

**A FIRST RECORD OF *ANURETES SIMILIS*(HO& LIN, 2000)CALIGIDAE:
POECILOSTOMATIDEA PARASITIC ON SILVER GILVER *PLECTROINCHUS*
SORDIDUS (PLECTORI: PISCES) FROM NORTHWEST OF ARABIAN GULF, IRAQ**

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ABSTRACT

The copepod *Anuretes similis*(Ho & Lin, 2000) was found attached to the gill filaments of fishes related to the genus *Plectroinchus sordidus* which were collected from northwest of the Arabian Gulf during the period October 2013 to July 2014. The species was recorded for the first time in Iraqi territorial waters of the Arabian Gulf and *P. sordidus* was new host record for this parasite in the Arabian Gulf. This copepod was confirm taxonomically by Prof. Dr. Geoffrey A. Boxshall, British Natural History Museum, U.K. and put it as a voucher specimen in the museum under the: Reg. No. NHMUK 2014.54-55

KEYWORDS: *Anuretes*, copepod, fish, Plectori, *Plectroinchus sordidus*. This research part of M. Sc. Thesis for Hayder A. AL-Hasson

INTRODUCTION

Plectorhinchus sordidus (Klunzinger 1871) belongs to the subfamily Plectorhinchinae. Its geographical distribution extends from the Arabian Gulf, Red Sea, Indian Ocean to China (Kuronuma and Abe, 1986). Most fishes in wild or cultivated population exposed to many problems including competition, parasitism and predation (Nikolsky, 1963). *Anuretes* was established by Heller (1865) to accommodate species in the family Caligidae (Burmeister, 1835) that lack a well-defined abdomen, within the group of genera without lunules on the paired frontal plates, One difficulty with the generic concept has been that the degree of reduction of the abdomen is variable, in some species a small but distinct abdomen is present, whereas in others the abdomen is fully incorporated into the genital complex and the caudal rami appear to originate directly from its surface (Venmathi Maran and Ohtsuka, 2008). Shiino (1954) discussed the status of *Anuretes* and concluded that it had been used as a waste basket for those species which could not be placed in *Lepeophtheirus*(von Nordmann, 1832). Yamaguti (1963) retained *Anuretes* as a distinct genus and erected a new subfamily to

accommodate it together with *Pseudanuretes* (Yamaguti, 1936). Ho and Dojiri (1977) pointed that the overlap between these two genera and recommended treating the species of *Anuretes* as members of *Lepeophtheirus*. However, it was Dojiri (1983) who resurrected *Anuretes* and distinguished it from *Lepeophtheirus* by a combination of six different characteristic features. The character state noted by Pillai (1967) that a pinnate seta is located on the surface between the two bifurcate distal spines on the terminal exopodal segment of leg 1. Finally, *Anuretes* was re-instated as a valid genus by Ho and Lin (2000), who provided a key to the 19 species recognized at that time, and this proposal was followed by Boxshall and Halsey (2004). Adday (2013) described two types of parasite in Iraqi territorial waters: *Anuretes branchialis* and *A. anomalus*.

The aim of this study was focusing and detect the ectoparasites copepods which can be found in species of marine fishes of Perciformes order from arabian gulf.

Materials and Methods

A total of 239 fishes specimens related to different genera of order Perciformes were examined during the period from October 2013 to July 2014 and 6 of them related to the genus *Plectroinchus sordidus* were examined for ectoparasites and endoparasites infection. They were captured from Iraqi territorial waters, northwest of the Arabian Gulf (latitudes 47° 30', to 48° 15'; longitude 30° 50' to 30° 00').

The fishes were transported to the laboratory of Parasitology at Department of Fisheries and Marine Resources, College of Agriculture, University of Basrah, which copepod parasites were removed from the gill filaments and put in 70% ethyl alcohol. after dissection, the copepods were cleared in 85% lactic acid using the wooden slide method (Humes and Gooding, 1964). Measurements were made using an ocular micrometer. Drawing were made using a camera Lucida.

Copepods were identified on the basis of their morphological features according to Kabata (1979), Pillai, (1967) and Yamaguti, (1963). Some specimens were sent to Prof. Dr. Geoffrey A. Boxshall, Department of Zoology, London for confirmation the taxonomy.

Results

Five specimens of copepod of *Anuretes similis* was found attached to the gill filaments of *P. sordidus* (Table 1).

Family: Caligidae

Order: Siphonostomatoida.

Host: *P. sordidus*

Site of infection: Gill

Locality: Northwest Arabian Gulf within the Iraqi territorial waters.

Material deposition: Voucher specimens were deposited in the Natural History Museum, London accessions NHMUK 2014. 54-55.

Description female body: (Fig. 1A) 1.36 (1.50-1.98) mm long, excluding setae on caudal rami. Cephalothoracic shield longer than wide, 0.88 (0.92-1.06) × 0.82 (0.74-0.92)mm, excluding marginal hyaline membrane. Fourth pediger, 0.09 × 0.16 mm, only partially covered by free margin of cephalothorax. Genital complex usually slightly longer than wide, 0.45 (0.58-0.90) × 0.58 (0.56-0.92) mm. Abdomen (Fig. 3C) much reduced, represented by reduced, bilobate anal somite located at end of genital complex. Caudal ramus (Fig. 3F) small, longer than wide, 64 (24-28) × 80 (16-24) µm, carrying 3 short and 3 long plumose setae. Egg sac 0.92 (0.76-1.93) mm long, containing as many as 11 eggs. Armature on rami of legs 1-4 as follows (Roman numeral indicating spines and Arabic numeral, setae):

Exopod Endopod

Leg 1 1-0; III,1,3(vestigial)

Leg 2 I-1; I-1; II,I,50-1; 0-2; 6

Leg 3 I-0; 90-0; 6

Leg 4 I-0; III (missing)

Table 1.The number of examined, infected fishes Silver Gilver *Plectroinchus sordidus* with prevalence and intensity of infection with copepoda *Anuretes similis*.

No. of examined Fish	No. of infected Fish	Fish length (cm)		Fish weight (gm)		Parasite prevalence (%)	Mean Parasite intensity
		Mean	±SD	Mean	±SD		
6	5	34	5	528	299	83.3	1

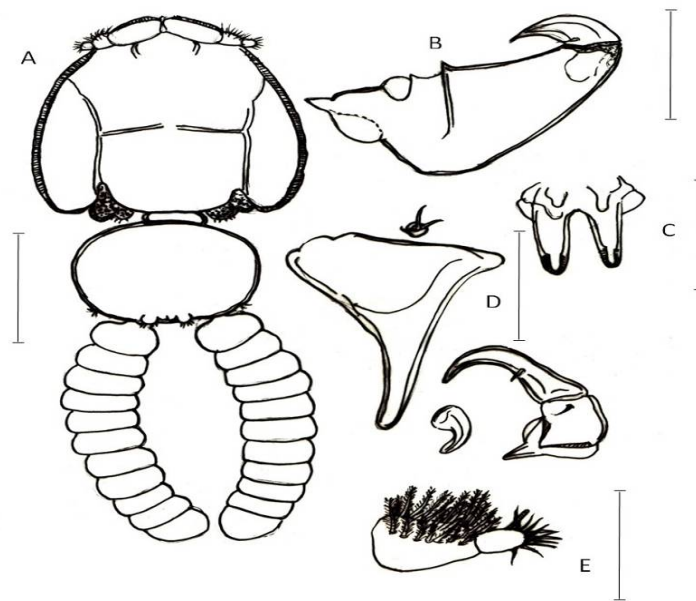


Fig (1). *Anuretes similis*, Female, A: habitus, dorsal; B: maxilliped; C: Sternal furca; D: maxillule; E: antennule; (post antantennal process) (Scale bars 1.3 in A; 0.1 in B,C,D,E).

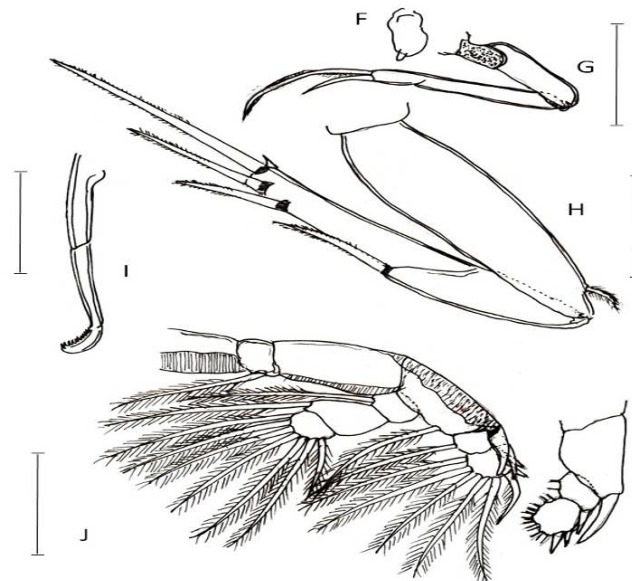


Fig (2). *Anuretes similis*, Female A: maxillary whip; B: maxilla; C: leg 4; D: mandible; E: leg 2; (Scale bars 0.1 in F,G; 0.04 in H,I,J).

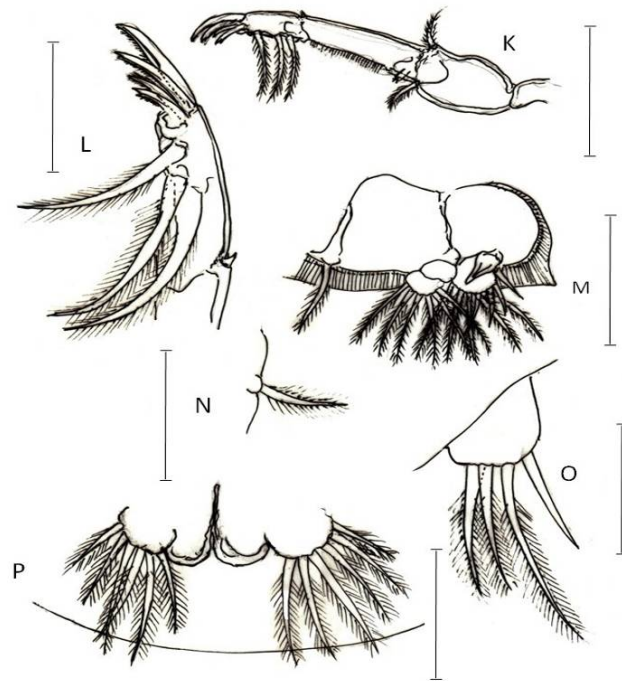


Fig (3). *Anuretessimilis*, Female A: leg 1 tip of leg 1 exopod; B ; C: leg 3; D: leg 5; E: leg 6; F: caudal rami(Scale bars 0.04 in K,L,O,P; 0.1 in M,N); D; E post antennal process; F: Antennule; G: Maxillule.

Discussion

In 1863 when Henrik Krøyer described *Lepeophtheirus heckelii* found on the spadefish (*Ephippusgigas*) from Brazil and New Orleans, Louisiana, he noticed the copepod bearing a vestigial abdomen and commented that this unusual feature might warrant the creation of a new genus for *L. heckelii*. Krøyer's (1863) was adopted by Heller (1865) who proposed a new genus *Anuretes* to accommodate *L. heckelii* (Ho and Lin, 2000).

A new species of caligid copepod (Siphonostomatoida), *Anuretes grandis* sp. n., parasitic on the painted sweet lips *Diagrammapietum* (Thunberg)] in Taiwan is described by Ho and Lin (2000), the new species is distinguished from its congeners by having: (1) free margin of cephalothorax not covering fourth pediger, (2) large genital complex longer than 2/3 of the cephalic shield, (3) no maxillary whip, (4) leg 3 with 9 setae on the terminal segment of exopod and 8 plumose setae on the terminal segment of endopod, and (5) armature of I, III on leg 4 exopod.

A. similis is related to the physical characteristics and also known as a copepod, a kind of zooplankton, no single character unites all the members, maxillopoda includes barnacles, copepods and a number of related animals, a crustacean (crabs, lobsters, crayfish, shrimp, krill and barnacles), body sediment into the cephalon or head, the thorax, and the pleon or abdomen, has hard exoskeleton which is molted during growth, majority have separate sexes, a small number are hermaphrodites, have a number of larval forms(Chad, 2014).

A new species of caligid copepod, *A. justinein* sp., is described from off New Caledonia, It is parasitic on the gill filaments of a haemulid fish, the yellow banded sweet lips *Plectorhinchus lineatus* (Linnaeus), the new species is distinguished from its congeners by the combination of the following character states: (1) the fourth pedigerous somite is covered dorsally by the expanded free posterior margin of the cephalothorax; (2) a maxillary whip is present; (3) the relatively small genital complex is less than half the length of the cephalothorax; (4) leg 3 is armed with nine setae on the terminal exopodal segment and six setae on the terminal endopodal segment; and (5) leg 4 is long and slender with a setal armature of I, III twisted spines (Venmathi Maran *et.al.*, 2007).

Metacaliguslatus n. sp. (Copepoda: Caligidae) is described from specimens found parasitic in the oral and gill cavities of the cutlass fish, *Trichiuruslepturus* Linnaeus, caught from the Strait of Taiwan and landed at Dong-Shih Fishing Port in Chiayi County, Taiwan, It is close to *M. uruguayensis* (Thomsen, 1949), but can be distinguished from the latter by the possession of shorter caudal rami in both sexes and wider cephalothorax and genital complex in the male (Ho and Lin, 2002)

A. anomalus found in Iraq territorial waters of the Arabian Gulf, Cephalothorax slightly longer than wide excluding marginal hyaline membrane, fourth pediger wider than long, partially covered by free posterior margin of cephalothorax. Genital complex slightly wider than long, Abdomen reduced represented by small bilobate and somite, at the end of the genital complex, Caudal ramus slightly wider than long carrying three short and three long plumose setae(Adday, 2013).

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