

# **MESOOPHORODIPLOSTOMUM HECKMANNI, NEW SPECIES (TREMATODA: DIPLOSTOMIDAE) FROM *BUBULCUS IBIS* IN LARKANA SINDH, PAKISTAN**

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## **Abstract**

*Mesophorodiplostomum heckmanni* n. sp. infest the small intestine of *Bubulcus ibis* (Cattle egret). New specimens are similar to genus species *Mesophorodiplostomum anterovarium* (Dronen, 1985) and *Mesophorodiplostomum pricei* (Krull, 1934) Dubois 1936 with respect to general body appearance, but differs in oral sucker size, esophagus, acetabulum, holdfast organ, gonads, vitelline follicles distribution, copulatory bursa evert, and a new host and locality. A new species *Mesophorodiplostomum heckmanni* is proposed based on the unique morphotaxonomic features of the present specimens compared to all reported species of the genus *Mesophorodiplostomum*. It is the first record for this genus and host *Bubulcus ibis* (Cattle egret) from Larkana, Sindh, Pakistan.

**Keywords:** Trematode, *Mesophorodiplostomum heckmanni*, New Species, *Bubulcus Ibis* (Cattle Egret), Larkana Sindh, Pakistan.

## **INTRODUCTION**

*Bubulcus ibis* commonly known as Cattle egret is cosmopolitan bird belongs to family Ardeidae. It is mostly found in tropics, sub-tropics and temperate climatic zones most familiar waterside waders. There have been a few Trematode reports from *Bubulcus ibis* (Cattle egret) in Pakistan, but no Trematodes belonging to this genus *Mesophorodiplostomum* have been found. It is the first time *Mesophorodiplostomum heckmanni* has been identified in Larkana, Sindh, Pakistan, in the small intestinal of *Bubulcus ibis* (Cattle egret).

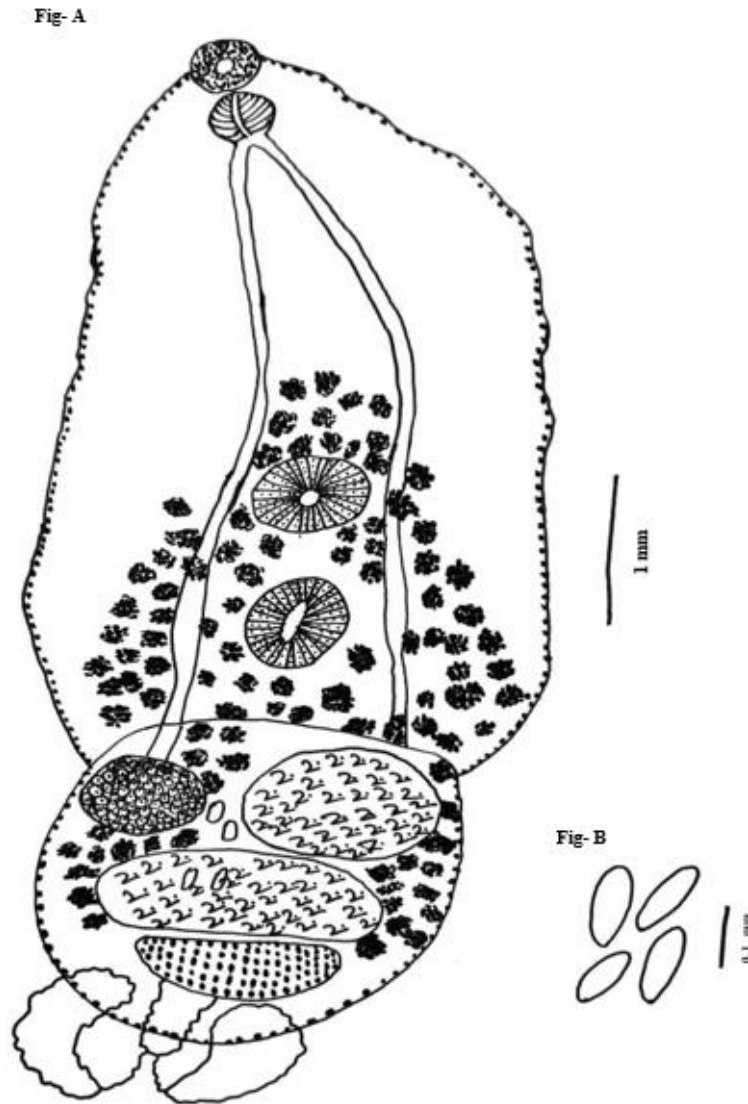
## MATERIAL AND METHODS

Sixteen *Bubulcus ibis* (Cattle egret) were trapped and shoot down all around the year from the four different Tehsils of District Larkana. The collected birds were taken to the Laboratory of Parasitology at the University of Sindh, Jamshoro for dissection and examination of helminth parasites. Nine out of sixteen *Bubulcus ibis* (Cattle egret) were found infected with 21 *Mesophorodiplostomum heckmanni* n.sp. Later these flukes were killed and settled in 70% steaming alcohol and then kept on neat glass slide and covered with cover slip and were wrapped lightly using thread and placed in Formalin Acetic Acid (F.A.A) solution for a whole day. Next, 70% alcohol was used to clear the specimens. Mayer's carmalum was used to stain the specimens. To remove excess stain, specimens were passed through series of graded alcohol. Later, the specimens were dipped in clove oil for 1-2 minutes and into xylene for 10-15 seconds. Finally, the specimens were permanently mounted with Canada balsm. Line drawings were made with the help of camera lucida and measurements of entire specimen and different organs were taken in mm.

### ***Mesophorodiplostomum heckmanni* sp.n.**

(Fig. A-B)

Host:	<i>Bubulcus ibis</i> (Cattle egret) Linnaeus, 1758
Locality:	Larkana, Sindh, Pakistan
Location:	Small Intestine
Number of Hosts examined/infected:	16/09
Number of specimens recovered:	21



**Figure A: *Mesophorodiplostomum Heckmanni* sp.n (Entire Worm)**

**Figure B: Enlarged View of Eggs**

**DESCRIPTION IS BASED UPON TWENTY ONE MATURE, EGG BEARING STAINED AND PERMANENTLY MOUNTED SPECIMENS**

Body of the fluke is divided into fore and hind body parts; total body length measured 1.34 x 0.27. Fore body elongated, larger than hind body with well-developed hold fast organ measured 0.56 long and maximum widths measured 0.34 at the posterior region of holdfast organ. Hind body shortened, cylindrical, smaller than fore body, measured 0.37 x 0.21. Oral sucker spherical small measured 0.032 x 0.028. Pre-Pharynx not prominent. Pharynx oval in shape, and measured 0.036 x 0.031. Esophagus very short starts just

behind the pharynx followed by intestinal bifurcations. Acetabulum rounded, larger than oral sucker, and median of fore body, and measured 0.055 x 0.055. Holdfast organ oval to elongated, post acetabular and present in the end of fore body measured 0.072 x 0.055. Testes tandem, asymmetrical, present in the hind body. Anterior testis is oval to rounded in shape and in right side of ovary measured 0.094- 0.089. Posterior testis is oval to elongated, larger than the anterior testis, postoverian measured 0.073 x 0.122. Ovary is rounded, flattened, lateral and above the posterior testis and opposite to the anterior testis measured 0.059 x 0.056. Vitellaria follicular, scattered, starts above the acetabulum extended in intestinal bifurcation and reaches to the post testicular region. Eggs oval to elongate in shape measured 0.086 x 0.065.

## DISCUSSION

Present specimens resembles two earlier reported species *Mesophorodiplostomum anterovarium* Dronen, 1985 reported from *Ajaia ajaja* in Texas, and *M. pricei* (Krull, 1934) Dubois, 1936 recovered from *Larus argentatus* in North America in avian hosts in general body shape but differ in following characteristic's:

- Shape and size of fore- and- hind body parts
  - Size , shape and position of oral sucker
  - Shape, size and position of ventral sucker
  - Variation in length of esophagus
  - Arrangement of the vitelline follicles
  - Shape, size and location the gonads.
  - Size and shape of eggs.
1. *Mesophorodiplostomum heckmanni* n.sp is similar to *Mesophorodiplostomum anterovarium* Dronen, 1985 and *M. pricei* (Krull, 1934) Dubois, 1936 in general body shape but differs in having larger body size than *M. anterovarium* Dronen, 1985 and smaller than *M. pricei* (Krull, 1934) Dubois, 1936.
  2. Oral sucker is sub-terminal in present specimens and in *M. anterovarium* Dronen, 1985 and *M. pricei* (Krull, 1934) Dubois, 1936 but differs in having large size.
  3. Pharynx in present specimens is nearly equal in size to *M. pricei* (Krull, 1934) Dubois, 1936 and smaller than *M. anterovarium* Dronen, 1985.
  4. Acetabulum in present specimens in rounded differs from *M. anterovarium* Dronen, 1985 and *M. pricei* (Krull, 1934) Dubois, 1936 in having oval to spherical shape.
  5. Ovary in present specimens is lateral, present opposite to anterior testis and above the posterior testis differs from *M. anterovarium* Dronen, 1985 and *M. pricei* (Krull, 1934) Dubois, 1936 where ovary is intertesticular.

6. The testes in present specimens are smaller in size than the *M. anterovarium* Dronen, 1985 and *M. pricei* (Krull, 1934) Dubois, 1936. (Table-1).
7. Vitellaria in present specimens are follicle shape and discontinuously distributed to the post testicular region while in *M. anterovarium* Dronen, 1985 and *M. pricei* (Krull, 1934) Dubois, 1936 in they are follicle shape and arranged continuously in clusters.

**Table 1: Shows the Comparative Body Measurements of the Genus Mesoophorodiplostomum**

	<i>Mesoophorodiplostomum anterovarium</i> Dronen, 1985	<i>Mesoophorodiplostomum Pricei</i> (Krull, 1934) Dubois, 1936	Present Specimens
Total body length	0.966 x 0.244	2.07 x 0.37	1.34 x0.37
Oral Sucker	0.053 x 0.040	0.050 x 0.040	0.032 x0.028
Pre- Pharynx	Absent	Absent	Absent
Pharynx	0.043 x 0.026	0.035 x 0.029	0.036 x0.031
Ventral Sucker	0.069 x 0.057	0.060-0.063 x0.072-0.081	0.055 x0.055
Holdfast organ	0.092 x 0.065	0.205-0.250 x0.200-0.210	0.072 x0.055
Ovary	0.064 x 0.092	0.090-0.100 x0.097-0.117	0.059 x0.056
Anterior Testis	0.103 x 0.172	0.220-0.270 x0.250-0.290	0.094 x0.089
Posterior Testis	0.119 x 0.251	0.180-0.230 x0.280-0.295	0.073 x 0.122
Eggs	0.094 x 0.057	0.068-0.089 x0.059-0.061	0.086 x 0.065

Keeping in view the above specific morphometric differences, the present specimens are proposed to be new to science. The Larkana is a new locality record and species of the genus is a first record in Larkana, Sindh, Pakistan. *Mesoophorodiplostomum heckmanni* n.sp. Is therefore proposed as a new species. Species name in honor of distinguished Scientist / Parasitologist late Dr. Richard. A. Heckman of Brigham Young University, Utah, U.S.A.

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