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Uvitellina megacaecatum sp.n. (Trematoda: Cyclocoelidae) from the intestine of *Himantopus himantopus* (Black winged stilt) in Nausharo feroze, Sindh, Pakistan

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Abstract

A new species of the genus *Uvitellina* [16] is described from *Himantopus himantopus* Linnaeus, 1758 and proposed as *Uvitellina megacaecatum*, referring to the extra-ordinary stout caeca. The new species is characterized by Stumpy and stout body, extra-ordinary stout caeca, absence of pharynx, uterus occupying extra-caecal, lateral and posterior most position, eggs boat shaped and elongated, most of them with scaly outer covering and black dots inside.

Keywords: *Uvitellina*, Cyclocoelidae, *Himantopus himantopus*, Nausharo feroze, Sindh, Pakistan

1. Introduction

The genus *Uvitellina* belongs to the family Cyclocoelidae [14], sub-family Haematotrepinae [5]. Species of the genus have been reported from Russia, Turkestan, Japan, California, Iraq, Ukraine, India and Pakistan.

Only two species of the genus have been reported from Pakistan, one is *U. indica* [13, 2] reported from *Vanellus indicus* and *U. teesae* recovered from White-Eyed Buzzard (*Butastur tease*) [4] Yamaguti [19] reported eight species in the genus: *U. pseudocotylea* [16] found in Stilt-Legged; *U. indica* [13] reported from Red-wattled lapwing; *U. kaniharensis* [9] from Greenshank; *U. kerri* [17] from Grey-headed lapwing; *U. macroisophaga* [10] from killdeer; *U. magniembria* [16] from Stilt-Legged Plover; *U. tageri* [17] and *U. vanelli* [12, 1] recorded from Northern lapwing.

Haematotrepus adelphus [11] reported in the white-headed stilt; however, [16] transferred this species to *Uvitellina* as *Uvitellina adelpha* because the vitelline fields were confluent posteriorly. *U. dollfusi* [15] recovered from Grey-headed lapwing and Yamaguti [19] maintained this species in *Haematotrepus*; however, original description clearly shows that the vitelline fields were confluent posteriorly. Recent species of the genus *U. iraquensis* [6] have been reported from White tailed lapwing and *U. himantopi* [7] is reported from Black winged stilt.

Present specimens of the genus *Uvitellina* are collected from *Himantopus himantopus* (Black winged stilt) in Nausharo feroze, Sindh, Pakistan.

Black winged stilt is widely distributed, it is long-legged, wading bird. The widespread geographical range of the black winged stilt occurs across as far as Africa, Europe, Asia and United States. The diet of the black-winged stilt is varying according to season, but typically they take aquatic insects, spiders, worms, tadpoles, small fish, fish eggs, mollusks, crustaceans and seeds. The black-winged stilt is found in shallow aquatic systems (e.g., lakes, rivers, swamps, marshes, estuaries, brackish pools) from western Europe to central Asia in the north, Southward to Africa in the west, and to the northern Indian subcontinent in the east [3].

2. Materials and Methods

Five birds *Himantopus himantopus* (Black winged stilt) were caught alive during November 2015 to June 2016, from District Nausharo feroze, Sindh, Pakistan and brought to the parasitology laboratory, Department of Zoology, University of Sindh, Jamshoro, Pakistan. The birds were then anesthetized, dissected and examined for collection of internal Helminth parasites. During examination of gut contents and visceral organs four mature specimens were collected from the small intestine of a bird. Later these specimens were fixed in hot steaming 70% ethanol, where trematodes expand and instantly die. Later the specimens were gently placed over clean glass slide, pressed lightly with another, tied with thread and fixed in F.A.A.

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solution for twenty-four hours, stained with Mayer's carmalum, dehydrated in graded series of ethanol, cleared in clove oil and rinsed with xylene. Finally, the specimens were permanently mounted in Canada balsam for further study. Line Drawings were prepared with the aid of a Camera Lucida. Measurements are in millimeters (mm) and length by width. Photomicrographs were prepared with the courtesy of Vertebrate Pest Control Institute, Southern Zone Agricultural Research Center, Karachi University Campus, Karachi.

3. Results

3.1 *Uvitellina megacaecatum* sp.n.

(Figs. 1-6)

Host: *Himantopus himantopus* (Black winged stilt)

Location: Small intestine

Locality: Nausharo feroze, Sindh, Pakistan.

Number of hosts examined/infected: 05/01

No of specimens recovered: 04

Etymology: Species name refers to the stout and stumpy caeca.

3.2 Description (is based upon, four permanently mounted, egg bearing specimens).

Body stout, stumpy, smaller in size being less than 10mm. Anterior region narrower than the posterior. Posterior region is broadly rounded in shape. The posterior region contains the gonads, which appear to form a rough triangle. Total body length is 5.36-8.25 (6.482) by 1.5-1.81 (1.73). Maximum width is attained at the posterior gonadal region in three specimens, while the 4th specimens comparatively broader anteriorly and tapers in the posterior gonadal region to a roughly pointed end (Fig. 2).

The oral sucker is terminal, it is highly muscular, rounded, wider than long 0.304-0.42 (0.249) by 0.32-0.50 (0.27). Pharynx not conspicuous or appears to be absent.

The caeca appear to start just below the oral sucker. These are extra-ordinary stout and stumpy for most of its length, while in the posterior third region the caeca attain normal width, become united posteriorly and are full of brown homogenous matter. The ventral sucker is absent.

The testes are tandem just in front of the caecal arch, lie in posterior most region of hind body, upper testis is rounded in shape and smaller than lower testis 0.40-0.579 (0.476) by 0.33-0.507 (0.382), the lower testis is rounded to oval 0.510-0.63 (0.556) by 0.391-0.724 (0.501).

Seminal vesicle weakly developed (Fig.3) lie just below the oral sucker leading to the genital opening in conjunction with the metraterm.

Ovary lie in front of the anterior testis in the posterior body region, it is oval in shape measure, 0.31-0.597 (0.4405) by 0.22-0.376 (0.3143).

The vitelline follicles are small, numerous, start from some distance below the caecal- bifurcation and extend laterally along the intestinal caeca up to the posterior extremity of the body.

Uterus is voluminous, occupy space throughout the body, right from below the caecal bifurcation up to the posterior end of the body i.e. below the caecal arch, the uterus is also observed in the extra-caecal lateral fields of the body.

Most of the eggs are with typically scaly outer walls, boat shaped, elongated and oval, while eggs with normal outer walls are also obvious. Most of the eggs are provided each with one or two black spot inside 0.13-0.144 (0.131) by 0.05-0.057(0.054) in size.

4. Discussion

Yamaguti, ^[19] have reported eight species of the genus *Uvitellina* ^[16] with *U. pseudocotylea* ^[16] from *Himantopus candidus* as type species from Russia, Turkestan. This species has also been recorded from *Charadrius placidus* in Japan ^[18]. Other species have been reported from India, Japan, California, Iraq, Ukraine and Pakistan

Gibson ^[8] have reported *U. adelphus* ^[11, 16] as type species of the genus *Uvitellina*. Species reported from Pakistan are *U. indica* ^[13, 2], from *Vanellus indicus* in Lahore, Pakistan; *U. teesae* ^[4] from White-Eyed Buzzard (*Butastur teesa*) in Hala, Hyderabad, Sindh, Pakistan.

Present specimens have been recovered from *Himantopus himantopus* (Black winged stilt) while *U. pseudocotylea* is from *Himantopus candidus* (Stilt-Legged Plover); other species are: *U. indica* reported from *Lobivanellus indicus* (Red-wattled lapwing) in Aligarh, India; *U. kaniharensis* ^[9] from *Glottis nebularia* (Greenshank) in Kanihar, India; *U. kerii* ^[17] from *Vanellus cinereus* (Grey-headed lapwing) in Japan; *U. macroisophaga* ^[10] from *Oxyechus vociferous* (killdeer) in California; *U. magniembria* ^[16] reported from *Himantopus candidus* ((Stilt-Legged Plover)) in Russian and Turkestan; *U. tageri* ^[17] and *U. vanelli* ^[12, 1] recorded from *Vanellus Vanellus* (Northern lapwing) in Japan and Vien; *U. dollfusi* ^[15] recovered from *Vanellus cinereus* (Grey-headed lapwing) in Nanjing; *Uvitellina adelpha* reported in the *Himantopus leucocephalus* (White-headed stilt) from Australia *U. teesae* ^[4] from *Butastur teesa* (White-eyed buzzard) in Pakistan; *U. iraquensis* ^[6] have been reported in Basrah Province of Iraq from *Vanellus leucurus* (White tailed lapwing) (Lichtenstein) and *U. himantopi* ^[7] is reported from *Himantopus himantopus* (Black winged stilt) in Ukraine.

Body size in present species is (5.36 by 1.59) differ from *U. pseudocotylea* (6.5-12 x 2-4); *U. indica* (5.683-7.656 x 1.113-1.536); *U. kaniharensis* (13.44-16.128 x 2.88-3.84); *U. kerii* (7-14 x 1.4-2.4); *U. macroisophaga* (6-9 x-); *U. tageri* (20.4 x 3.3); and *U. teesae* (7.89 x 1.49); *U. magniembria* (6,500–12,000); *U. dollfusi* (14,000); *U. iraquensis* (8,834-10,459) and *U. himantopi* (13, 644-15100) having smaller body size. (Table.1)

In present specimen's pharynx is not conspicuous or appears to be absent, while in *U. pseudocotylea*; *U. indica*; *U. adelphus*; and *U. teesae*, *U. iraquensis* and *U. himantopi* it is present.

In present specimen's intestinal caeca start from below the oral sucker, while in *U. pseudocotylea*; *U. indica*; *U. adelphus*; *U. teesae*; *U. iraquensis* and *U. himantopi* the intestinal caeca start below the pharynx.

In present specimens the size of eggs is (0.13-0.144 by 0.05-0.057) while in *U. indica* it is (136-153 x 50-59); in *U. kerii* (140-200 x 50-70); in *U. macroisophaga* (128-143 x 43-57); in *U. tageri* it is (175 x 70); in *U. vanelli* (170-180 x 70-80); in *U. teesae* it is 133-216 x 49; in *U. iraquensis* (363-420) and in size of eggs are *U. himantopi* (380-408). In all rest of species are larger size of eggs.

Present specimens are quite different from above reported species. Main differences noted are:

1. Size of body measurements (Differences noted in Table. 1)
2. Stumpy and stout body.
3. Extra-ordinary stout caeca and position of commencing of caeca
4. Absence of pharynx
5. Extra-caecal, lateral and posterior most position of uterus

6. Boat shaped, elongated eggs in most of the eggs the outer covering is scaly and in having, one or two having black dots inside.

Therefore, the present specimens are designated as new species as *Uvitellina megacaecatum* sp. n. The species name refers to the stout caeca.

Table 1: Comparison of various species of genus *Uvitellina* [16] reported from all over the globe.

Name of organs	<i>U. vanelli</i> Syns. <i>U. tageri</i> and <i>U. kerii</i>	<i>U. Adelphus</i>	<i>U. pseudocotylea</i> Syn. <i>U. magniembria</i>	<i>U. dollfusi</i>	<i>U. macroisophaga</i>
Host	<i>Vanellus vanellus</i>	<i>Himantopus leucocephalus</i>	<i>Himantopus candidus</i> , <i>Charadrius placidus</i>	<i>Vanellus cinereus</i>	<i>Oxyechus vociferus</i>
Locality	Vien	South Australia	Russian, Turkestan, Japan	Nanjing	California, U.S.A.
Body size	20.400	8.100–14.820	6.5-12 x 2.4	14.000	7.8(6-9)
Oral sucker width	None	None	None	None	210
Pharynx width	500	310	262–331	483	155 (143–171)
Testes width	690	505	661–1,254	955 (920–989)	461 (414–628)
Ovary width	350	291	319–513	529	191 (142–242)
Eggs length by width	175 (170–180) by 75 (70–80)	240 by 107	147 (134–159) by 55 (48–62)	243 (230–253) by 106 (92–115)	136 (128–143) by 50 (43–57)

Continued

Name of organs	<i>U. kaniharensis</i>	<i>U. indica</i>	<i>U. teesae</i>	<i>U. iraquensis</i>	<i>U. himantopi</i>	<i>U. megacaetum</i> sp.n.
Host	<i>Glottis nebularia</i>	<i>Lobivanellus indicus</i>	<i>Butastur teesa</i>	<i>Vanellus leucurus</i>	<i>Himantopus himantopus</i>	<i>Himantopus himantopus</i>
Locality	India	India	Pakistan	Iraq	Ukraine	Pakistan
Body size	13.44-16.128 by 2.88-3.84	5.683-7.656 by 1.113-1.536	7.89 by 1.49	8,834-10,459	13,644-15,100	is 5.36-8.25 (6.482)
Oral sucker width	272–336	210–326	360	363 (290–420)	408 (380–450)	0.32-0.50 (0.27)
Pharynx width	288–355	249–345	416	323 (295–345)	383 (370–395)	Absent
Testes width	528–1,040	384–594	433–533	513 (300–690)	626 (470–710)	Ant: 0.33-0.507 (0.382)0.391-0.724 (0.501).
Ovary width	320–336	210–268	299	289 (240–340)	425 (410–485)	0.31-0.597 (0.4405) by 0.22-0.376 (0.3143).
Eggs length by width	-----	145 (136–153) by 55 (50–59)	175 (133–216) by 49	205 (193–215) 72 (63–88)	183 (150–195) by 98 (90–105)	0.13-0.144 (0.131) by 0.05-0.057 (0.054)

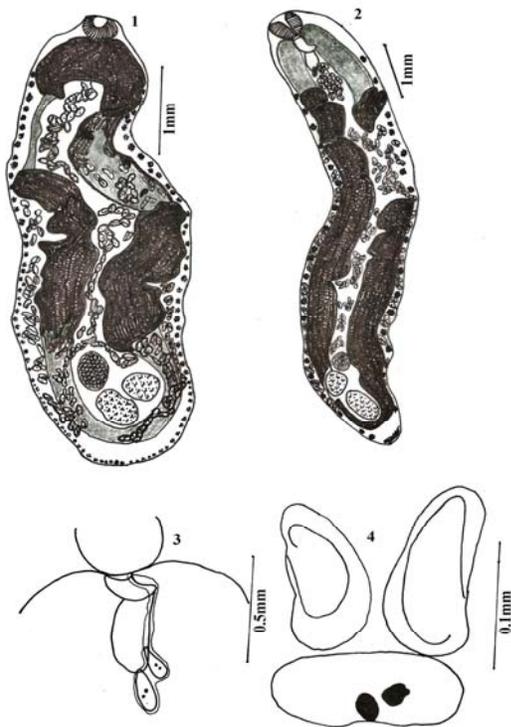


Fig 1: *Uvitellina megacaecatum* sp.n. holotype, entire worm.
Fig 2: *Uvitellina megacaecatum* sp.n. paratype, entire worm.
Fig 3: Enlarged view of seminal vesicle, metraterm and genital opening.
Fig 4: Enlarged eggs.

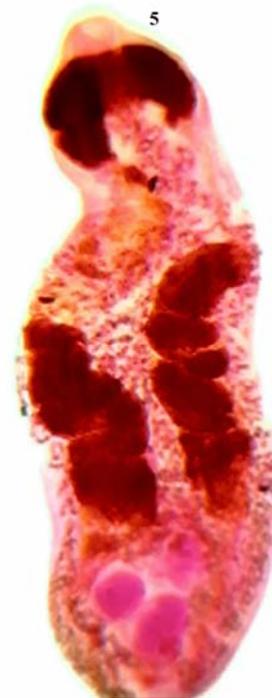


Fig 5: *Uvitellina megacaecatum* sp.n. holotype, entire worm Photomicrograph (27x)



Fig 6: *Uvitellina megacaecatum* sp.n. paratype, entire worm
Photomicrograph (26x).

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