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Lernaeid copepod (Cyclopoida) *Indopeniculus fryeri* Kumari, Khera and Gupta, 1988 parasitic on freshwater fishes of Haleji Lake, Sindh, Pakistan

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Abstract

Lernaeid copepod *Indopeniculus fryeri* reported from freshwater fishes of *Notopterus notopterus* (Pallas). Description is given of the lernaeid copepod parasitic species *Indopeniculus fryeri* first time recorded from freshwater fishes of Pakistan.

Keywords: Parasitic Copepoda, Lernaeidae, *Indopeniculus fryeri*, gill parasite of Freshwater Fishes, Haleji lake, Karachi, Pakistan

1. Introduction

Lernaeidae is a major family of cyclopoid copepods parasitic on freshwater fishes. All are fixed ectoparasites, that is, they penetrate the skin of fresh-water fishes. Some of them are among the most harmful parasites of cultured fishes; consequently, they have become the target for extensive studies (Yin, *et al.*, 1963; Kabata, 1985)^[1-3]. About 110 species of this family are currently known, with more than half (about 62%) of them occurring on freshwater fishes of Asia. However, only eight lernaeid species have been reported so far from the fishes of Thailand therefore, many more lernaeids probably await discovery.

The species *Indopeniculus fryeri* (Kumari, Khera & Gupta 1988)^[4] was reported from India and Ho and Kim, 1997^[5] from Thailand from the host *Notopterus notopterus* (Pallas).

During a parasitological survey of freshwater fishes of Haleji lake Sindh, Pakistan, one of the author collected specimens of Lernaeids (Copepoda: Cyclopoida) from the same host *Notopterus notopterus* (Pallas).

2. Materials and Methods

The specimens of *Indopeniculus fryeri* were collected from freshwater fish *Notopterus notopterus* (Pallas) captured from Haleji lake Thatta 70 km away from Karachi. The 200 fishes were captured during 2002 to 2004. The 80 female parasites were separated from the gills of the host and sorted out under the dissecting binocular and were preserved in the 70% alcohol. The specimens kept in the lactic acid for 4-5 minutes and figures were made with the help of camera Lucida and expressed in mm.

3. Results and Discussion

3.3.1. Female: Body elongated, cylindrical and unsegmented, swollen in trunk region (Figures 1 & 2).

3.3.2. Head squarish, star shaped, fleshy lobe one antero-ventral surface (Figures 2A & 2B). Total length 4.88 — 4.89 mm. Cephalothorax wider than long and irregular in shaped forming distinct neck like structure by the fusion of first and second thoracic segments. Third and fourth thoracic segments fused with genital segment to form trunk. Length 0.52 — 0.53 mm. First and second thoracic segments fused to form neck narrower than cephalothorax. Third and fourth segments fused to form trunk with posterior margin swollen (Figure 33). Length of neck 0.67 — 0.68 mm, Width 0.23 — 0.24 mm, Length of trunk 1.50 — 1.51 mm, Width 0.67 — 0.68 mm, All legs are biramous and consist of two segmented rami (Figures 5A — D).

3.3.3. Antennule two segmented, indistinctly divided into two parts, armed with bristles. Basal portion large, broad and consists of nine bristles on dorsolateral margin. Second segment

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short, blunt, narrow and five unequal bristles on dorsolateral margins and five in apical region (Figure 3A).

3.3.4. Antenna long, fleshy and two segmented. First segment large, broad and without bristles. Terminal segment six apical and four lateral bristles (Figure 3B).

3.3.5. Mandible absent.

3.3.6. First Maxilla reduced, unsegmented setae shaped and pointed at it's terminal end (Figure 4A).

3.3.7. Second Maxilla broad segment with terminal claw (Figure 4B).

3.3.8. Maxilliped with two segmented. Basal segment swollen and broad. Second segment with four recurved unequal chitinous claws (Figure 4C).

3.3.10. First Thoracic Leg near to head region. Terminal segment of exopod bears five unequal spines. Terminal segment of endopod with one spine (Figure 5A).

3.3.11. Second Thoracic Leg two spines present at terminal segment of exopod and one spine on endopod. Thoracic leg also present near to head region (Figure 5B).

3.3.12. Third and Fourth Thoracic Legs. Both rami similar to third and fourth thoracic legs. Second segment of exopod with two spines while endopod one spine. Found across to neck region (Figures 5C & 5D).

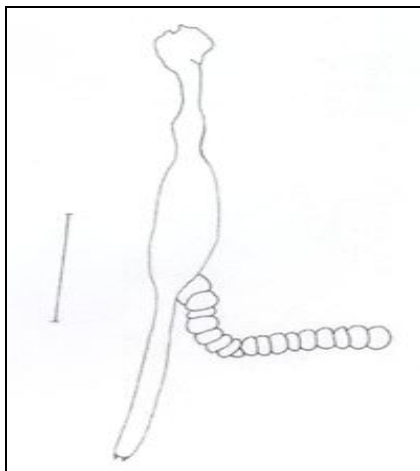


Fig 1: *Indopeniculus fryeri* (Kumari, khera & gupta) dorsal view.
Scale bar: 0.01mm

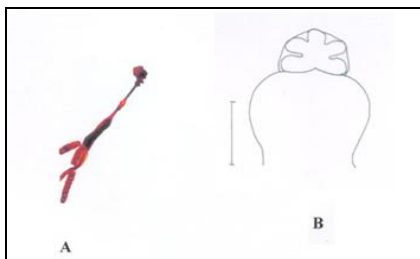


Fig 2: *Indopeniculus Fryeri* (Kumari, Khera & Gupta).
A. Lateral View (2*2) Mm)
B. Lateral View of head.
Scale bar: 0.01 mm

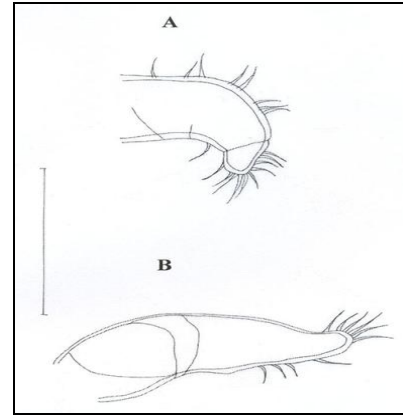


Fig 3: *Indopeniculus Fryeri* (Kumari, Khera & Gupta).
A. Antennule B. Antenna.
Scale Bar: 0.01 mm

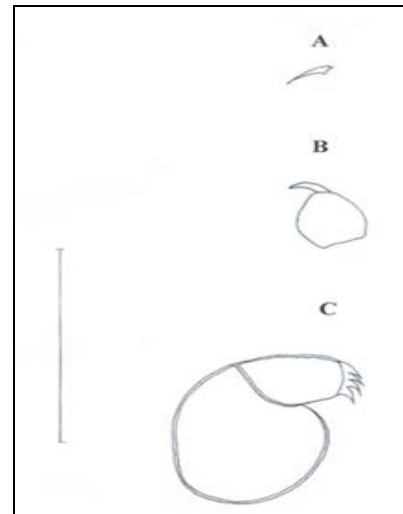


Fig 4: *Indopeniculus Fryeri* (Kumari, Khera & Gupta).
A. First Masilla, B: Second Masilla; C. Masilliped.
Scale bar: 0.1 mm

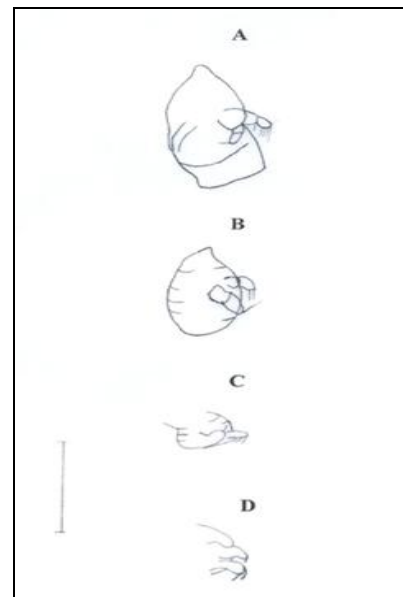


Fig 5: *Indopeniculus Fryeri* (Kumara, Khera & Gupta).
A. Firs Thoracic Leg (Left); B Second Thoracic Leg (Left); C Third Thoracic Leg (Left); D. Fourth Thoracic Leg (Left).
Scale bar: 0.01 mm

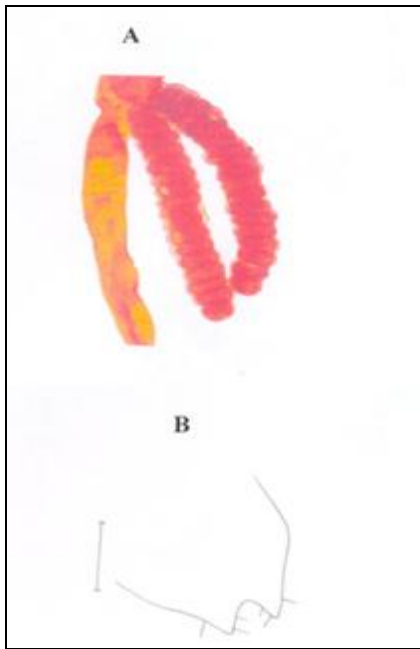


Fig 6: *Indoproniculus fryeri* (Kurari, Khera & Gupta). A. ovisacs (4*5 mm); B. Cudal rami scale bar: 0.01 mm

5. References

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3.3.13. Urosomal Genital Segment. Genital segment indistinct due to fusion of third and fourth thoracic segments which form trunk region. Posterodorsal surface of trunk with two uniserrate egg sacs, shorter than abdomen (Figure 6A). Length of egg sac 1.0- 1.2 mm. Abdomen long, cylindrical, single segmented and rounded at posterior end. One-fourth of whole body length.Length1.72- 1.76 mm. Width 0.40-0.44 mm.

3.3.14. Caudal Rami minute, oval shaped and each ramus tipped with three setae. Among them, two setae on inner side and one on outer side (Figure 6B).Length 0.03-0.04 mm. Width 0.01- 0.02 mm.

4. Discussion

The diagnostic feature is the presence of star shaped fleshy lobe on the anterolateral region of the head. It contains a slender neck, reduced first maxilla and all thoracic legs are fleshy lobes like in structure. This species reported from India by Kumari, *et al.* 1988^[4] and Ho and Kim, 1997^[5] from Thailand from the same host i.e. *Notopterus Notopterus* (Pallas).

The present species has great variations in the structures of antennule, antenna, maxilla, maxilliped and thoracic legs than those observed by Kumari, *et al.* (1988)^[4] and Ho and Kim (1997)^[5]. Kumari, *et al.* observed numerous setae and small basal segment of antennule. Ho and Kim noticed twenty six setae and large basal segment while the reported species has nineteen setae and large basal segment. The antenna differs also in having two segmentation but Kumari, *et al.* noted four segmented antenna. In addition, antenna is long and contains ten setae or bristles. According to Kumari, *et al.*, 1988^[4] short, having seven setae while Ho and Kim, 1997^[5] observed eleven setae on long antenna.

Moreover, Ho and Kim studied two segmented maxilla unlike the Kumari, *et al.* and the present specimens. There is also a variation in the size of maxilliped which is larger than the maxilla unlike the Ho and Kim.