the left dorsal arm. In addition, the following should also probably be included in the diagnosis of the genus: The extraordinary enlargement of the suckers of the male in the centre sections of the 2nd, 3rd and 4th pairs of arms; the sudden appearance of four rows of quite small suckers at the ends of the arms; finally the flap-like dorsal margin of the iris projecting into the papillary (TRANSLATOR - sic.; presumably pupillary is meant?) opening of the eye.

Semirossia tenera Verrill 1880 (Fig. 44-47

1880. Verrill, Am. Journ. Sci. Arts XX p. 392.
1880. — (2) p. 360.
1881. — (5) p. 103, Taf. 3 Fig. 5—5b; Taf. 7 Fig. 2—2d, 3—3b.
1881. — (6) p. 357, Taf. 46 Fig. 2—2d, 3—3b; Taf. 47 Fig. 5—5b.
1882. — (7) p. 385 (175), Taf. 33, Taf. 34 Fig. 1.
1891. Lönnberg (1) p. 18.
1886. Hoyle (2) p. 118.
1887. Steenstrup (12) p. 89 ff.
1881. Rossia patagonica Smith p. 22, Taf. 3 Fig. 3.
1886. — — Hoyle (2) p. 119, Taf. 15 Fig. 10-18.

According to Verrill's description the fin is 2/3 as long as the mantle, according to the illustrations it is 4/7 to 4/5 as long. There are no papillae on the dorsal surface. The 2nd pair of arms is the longest.

The suckers of the arms are clearly arranged in two rows. Near the top of the arms they suddenly become fairly small and are arranged in four rows of equal-sized suckers. The four-row pattern is not always clear. Nevertheless, this multi-row layout, which is quite distinct from the two-row configuration, is very characteristic. The suckers in both sexes are larger down the centre of all the arms, but particularly on the 2nd, 3rd and 4th pairs. This feature is particularly pronounced in the male. The right dorsal arm of the male is approximately the same in form as that of the female. The left dorsal arm, on the other hand, is hectocotylised. It is thicker and the suckers are small and more numerous than on the right arm and they are only arranged in two rows at the base of the arm,

otherwise they are arranged in four irregular dense rows. On the ventral side of the arm the basal pads of the suckers are elongated and a protective membrane extending over the proximal 2/3 of the arm is found here. (Verril does not illustrate this membrane nor does he describe it. According to finds of other members of the family, particularly, however, of S. patagonica, it must be assumed that this membrane is well-formed).

The suckers on the clavate section of the tentacle are arranged in approximately eight rows. Two or three rows close to the dorsal edge have very large suckers with dentate inner margin of the chitin ring. Small protective membranes are also found on both sides of the clavate end of the tentacle. There is a well-developed swimming membrane.

The gladius is thin and similar to that of Rossia. It is plumiform with a broad lanceolate vexillum. The width of the latter is not quite equal to 2/5 of its length and the length is 4/9 of the shell.

The colour of the creature in vivo is pale and transparent with scattered pink chromatophores. In the alcohol-preserved specimens the basic colour is pinkish and the specimens are densely covered with large chromatophores, which also occur on the inner surface of the arm between the suckers. The outer part of the fins is, as is normal, colourless. A light stripe is located at the edge of the mantle.

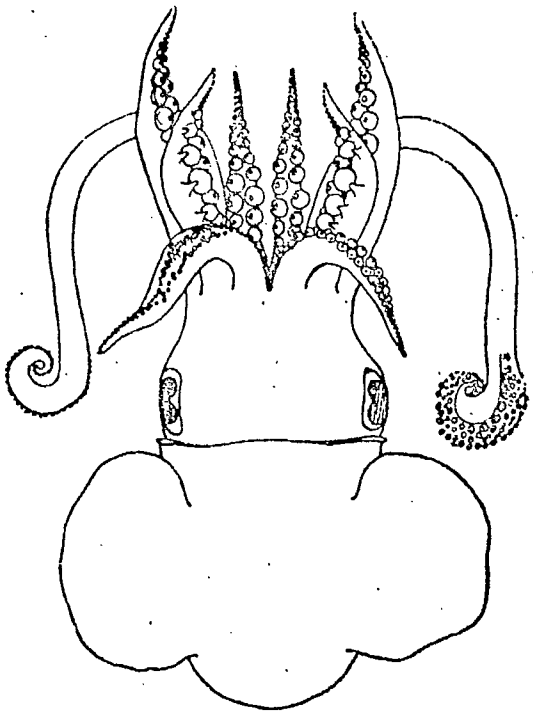

Fig. 44

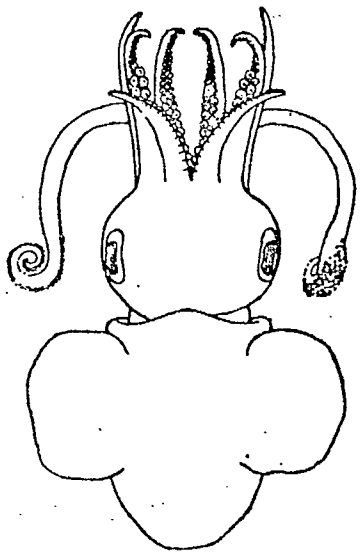

Fig. 45

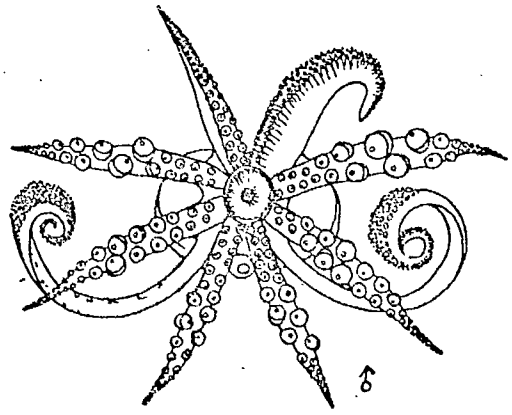

Fig. 46

Fig. 47

Fig. 44: Semirossia tenera Verrill, male. 2/1 nat. size. After Verrill.
Fig. 45: " " " female. " " " " " "
Fig. 46: " " " Arms of hectocotylised male seen from above. 2/1 nat. size. After Verrill.
Fig. 47: " " " Gladius. Nat. size. After Verrill.

- The size is 25 to 30 mm - Verrill had a large number of specimens at his disposal.

As regards morphology and coloration, this species cannot be distinguished from S. patagonica judging by three specimens which I have at my disposal (a male from the Hamburg collection and two females from the Berlin Plate Collection).

Distribution: American coast from 32°-40°N (Verrill). Halifax (43°N) (Challenger, Hoyle). Spitzbergen, Kings Bay (Lönnberg). Northern coast of Siberia (75-76°N, 113° 30' East) (Lönnberg). Eastern, southern and western Patagonia (Smith, Challenger (Hoyle), Hamburg Muesum, i.e. Paessler, Berlin Museum, i.e. Plate).