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NEW RECORD OF TWO COPEPOD PARASITES FROM FRESH WATER FISHES OF SINDH, PAKISTAN

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Abstract

A crustacean ectoparasite, *Lamproglena chinensis*, (Yu, 1937) (Copepoda: Lernaeidae) has been found attached on gill filaments of a fresh water fish, *Channa striata* (B1.), collected from Keenjhar lake (Distt. Thatta), Sindh. Three female speciemens with ovaries were examined. This parasite has earlier been reported from South East Asia (China, Japan and Thailand). The new record from Pakistan extends its distribution across the Indian peninsula.

The fish lice, *Argulus bengalensis* (Ramakrishna, 1951) is recorded for the first time from Pakistan. The parasite was found on the body surface of a cyprinid fish, *Cirrhinus reba* (Baloch) from Manchhar lake (Distt. Dadu), Sindh. Five specimens, including males and females were studied. Males are slightly smaller than females in terms of carapace and abdominal lobes.

Keywords: Gill parasite, ectoparasite, Argulus, Lamproglena

1. Introduction

Among crustaceans, more than 1500 species of copepods are parasitic on fish. The gill parasites such as *Ergassilus*, *Lamproglena* and *Salmincola* damage the gill surface by their attachment and feeding activity. The injury to tissue can become the site of inflammation and secondary infection by microbes. If the infection is high, these parasites can cause great damage to population of fish in pond culture and cage culture systems (Yambot and Lopez, 1997; Nakajima *et al.*, 1974; Sutherland and Wittrock, 1985).

Fish lice belonging to family Argulidae are skin parasites. About one hundred known species have world wide distribution (Kabata, 1985). Fish lice cause damage to skin epithleum by their feeding activity. The wounds bleed slowly and become the sites of secondary infection by pathogens (Kabata, 1970). The argulids mostly parasitize the fresh water fish but few have been reported from marine fish (Devraj and Ameer Hamza, 1978, Cressey, 1978). Earlier, 10 species of fish lice have been reported from India (Natrajan, 1982), while only two species, *A. indicus* and *A. japonicus* have been reported from Pakistan (Jafri and Ahmed, 1999). Recently *A. japonicus* has been reported (Kazmi, 2003) from a gold fish in an aquarium.

In Pakistan, information about these parasites is meager. Jafri (1995) described *Ergassilus pakistanicus* from gills of spiny eel, *Mastacembelus armatus.* Similarly *Lernae multilobosa* has been reported from the skin of a cyprinid fish, *Salmostoma bacaila* (Jafri and Mahar, 2003). Present paper reports the new records of two parasites from freshwater fish of Sindh, Pakistan.

2. Materials and Methods

12 specimens of a snake-head fish, *Channa striata* were brought from Keenjhar lake (Distt: Thatta). These fishes were examined for ectoparasites. Two fishes were found to be infected with copepod parasites. *Lamproglena* were found attached on gill filaments. The parasites were carefully removed with the help of needle and soft brush, under a low power binocular microscope and preserved in 5 % formalin.

The specimens of fish lice collected from body surface of cyprinid fish, *Cirrhinus reba* obtained from Manchhar lake (Distt. Dadu), were preserved in alcohol and then transferred to 2% Formalin for detailed study. Preserved specimens became white in colour. Drawing was made with the help of camera lucida.

Results

Family: Lernaeidae

***Lamproglena chinensis* (Yu, 1937)**

Syn: *Lamproglena ophiocephali* (Yamaguti, 1939).

Five female parasites were collected. Two specimens were without ovisacs.

Measurements (mm): Total length: 3.23; Cephalothorax length: 0.17; Trunk length: 1.02; Trunk width: 0.61; Genital segment length: 0.32; Genital segment width: 0.34; Abdomen length: 1.7; Abdomen width: 0.25; Ovisac length: 2.5.

Cephalothorax: In adult female, cephalothorax longer than wide and includes the first thoracic leg. Cephalothorax separated from trunk by deep constriction **(Fig.1A).** Another constriction separates the anterior and posterior portion of cephalothorax.

Trunk: Trunk unsegmented externally, oval in shape, twice longer than wide. Trunk length 1/3 of total length. Four pairs of thoracic legs located on trunk. First pair of legs is located at the junction of cephalothorax and trunk. 5^{th} leg is present on a separate small segment of the trunk.

Genital segment: Genital segment, slightly wider than long and bears a pair of oblong shaped seminal receptacles. A pair of long ovisaces attached in gravid females. These contain oblong shaped, uniseriate eggs. **(Fig.1A)** Length of ovisac varies according to the number of eggs present. 18–30 eggs ovisacs of various females.

Abdomen: Abdomen three segmented, length about half of total body length, length about seven times of width. First two segments together are less than the length of last segment, last segment narrower than the first two, last abdominal segment slightly bilobed and bears a pairs of caudal ramii. Tips of ramii slightly tapering. Each rami has a small conical spine and seta **(Fig.1A).**

Appendages: First antenna, uniramous and unsegmented, bears a few setae on outer margin. Second antenna poorly developed. Mouth parts cyclopoid type. First maxilliped, one segmented stout, with a prehensile claw, second maxilliped, strong, two segmented and prehensile, terminal segment bears four claw like spines which are sub equal in size **(Fig. 1B)** outer spine is the largest, 2^{nd} , 3^{rd} and 4^{th} spines are gradually smaller in size. All spines are slightly curved.

Thoracic legs: Four pairs of biramous legs present, 5^{th} legs uniramous. Exopod and endopod of legs 1–4, two segmented, exopod with small terminal spines and few short setae, while endopod bears a row of short spines on inner margin. 5^{th} leg has a slightly bilobed basipod. Outer lobe bears a long seta, while the inner lobe has two short setae **(Fig. 1C).** A small spine is also present on the basipod.

Family: Argulidae

***Argulus bengalensis* (Ramakrishna, 1951)**

Body length 5.3 mm (female), 5.0 mm (male); Carapace subovate in female, oval in male **(Fig. 2A),** longer then wide (4.5 × 4.32 mm); abdomen wider than long (1.35 × 1.56 mm) in female, in male abdomen longer than wide (1.3×1 mm).

Respiratory areas banana shaped **(Fig. 2B).** Posterior respiratory area much smaller, located in the inner curve of anterior area; maxiliped stout with granulated surface, basal segment having three obtuse spines, last pair of thoracic leg in female bears notatory lobe, having a rounded portion and a pointed curved spine; 3^{rd} pair of thoracic leg in males bears a large adhesive disc on ventral side, while the 4^{th} pair has a small rounded adhesive disc on dorsal side.

3. Discussion

Only 20 species of genus *Lamproglena* have been reported from all over the world, out of these 10 are recorded from Africa, 2 from China, 3 from Russia, 3 from Thailand, 1 from Japan and 1 from Eastern Europe (Yamaguti, 1985). Yambot and Lopez (1997) have reported the infestation of *L. monodi* on gills of *Oreochromis niloticus* from Philippines. Kabata (1985) reported the presence of four species of these parasites from tropical

fishes. *L. inermis* from gills of *Bralias harmandi*; *L. minuta* on gills of *Puntius binotatus*, *L. robusta* on gills of *Liocassius bicolor*. Each species has been reported only once from a single host from Thailand. Type species *Lamproglena pulchella* (Nordmann, 1832) was reported on *Cyprinus jises*. Later, this parasite was reported on 12 host species of fish from various countries of Eastern Europe. Female of *L. pulchella* is reported to be 4-5 mm long. In *L. curta* the female is only 0.9-1.0 mm in length (Host: *Hemibarbus maculates*) (Gussev, 1950). *Lamroglena chinensis* (Yu, 1937) was reported on the gills of *Ophiocephalus argus*, *Anabas testudineus* and *Bralius harmandi* from China, Thailand and Japan. Total length was reported as 2.9-4.5 mm. Yamaguti (1939) referred this species as *L. ophiocephali* from Japan.

The present new record of *L. chinensis* from Pakistan (Host: *Channa striata*) is in fact the first record of this copepod genus from Indian sub-continent and so the distribution of this parasite is now extended up to the western limit of this region.

Very little information is available regarding the taxonomy of copepod parasites of fresh water fishes of Pakistan. Excellent reviews on systematics of argulids are available from other parts of the world (Yamaguti, 1985; Fryer, 1982; Kabata, 1988; Lester and Rauble, 1995). *Argulus indicus* and *A. japonicus* were reported earlier from Pakistan (Jafri and Ahmed, 1991) and later *A. japonicus* has been reported (Kazmi, 2003) from a gold fish in an aquarium.

The earlier record of *A. japonicus* from Pakistan has now been redesignated as *Argulus sindhensis* sp. nov. after the study of several speciemens of this new species (Jafri and Mahar, 2008). Record of *A. bengalensis* from Sindh is an addition to already available information regarding the crustacean ectoparasites of freshwater fishes of Pakistan.

Fig. 1. *Lamproglena chinensis,* A. Female, (Ventral view) B. 2nd Maxillapede, C. 5th leg

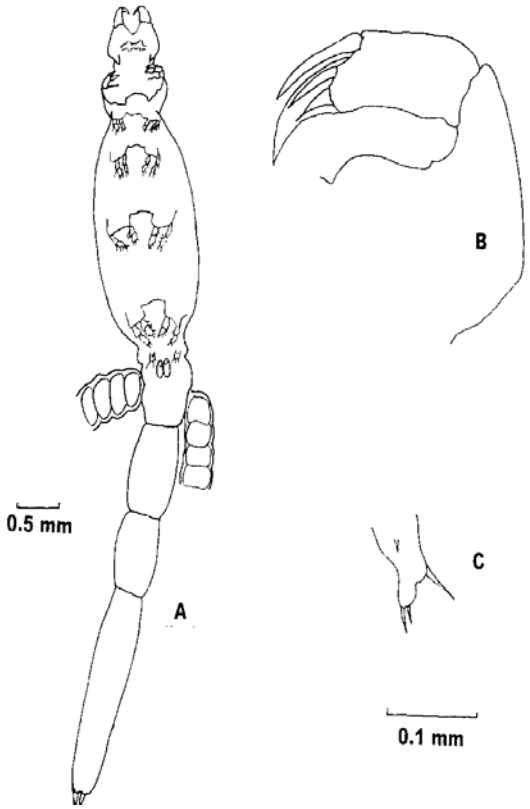
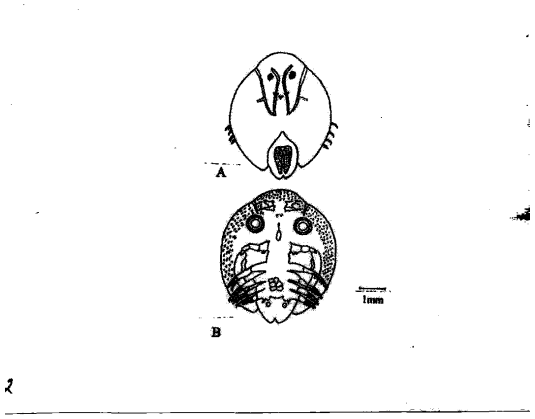


Fig. 2. *Argulus bengalensis,* A. Male (dorsal view), B. Female (ventral view)



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