Paralarva of the sharpear enope squid
Ancistrocheirus lesueurii (Oegopsida: Ancistrocheiridae) in the southeastern Arabian Sea

K. K. Sajikumar*, N. Ragesh, K. P. Said Koya¹, V. Venkatesan, Mathew Joseph, R. Remya and K. S. Mohamed
Central Marine Fisheries Research Institute, P.B.No.1603, Ernakulam North, P.O., Kochi-682 018, Kerala, India
¹Central Marine Fisheries Research Institute, Calicut Research Centre, P.B.No.917, West Hill P.O., Kozhikode-673005, Kerala, India.
*Correspondence e-mail: kksajikumar@yahoo.co.in
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Abstract
First morphological description of an early stage paralarva of the sharpear enope squid Ancistrocheirus lesueurii from southeastern Arabian Sea is presented. The paralarva was collected at dusk by using surface tows of zooplankton nets in February 2012. The presence of paralarva A. lesueurii indicates that this species completes its life cycle in this sea. A comparison of the arm formula of paralarva and adult stages shows a major change in the formula during metamorphosis to adult.

Keywords: Ancistrocheirus lesueurii, Arabian Sea, Thelidioteuthis alessandrii, squid paralarvae, arm formula, Lakshadweep Archipelago, plankton.

Introduction
Ancistrocheirus lesueurii (d’Orbigny, 1842), the sharpear enope squid, is the only known species in the genus Ancistrocheirus and family Ancistrocheiridae. This mesopelagic squid occurs worldwide in tropical and temperate open ocean waters (Roper and Jereb, 2010). The records of adult specimens are extremely rare in comparison to other pelagic cephalopods and records are mainly found for juvenile stages (D’Ongbia, et al., 1992). Planktonic juveniles are found in upper mesopelagic waters (Clarke, 1966). Paralarval stages have been mainly recorded in plankton nets whereas adults are frequently recorded in the stomach contents of sperm whales (Clarke, 2006).

Earlier adult specimens were reported from Indian waters by Chun (1910), Roper et al. (1984) and Silas et al. (1985). Aravindakshan and Sakthivel (1973) recorded juveniles from the Bay of Bengal. Silas (1968) first reported paralarvae of A. lesueurii from the southeastern Arabian Sea and included a distribution map showing 12 locations of capture. However detailed descriptions were not given. The taxonomic history of this squid species is complicated and descriptions of paralarvae and early stages are limited.

Material and methods
Paralarva of A. lesueurii was collected in the zooplankton samples during targeted cruises conducted for exploration of the ommastrephid squid Sthenoteuthis oualaniensis (Lesse, 1830) (Ommastrephid) carried out by MV Titanic from September 2010 to March 2013. The study covered the oceanic waters from 8°N to 17°N latitudes and 64°E to 76°E longitudes along the eastern and central Arabian Sea at depths ranging from 300 to 4000 m. Sampling was conducted...
at 58 stations during this period. Squid were collected at dusk or at night with light attraction from oceanic fishing grounds with plankton nets (KC Denmark, Model 23.100-WP-2). The single paralarva was recorded from one station (10°38’N latitude, 73°46’ E longitude) on 21st February 2012 (Fig.1). Plankton samples were preserved in 5% formaldehyde following capture. Sorting and identification were done in the laboratory. Photographic images were taken with a Nikon zoom stereomicroscope (SMZ 1000). The pattern of chromatophores on the body could not be determined due to loss of colouration as a result of long term preservation in formaldehyde.

Synonyms: Onychoteuthis lesueurii d’Orbigny, 1842; Thelidoteuthis alessandrinii (Verany, 1847); Abralia megalops Verrill, 1882b; Enoploteuthis pallida Pfeffer, 1884; Enoploteuthis polyonyx Troschel, 1857.

Material examined
A single paralarva of A. lesueurii (CMFRI, DD.2.1.1.1) which was collected from the oceanic squid fishing ground in Arabian Sea (10°38’N; 73°46’ E) (Figs. 2 & 3).

Results and discussion
SYSTEMATICS
Order: TEUTHOIDEA Naef, 1916
Suborder: OEGOPSIDA d’Orbigny, 1845
Family: ANCISTROCHEIRIDAE Pfeffer, 1912
Ancistrocheirus lesueurii d’Orbigny, 1842

Fig.1. Map of the study area showing sampling stations, closed circle indicates the site where A. lesueurii was caught, open circles indicate all stations sampled but with nil records during 2009-2013

Description
The specimen examined agrees well with earlier descriptions of paralarvae. The arm apparatus is well developed, except for the short, ventral arms which form only short stumps and blunt posterior. The arm formula is II > III > I > IV. Each arm bears suckers; arm suckers large and few in numbers; suckers absent on the proximal sections of arms as also observed by Vecchione et al. (2001). Transformation of suckers into hooks not observed (Fig.3). Mantle rounded, cup-shaped; fins small, weakly muscular. Tentacles long, robust, without photophores.
Paralarva of the sharpear enope squid in the southeastern Arabian Sea

The paralarva had a total length of 3.56 mm and a dorsal mantle length of 1.67 mm. Arms well developed except arm pair IV. The ventral arms were very small with a blunt posterior end. Funnel cartilage long. Eyes protrude. Suckers on arms and tentacular clubs were well developed, relatively large with 16 suckers present on tentacular clubs. The adult arm formula has been reported as III>IV=II>I (D’Onghia et al., 1997). A comparison of arm formula between paralarva and adult shows a major change in the formula during metamorphosis to adult. The main change is with respect to arm II, I and IV.

Morphometric indices related to mantle length were higher for total length and tentacle length (213.17 and 105 respectively). A lowest index was observed for the ventral arm pair (14.9) (Table 1).

The paralarva was seen close to the surface layer and it was observed near the Lakshadweep Archipelago which must be very close to the site where they hatched indicating that this species spawns around the archipelago. Silas (1968) also observed paralarvae of A. lesueurii near the edge of the continental shelf and around the Lakshadweep Islands during the research cruises of R V Varuna. He recorded the presence of 12 paralarvae A. lesueurii in 2363 plankton hauls from January 1962 to May 1965. In the present instance only one positive record was made out of 58 stations from September 2010 to March 2013 indicating the rarity of the species in the habitat.

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References


