Ruthenica, 1994, 4(2): 167-171.

Enoploteuthis (Paraenoploteuthis) semilineata, a new species of squid (Cephalopoda, Oegopsida, Enoploteuthidae) from the Southern Pacific

DMITRY O. ALEXEYEV

Russian Institute of Fisheries and Oceanography (VNIRO), Verkhne-Krasnoselskaja 17A, Moscow 107140, RUSSIA

A new species of enoploteuthid squid ***Enoploteuthis (Paraenoploteuthis) semilineata* sp. nov.**, is described. Eight specimens of this species were collected in the Southern Pacific during two cruises of the research vessel *Vozrozhdeniye* in 1987 and 1989.

Enoploteuthis (Paraenoploteuthis) semilineata, новый вид кальмара (Cephalopoda, Oegopsida, Enoploteuthidae) из южной Пацифики

Д.О. АЛЕКСЕЕВ

Всероссийский научно-исследовательский институт рыбного хозяйства и океанографии (ВНИРО), Верхняя Красносельская ул., 17А, Москва, 107140

Описан новый вид кальмара семейства Enoploteuthidae — ***Enoploteuthis (Paraenoploteuthis) semilineata* sp. nov.** Восемь экземпляров этого вида были собраны в Южной Пацифике в ходе двух рейсов НПС "Возрождение" в 1987 и 1989 гг.

Eight unidentified specimens of the genus *Enoploteuthis* were collected from catches of commercial pelagic trawls during two cruises of the research vessel *Vozrozhdeniye* in the Southern Pacific. These specimens differ very strongly from descriptions of all presently known species of the genus *Enoploteuthis*. In my opinion these squids represent a new species.

Enoploteuthis (Paraenoploteuthis) semilineata Alexeyev, sp. nov.

MATERIAL. Holotype: male, 89 mm mantle length, 04.10.1989, 19.00-21.45, 40°10'7 S 127°48'4 W – 40°03'5 S 127°36'7 W, depth 120 m (specimen No. 1), stored in the Zoological Museum of Moscow State University (ZMMSU), No. U-368. Paratypes (ZMMSU No. U-369—U-371, and in VNIRO): one male and two females (specimens No. 2-4) from the same locality as the holotype; one female — 22.09.1989, 19.35-20.00, 36°46'4 S-113°15'2 W – 36°44'0 S-113°18'W, depth 80-90 m (specimen No. 5); a male and a mantle of male — 16.07.1987, 04.55-07.55, 41°47'3 S 139°11'1 W, depth 90-120 m (specimens No. 6 and 7); one female — 19.06.1987, 17.10-20.10, 42°45'5 S-144°29'3 W, depth 50-60 m (specimen No. 8).

DESCRIPTION. The mantle is cylindrical and muscular. It tapers gradually towards long translucent tail. The mantle is the widest at the anterior edge. The dorsal anterior edge of the mantle is only slightly prominent. The ventral anterior excavation of the mantle is shallow and slightly W-shaped, the lateral angles are low but distinct.

Fins are rhomboidal and do not reach the tail end. Their length is about three-fourths of the mantle length. The total width of fins

Table 1. Measurements of the type material of ***Enoploteuthis (Paraenoploteuthis) semilineata*** **sp. nov.** (in mm).

Таблица 1. Основные промеры типового материала ***Enoploteuthis (Paraenoploteuthis) semilineata*** **sp. nov.** (в мм).

Specimen designation	holotype	paratypes						
	1	2	3	4	5	6	7	8
Sex	m	f	m	f	f	m	m	f
Dorsal mantle length	89	83	75	82	65	78	60	61
Ventral mantle length	83.5	80	71	77	62	72	56	57
Fin length	66.5	63	57	62	49	55	42	45
Fin width	64	60	56	59	49	54	47	48
Mantle width:								
at the anterior edge	26	22	20	23	19	21	*	17
at the anterior fin edge	17	18	17	19	15	16	*	17
Head width	20	15	16	18	13	17	*	12
Arm length:								
A1	55	50	*	51	38	*	*	*
A2	62	59	*	59	43	51	*	*
A3	62	60	60	60	46	58	*	*
A4 left	64	63	63	66	50	62	*	46
A4 right	64	66	59	67	48	64	*	46
Tentacle length	155	157	144	*	*	*	*	*
Club length	23	22	22	*	*	22	*	*
Pairs of hooks and suckers on:								
A1	23	24	*	22	23	*	*	*
A2	27	24	*	24	25	24	*	*
A3	24	25	25	24	25	23	*	*
A4 left	25	26	27	26	26	26	*	27
A4 right	26	26	*	28	28	26	*	*
Hooks on the club	8/7	8/8	7/8	*	*	8/8	*	*
Pairs of hooks on A4 right before a hectocotylized part (males only)	9	*	8	*	9	*	*	*

* — not measured because the organ is damaged or absent.

is slighhly smaller than their length when the mantle length exceeds 70 mm, and slightly larger when the mantle length is less than 70 mm. Anterior edges of the fins are almost straight, the posterior edges are slightly concave. The lateral fin angle is about 80°.

The funnel is large and triangular. The funnel-mantle locking apparatus is simple, straight. The funnel organ is comparatively poorly visible in fixed specimens and consists of inverted V-shaped central component and two oval lateral components. The central component has a small papilla anteriorly and two ridges on the limbs.

The head is nearly square in cross section and narrower than the mantle. The funnel groove is comparatively deep and has a distinct edge on each side. The eye opening is transverse oval with a moderately deep sinus. The buccal membrane has eight strong supports which are attached to the arms in the order DDVD. The membrane is not coloured in fixed specimens.

The arms are long, subequal, and slightly shorter than the mantle length. The arms length formula is 4.3.2.1 or 4.3=2.1. Protective membranes of arms are comparatively low, better developed along the ventral side of the arms, especially on arms III. The arms I, II, and IV have small swimming membranes and the arms III have comparatively well-developed swimming keels. The suckers along the most part of length of all the arms are modified into hooks which are enveloped by protective sheaths. The total number of pairs of hooks and arms is 22-28. Chitinous rings of the arm suckers have well developed sharp teeth. Papillae on the ventral surface of arms are absent.

The right ventral arm is hectocotylized but the hectocotylization is not clearly expressed. The ventral protective membrane is widened between 8-9 and 16-17 pairs of hooks and is slightly W-shaped. The dorsal protective membrale slightly widens between 15 and 19 paires of hooks (Fig. 1E). This description of hectocotilus is based mainly on the specimen No. 6 which had fully developed spermatophore in the spermatophoric sac.

Tentacles are approximately two times longer than the mantle length. The stalks are comparatively strong and colourless.

The club is well-developed and has two protective membranes and a swimming keel. The ventral protective membrane width in-

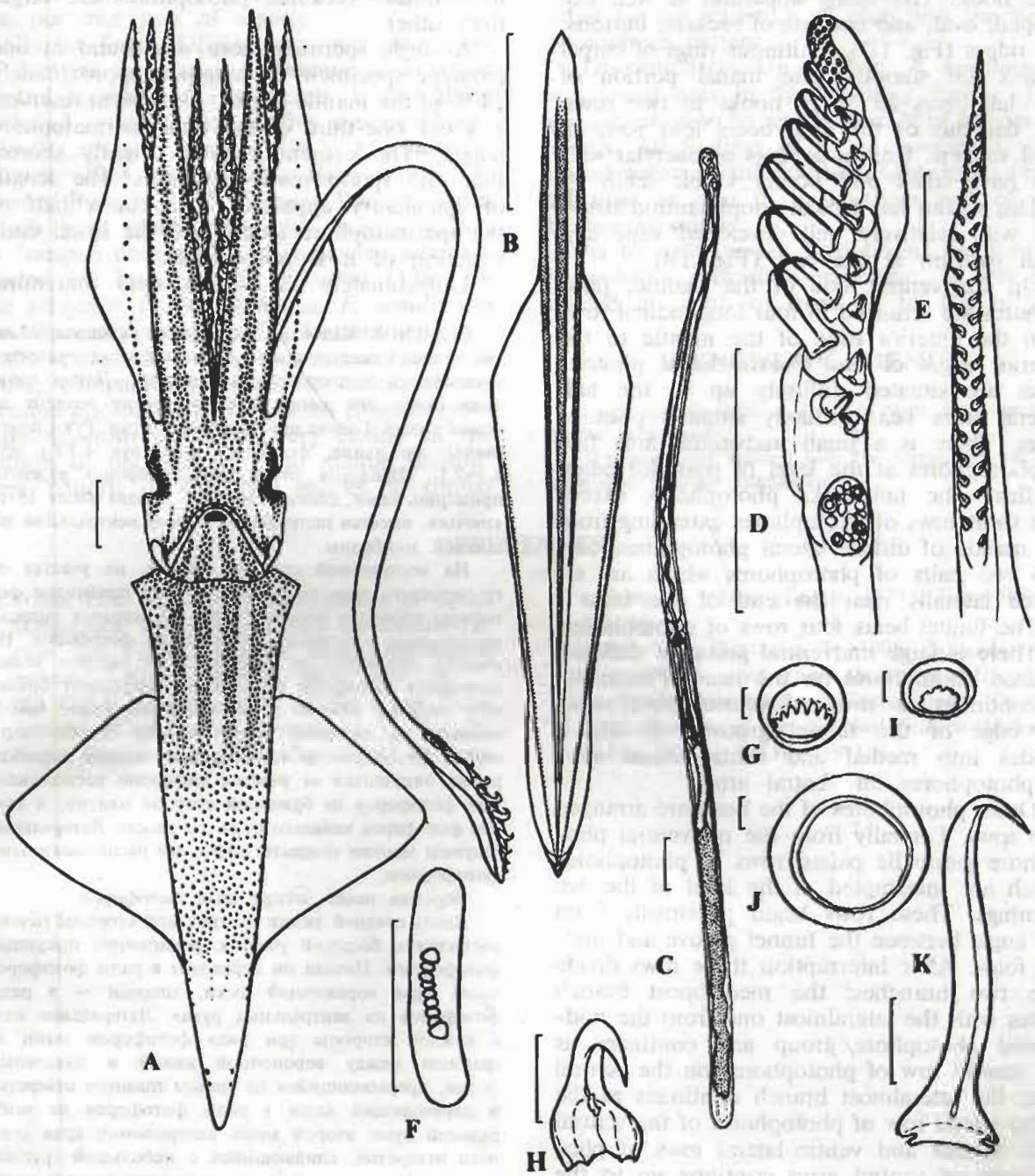

FIG. 1. ***Enoploteuthis semilineata*** **sp. nov.** A — ventral view of the holotype; B — gladius, specimen No. 7; C — spermatophore, specimen No. 6; D — club, specimen No. 3; E — ventral right arm of male, specimen No. 6; F — eyeball photophores, specimen No. 3; G — chitinous sucker ring from distal part of the third arm, specimen No. 2; H — hook from the third arm, specimen No. 2; I — chitinous sucker ring from the dactylus of club, specimen No. 2; J — chitinous sucker ring from carpus of club, specimen No. 2; K — large hook of club, specimen No. 2. Scales: A, B, D, E, F — 1 cm; C, H, K — 1 mm; G, I, J — 0.1 mm.

РИС. 1. ***Enoploteuthis semilineata*** **sp. nov.** A — голотип с вентральной стороны (экз. No. 1); B — гладиус, экз. No. 7; C — сперматофор, экз. No. 6; D — булава, экз. No. 3; E — правая вентральная рука самца, экз. No. 6; F — фотофоры на глазном яблоке, экз. No. 3; G — роговое кольцо присоски с дистальной части третьей руки, экз. No. 2; H — крюк с третьей руки, экз. No. 2; I — роговое кольцо присоски с дактилуса булавы, экз. No. 2; J — роговое кольцо присоски с карпуса булавы, экз. No. 2; K — большой крюк булавы, экз. No. 2. Масштаб: A, B, D, E, F — 1 см; C, H, K — 1 мм; G, I, J — 0.1 мм.

creases between the carpal area and the first large hook. The fixing apparatus is well developed, oval, and consists of suckers, buttons, and ridges (Fig. 1D). Chitinous rings of carpal suckers are smooth. The manal portion of the club bears 15 or 16 hooks in two rows. The dactylus of the club bears four rows of small suckers. Chitinous rings of dactylar suckers have small and poorly visible teeth.

The gladius has typical enoploteuthid structure with relatively well developed vane and small rostrum at the end (Fig. 1B).

On the ventral side of the mantle, photophores are arranged in four longitudinal rows from the anterior edge of the mantle to the anterior edges of fins. Proximalmost photophores are situated diffusely up to the tail. Lateral sides bear diffusely situated photophores. There is a small midventral area free of photophores at the level of posterior edges of fins. The tail lacks photophores except four short rows of photophores extending from the mantle of diffuse lateral photophores, and also two pairs of photophores which are situated laterally near the end of the tail.

The funnel bears four rows of photophores.

There is large midventral group of diffusely situated photophores on the head. Proximally it continues as rows of photophores along the edge of the funnel groove; apically it divides into medial and ventro-lateral rows of photophores on ventral arms.

Other photophores of the head are arranged into rows. Laterally from the midventral photophore group lie paired rows of photophores which are interrupted at the level of the eye openings. These rows begin proximally from the angle between the funnel groove and nuchal folds. After interruption these rows divide into two branches: the medialmost branch unites with the lateralmost one from the midventral photophore group and continues as the medial row of photophores on the ventral arm; the lateralmost branch continues as the dorso-lateral row of photophores of the ventral arm. Medial and ventro-lateral rows of photophores of ventral arms continue up to the tip of arm. Dorso-lateral rows of ventral arms disappear approximately at the two-thirds of the arm length.

The next rows of photophores lie alond the ventral sides of eye openings. Proximally these rows unite with small groups of photophores behind the eye openings.

The lateralmost rows of photophores begin slightly dorsally of the eye sinus and continue into rows of photophores on the ventro-lateral arms. These rows lie along the bases of swimming keels and disappear approximately at the level of three-fourth of the arm length.

Eyeballs bear nine photophores on the ventral side. All photophores are situated closely to each other and slightly and irregularly differ in outlines. Terminal photophores are larger than other.

A single spermatophore was found in one paratype specimen. Its length is approximately 24 % of the mantle length. The sperm reservoir is about one-third of the total spermatophore length. The cement body is slightly shorter than the sperm reservoir length. The length of ejaculatory apparatus is about a half of the spermatophore length and the spiral construction of it is not visible.

Unfortunately all females were immature.

[ДИАГНОЗ. Кальмары небольших размеров. Мантия плавно сужается к заднему концу и заканчивается студенистым полупрозрачным хвостом. Длина плавника около 3/4 длины мантии, он не доходит до конца хвоста. Голова немного уже мантии. Руки почти равные по длине, формула длины рук 4.3.2.1 или 4.3=2.1. Щупальца относительно хорошо развиты, примерно вдвое длиннее мантии. Булава несет 15-16 крючьев, имеется полулунный вырост вентральной защитной мембраны.

На вентральной стороне мантии, на участке от ее переднего края до переднего края плавников фотофоры образуют четыре четких продольных полосы, разделенные участками, лишенными фотофоров. На участке примерно от переднего до заднего конца плавников фотофоры равномерно покрывают брюшную сторону мантии и расположены реже, чем в полосах на передней трети мантии. Хвост почти лишен фотофоров, за исключением четырех коротких рядов, тянущихся от участка диффузно расположенных фотофоров на брюшной стороне мантии, и двух пар фотофоров недалеко от конца хвоста. Латеральные стороны мантии покрыты диффузно расположенными фотофорами.

Воронка несет четыре ряда фотофоров.

Вдоль средней линии вентральной стороны головы расположен большой участок, равномерно покрытый фотофорами. Позади он переходит в ряды фотофоров вдоль края вороночной ямки, впереди — в ряды фотофоров на вентральных руках. Латеральнее идут с каждой стороны три ряда фотофоров: один от границы между вороночной ямкой и нухальным полем, прерывающийся на уровне глазного отверстия и переходящий далее в ряды фотофоров на вентральной руке; второй вдоль вентрального края глазного отверстия, сливающийся с небольшой группой фотофоров позади глазного отверстия; третий начинается немного дорсальнее глазного синуса и переходит в ряд на вентро-латеральной руке.

Вентральные руки несут три ряда фотофоров, из которых медиальный и вентро-латеральный доходят до конца руки, а дорсо-латеральный оканчивается примерно на уровне 2/3 длины руки. Вентро-латеральные руки несут по одному ряду фотофоров вдоль основания плавательного киля, оканчивающемуся примерно на уровне 3/4 длины руки.]

REMARKS. This species can be easily distinguished from all known species of *Enoploteuthis* by photophore pattern of the mantle and the head. None of the known species has large midventral field of photophores on the head and a combination of four longi-

tudinal rows of photophores on the anterior part of mantle and diffuse photophores on the posterior part of mantle.

By the form of fixing apparatus, four rows of dactylar suckers, and presence of enlarged ventral membrane of the club, it should be included in the group of five species (*Enoploteuthis anapsis* Roper, 1962, *E. chuni* Ishikawa, 1914, *E. galaxias* Berry, 1918, *E. higginsi* Burgess, 1982, *E. jonesi* Burgess, 1982) which were characterized by Burgess [1982] as "*anapsis* complex" and somewhat later included by Tsuchiya and Okutani [1988] in the subgenus *Paraenoploteuthis*. ***E. semilineata*** has especially many similar features with Atlantic species *E. anapsis* (numerous hooks on clubs, comparatively strong tentacles, closely situated photophores of eyeballs) [Roper, 1966] differing from the latter very clearly in the pattern of photophores. The mantle photophore pattern of the new species is similar to that of *E. chuni*, but these two species can be very easily distinguished from each other by the structure of club and the head photophore pattern.

DISTRIBUTION. Up to date, ***E. semilineata*** was found only in the Southern Pacific. The species seems to be real inhabitant of temperate waters. All findings of it are associated with mixed waters of the Southern subtropical frontal zone or near it, in northern part of subantarctic waters.

As to bathymetric distribution, the species is probably subsurface-epipelagic. It was recorded at depth of from 50 to 120 m.

ACKNOWLEDGEMENTS

I am very thankful to Dr. Kir Nesis for correction of the manuscript.

This work was realized with the support of the International Science Foundation.

REFERENCES

BURGESS L.A. 1982. Four new species of squids (Oegopsida: *Enoploteuthis*) from the Central Pacific and a description of adult *Enoploteuthis reticulata*. *Fishery Bulletin*, **80**(4): 703-734.

ROPER C.F.E. 1966. A study on the genus *Enoploteuthis* (Cephalopoda, Oegopsida) in the Atlantic Ocean with a redescription of the type species, *E. leptura* (Leach, 1817). *Dana Report*, **66**: 46 pp.

TSUCHIYA K., OKUTANI T. 1988. Subgenera of *Enoploteuthis*, *Abralia* and *Abraliopsis* of the squid family Enoploteuthidae (Cephalopoda, Oegopsida). *Bulletin of the National Science Museum, Tokyo*, Ser.A, **14**(3): 119-136.