

First Record and Range extension of *Clavellisa ilishae* Pillai, 1962 (Copepoda, Siphonostomatoidea, Lernaeopodidae) Parasitizing *Nematalosa nasus* (Bloch) (Clupeiformes: Dorosomatidae) from Khor Al-Zubair Lagoon, Southern Iraq

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Abstract

Bloch's gizzard shad *Nematalosa nasus* (Bloch) is a member of the dorosomatid fish which, is considered a typical host of a lernaeopodid copepod, however, no parasitological investigation on this host with respect to this group of parasite has been conducted in the Arabian Gulf. A survey of gill's parasite is carried out in June 2026 revealed that two of the 33 examined fish were infected with a copepod attached to the gill rakers. This copepod belongs to *Clavellisa ilishae* Pillai, 1962. Illustrations of the parasite are provided and compared with previous records from other geographical regions. This represent the first record of *C. ilishae* from the Arabian Gulf and extends its known geographical distribution from Arabian Sea to the northwestern Arabian Gulf.

Key words: Arabian Gulf, Gill rakers, Marine fish, Parasitic Copepod.

Introduction

Bloch's gizzard shad *Nematalosa nasus* (Bloch) is widely distributed throughout the Indo-West Pacific, ranging from the Gulf of Aden northward to the Persian (=Arabian) Gulf, and eastward through the Andaman Sea, South China Sea, and the Philippines, extending as far north as the southern coast of Korea (Froese and Pauly, 2026).

The family Lernaeopodidae Milne Edwards, 1840 is one of the siphonostomatoid copepods, comprises 54 genera (Walter and Boxshall, 2026). Members of this family are very successful group of parasitic copepods in possessing unique modified second maxillae fused with an anchoring device, known as the bulla (Kabata, 2003).



Lernaeopodidae represented by seven species or taxa from marine fishes off Iraq (Mhaisen *et al.*, 2018): *Alella* sp. and *Clavellotis* sp. from *Acanthopagrus arabicus* Iwatsuki (Adday, 2013); *Clavella adunca* (Strøm, 1762) from *Hilsa ilisha* (= *Tenuwalosa ilisha* [Hamilton]) (Al-Daraji, 1995); *Clavella* sp. from *Ilisha compressa* Randall (misidentified as *I. elongata*) from Khor Al-Zubair lagoons (Piasecki *et al.*, 1993); *Clavelloopsis appendiculata* Kirtisinghe, 1950 (Reported as *Isobranchia appendiculata* Heegaard, 1947) from *Chirocentrus nudus* Swainson; *Clavellotis bilobata* (Pillai, 1962) from *Nemipterus japonicus* (Bloch) and *Pseudocharopinus* sp. from *Chiloscyllium arabicum* Gubanov (Adday, 2013).

Clavellisa Wilson C.B., 1915 currently comprises 12 valid species, with the exception of *C. emarginata* (Krøyer, 1837) and *C. scombri* (Kurz, 1877), all species are parasite of five families of clupeiform fishes; *Clavellisa chinensis* Yü, 1933 parasitized two engraulid species: *Coilia grayii* Richardson, in China (Yü, 1933) and *Coilia nasus* Temminck & Schlegel in Korea (Moon, 2019); *C. cordata* Wilson C.B., 1915 has been reported from the alosids, *Alosa mediocris* (Mitchill) and *A. pseudoharengus* (Wilson) in Woods Hole, Massachusetts, USA (Wilson, 1915), and from *A. aestivalis* (Mitchill), *A. pseudoharengus* and *A. sapidissima* (Wilson) in Canada (Rubec and Hogans, 1987), and pristigasterid *Ilisha melastoma* (Bloch & Schneider) (reported as *Platygaster indica*) in India (Pillai, 1962).

The latter record was considered as misidentification (Boxshall, Pers. Comm.); *C. dorosomatis* Yamaguti, 1939 parasite dorosomatid fishes in Japan: *Dorosoma thrissa* (= *Clupanodon thrissa* [L.]) (Yamaguti, 1939) and *Konosirus punctatus* [Temminck & Schlegel] (Do and Ho, 1983) and in Korea (Kim, 1998); *C. dussumieriae* Gnanamuthu, 1948 has been reported from dussumierid fishes in India: *Dussumieria acuta* Valenciennes (Gnanamuthu, 1948) and *D. hasseltii* Bleeker (Pillai, 1962). *C. emarginata* (Krøyer, 1837) is a parasite of anarhichadid *Anarhichas lupus* Linnaeus from East Atlantic and Mediterranean Sea (Kabata, 1979). *C. ilishae* Pillai, 1962 parasitized pristigasterid *I. filigera* (Valenciennes), *Euplatygaster indica* (= *I. melastoma* [Bloch & Schneider]) and dorosomatid *Tenuwalosa ilisha* (Hamilton) in India (Pillai, 1962); *C. obcordata* Rangnekar, 1957 parasitized dorosomatid *Chatoessa nasus* (= *Nematalosa nasus* [Bloch]) (Rangnekar, 1957) and engraulid *Thrissocles malabaricus* (= *Thryssa malabarica* [Bloch]) in India (Tripathi, 1962).

The latter record was considered a misidentification of the *C. emarginata* by Kabata (1979) and subsequently with Tripathi (1985); *C. pellone* Tripathi, 1962 is parasite of *I. filigera* and *I. melastoma* in India (Tripathi, 1962); *C. phasa* Tripathi, 1962 is parasite of two engraulid fishes *Coilia dussumieri* Valenciennes and *Setipinna phasa* (Hamilton) in India (Tripathi, 1962); *C. pomolobi* (Fowler, 1912) is parasite of alosid fishes: *Pomolobus aestivalis* (= *Alosa aestivalis* [Mitchill]) and *Pomolobus pseudoharengus* (= *Alosa pseudoharengus* [Wilson]) in Pennsylvania, USA (Madinabeitia and Nagasawa, 2011); *C. scombri* (Kurz, 1877) is parasite of scombrid fish: *Scomber scombrus* L. from Atlantic, off South-western Africa, North Sea, Mediterranean Sea and Japan (Kabata, 2003) and a type

species *C. spinosa* Wilson C.B., 1915 parasite of alosid *Brevoortia tyrannus* (Latrobe) from Western Atlantic, USA (Wilson, 1915).

The aim of the present study is to isolate and redescribe an interesting and rare copepod parasite of gill rakers of Bloch's gizzard shad *Nematalosa nasus* (Bloch), from Khor Al-Zubair lagoon, southern Iraq.

Materials And Methods

A total of 33 specimens of Bloch's gizzard shad, *Nematalosa nasus* (Bloch), ranging from 111 to 140 mm in total length and weighing 24–32 g, were collected from Khor Al-Zubair Lagoon in May 2026. In the laboratory, the fish were examined for ectoparasites within 48 hrs after catching. The gill arches were removed and placed individually in Petri dishes, then carefully examined under an Optika S2-ST1 dissecting microscope. Recovered parasites were cleaned and immersed in 90% lactic acid before being transferred to a glass cavity slide overnight for clearing (Adday *et al.*, 2026).

Morphological illustrations of the parasites were prepared using a camera Lucida attached to a Leica compound microscope. The voucher specimens were deposited in the Department of Fisheries and Marine Resources, College of Agriculture. All measurements are taken in micrometres (μm).

Results

Description of 2 adult females

The body consist of three regions. Head, long cephalothorax and trunk. The body 1973-2286 (2129) in length. Cephalothorax (Fig. 1A) is extremely elongated, about 4.04-4.25 (4.15) times as long as the trunk. Trunk, unsegmented (Fig. 1), elliptical in shape, 1.83-1.85 (1.84) times (359×661) wider than long with rounded posterior corners. Antennule (Fig. 1B), three-segmented; proximal and second segments armed with a seta; distal segment with slightly tapering tip and an apical armature consisting of four setae and four elements. Antenna (Fig. 1C) biramous, elongate; exopod prominent and longer than endopod, the exopod armed with two sub-equal outer setae; endopodal lobe armed with 2 setae and rounded rim of digitiform element. Mandible small, with subapical marginal teeth (Fig. 1D).

Maxillule (Fig. 1E) with two lobes, the large inner lobe with three unequal setae with broad base; the small outer lobe with convex dorsal margin possessing two setae. Maxilla (Fig. 1H) creating arms acting as primary attachment organ; each maxillary arm extremely short, tapering and nearly opposed to opposite member, but clearly separate; bulla ovoid (arrow in Fig 1H). Maxilliped (Fig. 1F) subchelate with robust corpus, covered by thick, wrinkled cuticle and a single seta on ventromedial side; slender subchela curved with a single seta on ventral margin and a row of spinules along ventral margin of the base; Small claw with accessory barb.

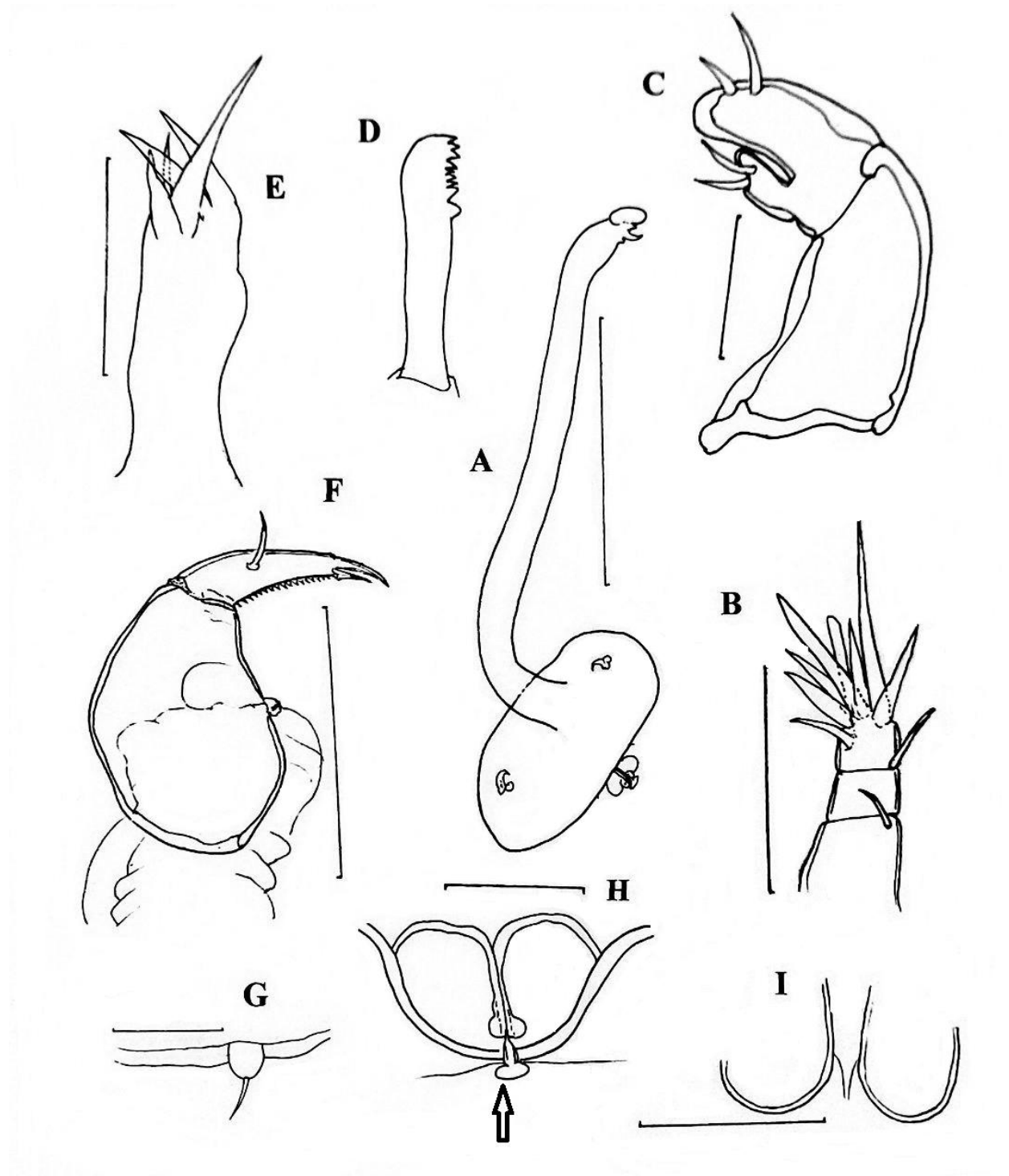


Figure (1): *Clavellisa ilishae* Pillai, 1962 adult female. A: habitus, lateral; B: antennule; C: antenna; D: mandible; E: maxillule; F: maxilliped; G and I: anal laminae; H: maxilla and bulla. Scale bar: 100 μ m in A, 25 μ m in B-I).

Discussion

The two female specimens of copepod each has a vestigial posterior process, genital process is smaller than cephalothorax; base of cephalothorax is close to centre of dorsal surface of trunk; which agree with the definition of *Clavellisa* Wilson, 2015 (Kabata, 2003). *Nematalosa nasus* is known to serve as a host for two species of *Clavellisa*, namely *C. ilishae* and *C. obcordata*. The present specimens are consistent with the description of *C. ilishae* rather than the *C. obcordata*, based on the length of the cephalothorax (1375-1606 vs 4700), the ratio of trunk length to maxilla length (7 vs 0.93 times), the shape of the trunk (longer than width vs wider than length). It is worth noting that Rangnekar (1957) regarded the absence of a bulla in *C. obcordata* as one of its diagnostic characters, however, R. Castro (Pers. Comm.) considered this feature to be characteristic of the family Lernaeopodidae as a whole; suggesting that the bulla in his specimens may have been lost during the removal of the copepod from the host.

Clavellisa ilishae has been reported from three different families of Clupeiform fishes (Table 1), namely Dorosomatidae, Pristigasteridae and Alosidae. It has recorded from dorosomatid *T. ilisha* from India (Pillai, 1962; Tripathi, 1962) and Pakistan (Batool *et al.*, 2019); the dorosomatid *Sardinella brasiliensis* (Steindachner) from Brazil (Moreira *et al.*, 2013) and *S. aurita* Valenciennes from Egypt (El-Rashidy and Boxshall, 2010); the pristigasterid *Ilisha filigera* and *I. melastoma* in India (Pillai, 1962), and the alosid *Sardinops ocellata* (= *S. sagax* [Jenyns]) from South Africa (Kensely and Grindley, 1973).

Table (1): Comparison some morphological characters of *Clavellisa ilisha* with previous studies.

Host	Cephalothorax µm	Trunk length µm	Trunk width µm	Locality µm	Reference
<i>Ilisha filigera</i> , <i>I. melastoma</i> , <i>Tenuulosa ilisha</i>	1900	600	1000	India	Pillai, 1962
<i>Sardinops ocellata</i> (= <i>S. sagax</i>)	1500-2000	-	800-1000	South Africa	Kensely and Grindley, 1973
<i>Sardinella aurita</i>	2000-2750	500-730	730-1060	Egypt	El-Rashidy and Boxshall, 2010
<i>Sardinella brasiliensis</i>	1170-3120	550-1070	870-1500	Brazil	Moreira <i>et al.</i> , 2013
<i>Tenuulosa ilisha</i>	1030-1040	300-310	470-480	Pakistan	Batool <i>et al.</i> , 2019
<i>Nematalosa nasus</i>	1375-1606	340-378	624-699	Iraq	Present study

Tripathi (1962) described *Clavellisa hilsae* Tripathi, 1962 from *Hilsa ilisha* (*T. ilisha*) from India. Kabata (1979) subsequently regarded *C. hilsae* as a junior synonym of *C. ilishae*, citing the absence of the morphological differences between the two species. Later, El-Rashidy and Boxshall (2010) discussed this taxonomic issue and, followed Vervoot (1986) recognition of the priority over *C. hilsae* based on their respective publication date, as *C. ilishae* was published in April 1962, whereas *C. hilsae* was published in July 1962.

The present article represents the first record of *C. ilishae* from the Arabian Gulf and extends its known geographical distribution from the Arabian Sea to the northwestern Arabian Gulf.

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أول تسجيل وتوسيع نطاق انتشار القشري *Clavellisa ilishae* Pillai, 1962 (Copepoda, Siphonostomatoidea, Lernaeopodidae) المتطفل على سمكة الجفوة الخيطية *Nematalosa nasus* (Bloch) (Clupeiformes: Dorosomatidae) من خور الزبير، جنوب العراق.

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المستخلص

تعد سمكة الجفوة الخيطية *Nematalosa nasus* (Bloch) من أسماك العائلة Dorosomatidae، التي تعتبر مضيفاً نموذجياً لمجذافية الاقدام من عائلة Lernaeopodidae، مع ذلك، لم تُنجز أي دراسة طفيلية على هذا السمكة من هذه المجموعة من الطفيليات في الخليج العربي. كشف مسح أجري لطفيليات غلاصم هذه السمكة خلال حزيران 2026، ان سمكتين من أصل 33 سمكة تم فحصها كانتا مصابتين بهذا النوع من مجذافية الاقدام ملتصقة بالأمشاط الغلصمية.

ينتمي هذا القشري إلى النوع *Clavellisa ilishae* Pillai, 1962. وضحت اجزاء الطفيلي التفصيلية برسومات توضيحية وقورنت بالتسجيلات السابقة من مناطق جغرافية أخرى. يُمثل هذا أول تسجيل لـ *C. ilishae* في الخليج العربي، ويوسع نطاق انتشاره الجغرافي المعروف من البحر العربي إلى شمال غرب الخليج العربي.

الكلمات المفتاحية: الخليج العربي، الاسنان الغلصمية، الاسماك البحرية، مجذافية الاقدام المتطفلة.