

A redescription of *Planctoteuthis levimana* (Lönnerberg, 1896) (Mollusca: Cephalopoda), with a brief review of the genus

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Abstract.—We re-describe *Planctoteuthis levimana* (Lönnerberg, 1896), a poorly known species of oegopsid squid in the Chiroteuthidae, based on two specimens taken from near the type locality. We also designate a neotype for *P. levimana*. We demonstrate that *P. levimana* is a valid taxon through brief comparisons with other members of the genus, and we assess the importance of the funnel locking-apparatus as a species-level character in *Planctoteuthis*.

Planctoteuthis levimana (Lönnerberg, 1896) was originally described as *Mastigoteuthis levimana* based on two specimens, one of which was in fragments. It was transferred to *Valbyteuthis* by Young (1972). Young (1991) subsequently placed the genus *Valbyteuthis* in the synonymy of *Planctoteuthis* which he considered a genus rather than a subgenus as originally described by Pfeffer (1912). *Planctoteuthis levimana* is now the oldest species assigned to this genus. In spite of the early description, this species, to our knowledge, has not been reported since. We describe here two specimens, one of which is in exceptionally good condition, although arm tips and tentacular clubs are missing. The other specimen is badly damaged but has a single tentacle with an intact club. Here we are able to add additional details to the original description, including the previously unknown thick, vesiculate, gelatinous lobes

around the head and eyes. Additional information is available on the worldwide web at: <http://tolweb.org/tree?group=Planctoteuthis>.

Systematics

Planctoteuthis Pfeffer, 1912

Diagnosis.—Chiroteuthid without photophores. Eyes project ventrally from head. Arms IV with relatively few suckers aligned essentially in single series. Tentacular clubs small, compact. Funnel valve absent. Funnel locking-apparatus without tragus but with antitragus.

Planctoteuthis levimana (Lönnerberg, 1896)

Figs. 1, 2d, e, k–o

Material examined.—Specimen no. 1: Neotype (Bergen Museum cat. no. ZMBN 77635), 60 mm ML, immature female taken on 1 Jul 2004 at 41°18'N, 28°15'W in a midwater trawl that fished from 0–2400 m. Specimen no. 2: (Bergen

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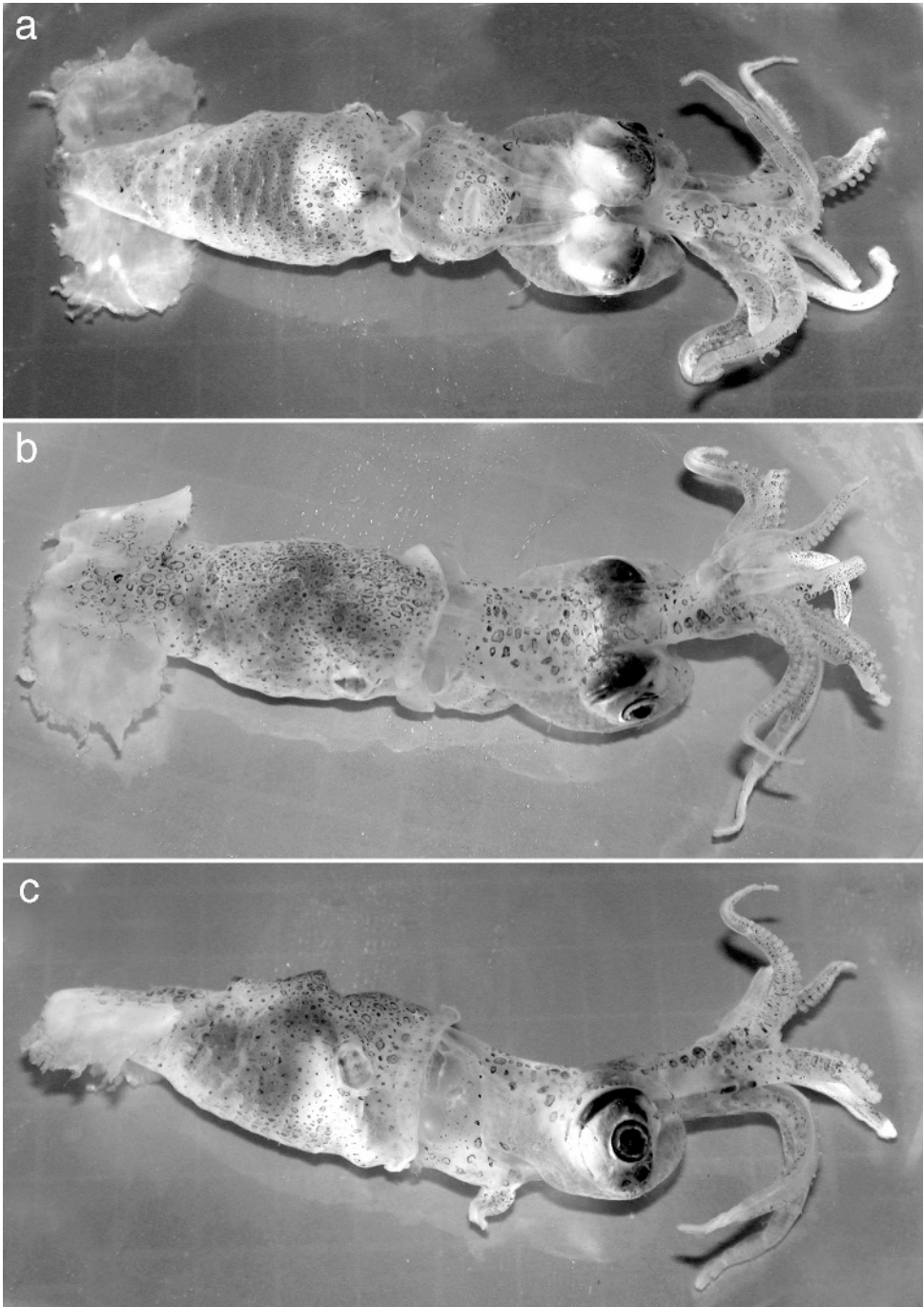


Fig. 1. *Planctoteuthis levimana*, specimen no. 1 (neotype), 70 mm ML, photographs of squid prior to fixation. (a) ventral view, (b) dorsal view, (c) side view.

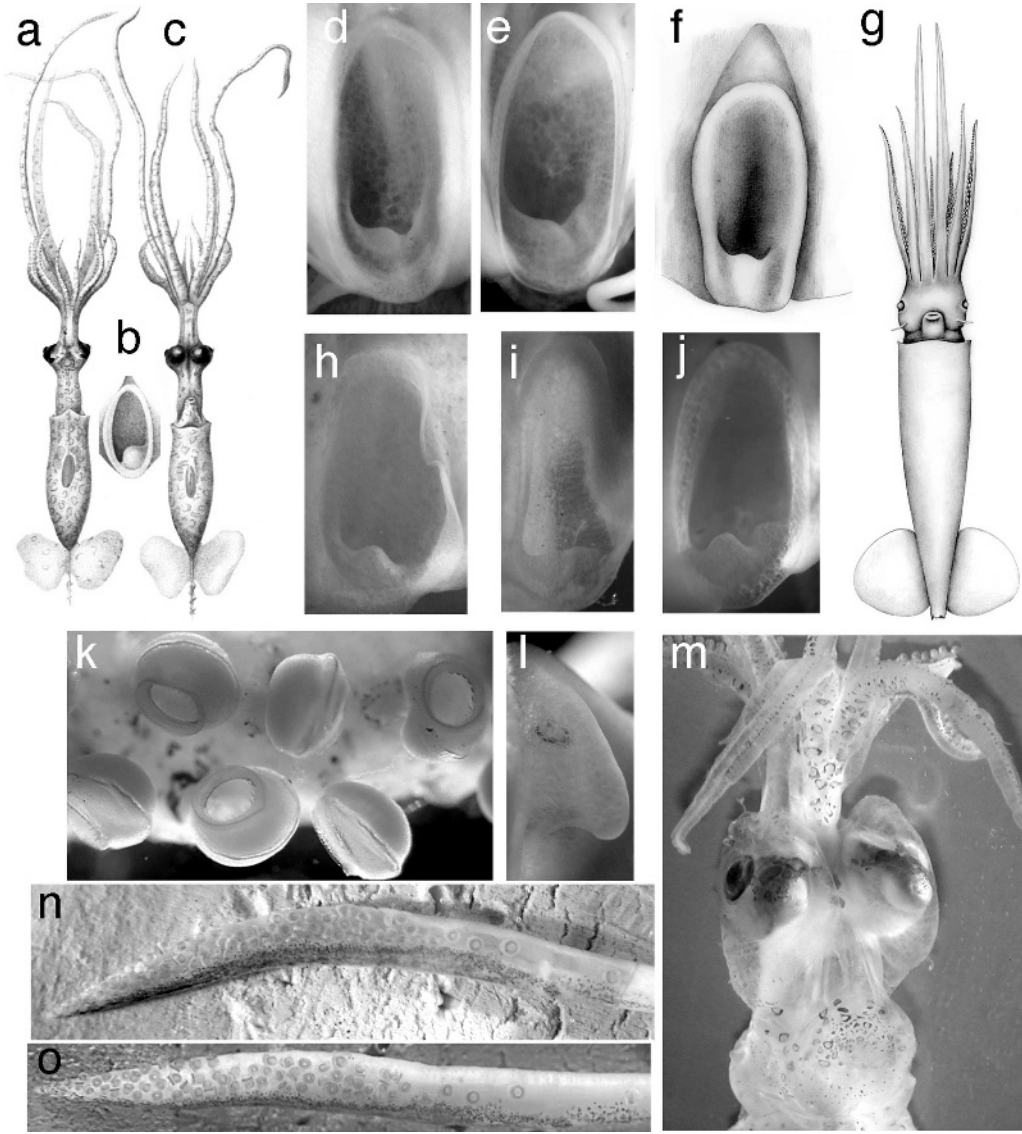


Fig. 2. (a–c) *Planctoteuthis exophthalmica*. (a) dorsal view, 25 mm ML, drawing from Chun, 1910, (b) frontal view of funnel locking-apparatus, drawing from Chun, 1910, (c) ventral view, drawing from Chun, 1910; (d–g, k–o) *Planctoteuthis levimana*. (d) frontal view of funnel locking-apparatus of specimen no. 2, (e) frontal view of funnel locking-apparatus of neotype, (f) frontal view of funnel locking-apparatus of type specimen, now lost; drawing by J. Schroeder, (g) ventral view of type specimen, drawing by J. Schroeder, (k) oral view of arm showing sucker dentition, (l) lateral view of mantle locking apparatus, (m) ventral-oblique view of head showing separation of gelatinous lobes between eyes, (n) oral-oblique view of tentacle showing lack of keel, (o) oral view of tentacle; (h) *Planctoteuthis oligobessa*. Frontal view of funnel locking-apparatus; (i) *Planctoteuthis lippula*. Frontal view of funnel locking-apparatus; (j) *Planctoteuthis danae*. Frontal view of funnel locking-apparatus.

Museum cat. no. ZMBN 77636), 70 mm ML (estimate), sex undetermined, taken on 1 Jul 2004 at 41°31'N, 29°55'W in a midwater trawl that fished from 800–

1800 m. These two squid were captured in the north Atlantic Ocean north of the Azores within a few degrees of the type locality, 43°N, 24°W.

Description.—Arm suckers in two, closely packed series. Large arm suckers with ca. 12 broad, triangular teeth distally on inner rings, becoming low, blunt teeth proximally (Fig. 2k). Large suckers of lateral arms with outer rings 0.8 mm in diameter, apertures 0.5 mm in diameter. Arm I suckers smaller than lateral arm suckers. Arm IV suckers smallest, diameter 0.4 mm (outer rings), 0.23 mm (apertures). Arms with low protective membranes, often difficult to detect.

Tentacles thick, muscular (Fig. 1a). Club relatively small, slender, compact, without aboral keel (Fig. 2n, o). Distal third of club with suckers in four series, decreasing to one sucker near tip. Suckers absent from club tip which forms short cone covered with chromatophores. Proximally suckers not as regularly arranged, appear mostly in three series, decreasing to a single sucker at base and preceded proximally by a “carpus.” “Carpus” with 5 suckers in single zig-zag series; carpal suckers mostly larger than suckers of club proper and with relatively larger apertures. Suckers of club proper with broad outer rings and narrow apertures, apparently with smooth inner rings. Entire club, including “carpus,” bounded by thick protective membranes which appear to join distal to terminal sucker.

Head with large laterally compressed eyes with silvery rostra on ventral tips (Fig. 1a–c). Eyes bulge greatly from head laterally and ventrally, surrounded by thick, gelatinous layers that extend to lateral sides of head (Figs. 1a–c, 2m). Short brachial pillar present. Broad, deep excavation present between funnel adductor muscles. Bridles extend to mid-region of head, nearly to level of eye rostra. Olfactory organs posterolateral to eyes on long slender stalks.

Funnel locking-apparatus oval without tragus but with bilobed antitragus (Fig. 2d, e); lateral lobe of antitragus broader; low channel between lobes extends to edge of cartilage. Funnel valve

absent. Mantle thin, muscular, terminates at midlevel on fins. Fins with anterior lobes, posterior lobes uncertain due to damage. Tail unknown, missing on our specimens. Thick, triangular conus broken off at posterior edge of fins.

Photophores absent. Pigmentation consists of large reddish-brown chromatophores scattered over arms, head, funnel, mantle and fins (Fig. 1). Digestive gland oriented oblique to body axis.

Measurements.—Abbreviations: FL = fin length, FW = fin width, HL = head length, ML = mantle length, MW = mantle width. Neotype (specimen no. 1, immature female): ML – 60 mm, MW – 13 mm, FW – 36 mm, FL – 17 mm, HL (nuchal cartilage to posterior end of brachial pillar – 16.5 mm; Brachial Pillar width – 9 mm, Branchial Pillar depth – 7 mm, Head width (across eyes) – 14, Neck width – 13.5 mm, Neck length (collar to posterior eye margin) – 8 mm, Eye width – 10 mm, Eye depth – 12.5 mm, Head depth (midline at posterior edge of eyes) – 12 mm, Lens diameter – 5 mm. Specimen no. 2 (sex undetermined): ML – 70 mm (estimate), Club length – 11 mm, Club width – 2.2 mm, Diameter outer ring of large suckers of club proper – 0.3 mm, Aperture diameter – 0.06 – 0.08 mm. Large carpal suckers – 0.04 mm, Aperture – 0.14 mm.

Discussion

The type specimens of *P. levimana* lacked tentacles, and some additional important systematic characters were not included in the original description. Our specimens, besides coming from the region of the type locality, have features that generally agree with the type description, with a few exceptions. The exceptions and missing details, however, cannot be checked as the types are missing, according to a personal communication from O. Israelsson at the Zoologiska Museet, Uppsala University where the types are accessioned. Fortunately,

Table 1.—Comparison of certain characteristics of *Planctoteuthis* species.

	Arm IV suckers, number	Sucker dentition, arms I-III	Antitragus	Fin Length (% of ML)	Club Shape	Club Keel	Distribution
<i>P. danae</i>	12-13	7-9 distal truncated teeth	Double; lobes nearly equal	52%	Symmetrical	No	Tropical Pacific
<i>P. exophthalmica</i> = <i>P. levimana</i> ?	10	?	?	(width = 36% ML)	Symmetrical	No	South Indian
<i>P. levimana</i>	6-8	Broad truncate teeth all around	Double; lobes unequal	40%	Long, symmetrical	No	North Atlantic, tropical Pacific
<i>P. lippula</i>	25	>50 min teeth, distal larger	Single or slight double; low, broad	40-45%	Short, asymmetrical	Yes	Atlantic, tropical Pacific
<i>P. oligobessa</i>	2-4	25-35 blunt teeth, distal 0.67	Single; slender	23-33%	Symmetrical	No	Tropical Pacific

illustrations of the more intact type were made by an artist at the United States National Museum of Natural History many years ago. These illustrations, which we have located (Fig. 2f, g), show a peculiar shape to the antitragus of the funnel-locking cartilage (Fig. 2f). We were immediately struck by its similarity to that of our specimens (Fig. 2g, e). To determine the systematic value of the shape of the antitragus, we have examined the antitragus of as many species of *Planctoteuthis* as are available to us. We presently recognize five species in the genus (Table 1): *P. danae* (Joubin 1931), *P. oligobessa* (Young 1972), *P. levimana* (Lönnerberg, 1896), *P. exophthalmica* (Chun 1908) and *P. lippula* (Chun 1908). Pfeffer (1912) included *Chiroteuthis planctonica* in his subgenus *Planctoteuthis*. However, the absence of distinctly protruding eyes in his specimen, a 6.4 mm ML paralarva, suggests that his species belongs in *Chiroteuthis*. Of the species we recognize, the first three are known from subadults and the latter two from paralarvae. *Planctoteuthis oligobessa* has a distinct and simple antitragus of the form we previously thought to be typical of the genus (Fig. 2h). A subadult of *P. lippula* that we examined from the western North Atlantic has a low antitragus with just a hint of division into two lobes (Fig. 2i). *Planctoteuthis danae* has a double antitragus rather similar to, but more pronounced than, that of our specimens (Fig. 2j). These three species differ from our specimens in many other features as well. We examined several individuals of most species and found the form of the antitragus to be consistent. We conclude that the shape of the antitragus has strong value as a specific character and that it confirms the identification of our specimens as *P. levimana*.

Our specimens differ from the type description primarily in the dentition of the arm suckers. Lönnerberg (1896) describes the suckers as having inner rings

“...provided with broad truncate nearly square-cut teeth all around the aperture.” We found truncate teeth only on the proximal margin and they were smaller than the pointed teeth they merge with distally. Sucker dentition is often difficult to see, and this discrepancy could be inaccurate or it could represent individual variation. Indeed, our smaller specimen had about two-thirds the number of teeth on an arm sucker as the larger specimen. Since the type specimens are missing and the original description lacks essential details and may contain inaccuracies, we designate our specimen No. 1 as the neotype.

Nesis (1982–87) suggested that *P. lippula* Chun, 1908 may be the paralarva of *P. levimana*. The slender club lacking a keel of our specimen, however, is very different from that of *P. lippula*, but is similar to *P. exophthalmica*. *Planctoteuthis lippula* is certainly a valid species, as it is the only *Planctoteuthis* with keels on the clubs. A paralectotype of *P. exophthalmica* was taken by Chun in the North Atlantic (31°59'N, 15°5'W, 25 mm ML; Fig. 2a–c) with a distinct but eccentric antitragus which suggests that the secondary lobe of the antitragus was overlooked. We consider this specimen to be a paralarval *P. levimana*.

Acknowledgments

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