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New species *Brachylecithum jehangiri* n.sp. (Trematode: Dicrocoellidae) from Pied myna *Gracupica contra* (Passeriformes: Sturnidae) in District Larkana, Sindh Province-Pakistan

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Abstract

A new trematode *Brachylecithum jehangiri* n.sp is described from the Liver of Pied myna (*Gracupica contra*) Larkana District, and Sindh, Pakistan. In all, 32 trematodes belonging to the genus *Brachylecithum* Shtrom, 1940 were collected. Present trematodes differ from their congeners in body shape, size, shape of testes and distribution of uterus. On the basis of such morpho-metrical changes this species *Brachylecithum jehangiri* may be treated as a new species. This new species is dedicated in the honor of Dr. Jehangir Soomro (Trainee in general surgery Fcps part. 2).

Keywords: Avian trematode, *Brachylecithum jehangiri* n.sp., Pied myna (*Gracupica contra*) Linnaeus, 1758, Sindh, Pakistan

Introduction

The Pied myna Asian pied starling (*Gracupica contra*) Linnaeus, 1758 belongs to the Class Aves, Order Passeriformes, and Family Sturnidae. Species starling founds in the Indian sub continent and Southeast Asia. They are usually found in small groups mainly on the plains and low foothills. They are often seen within cities and villages although they are not as bold as the common myna. This myna is stunningly marked in black and white and has a yellowish bill with a reddish bill base. The bare skin around the eye is reddish in color. The upper body, throat and breast are black while the cheek, wing coverts and rump are contrastingly white. Both sexes are similar in plumage but young birds have dark brown in place of black as reported by: (Rasmussen, P.C and Anderton J.C, 2005); ^[1] the sub species vary slightly in plumage, extent of streaking of the feathers and in measurements. The flight is slow and butterfly-like on round wings reported by: (Freare and Chris.*et.al* 1998); ^[2] these starlings are usual found in small groups, foraging mainly on the ground but perching on trees and buildings. Birds in a group call regularly with a wide stock that includes viz: whistles, trills, buzzes, clicks, and warbling calls.

Materials and Method

Live 15 pied mynas belonging to Family Sturnidae were collected from different localities of District Larkana, Sindh, Pakistan and were dissected in Laboratory. Live 32 trematodes were recorded from the liver of (*Gracupica contra*) Linnaeus, 1758, and were put into Petri dishes containing 2% normal saline solution. These endohelminthes parasites were collected and dehydrated in graded series of ethanol. Specimens were stained in borax carmine, cleared in xylol and passed through clove oil for shining and finally mounted permanently on slide with the help of Canada balsam. Diagrams were made by using camera Lucida reported by (Garcia and Ash., 1979). ^[3] The key was prepared for the identification of species. Photographs were taken by the help of digital camera. All international parameters were used for measuring variations in millimeters (Table: 1).

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Fig 1: Pied myna *Gracupica contra* collected from different localities of District Larkana.

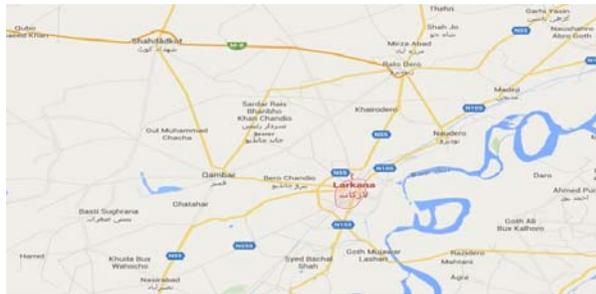


Fig 2: Map of District Larkana from where pied myna *Gracupica contra* was collected.



Fig 3: Photographic view *Brachylecithum jehangiri* n.sp.

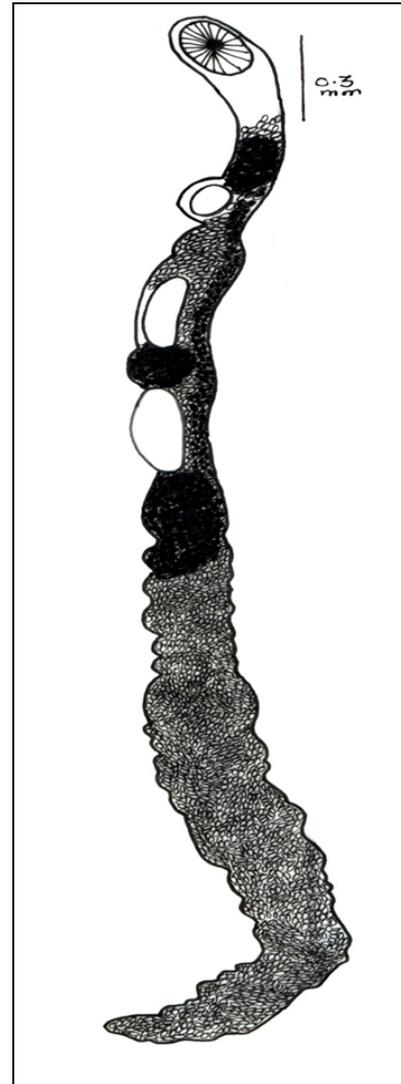


Fig 4: *Brachylecithum jehangiri* n.sp. Lateral view

Table 1: showing comparative characteristic of various species of genus *Brachylecithum* (Shtrom, 1940) collected from different host.

S.NO	Parameters	Present species	<i>B. gruis</i>	<i>B. seiricum</i>	<i>B. dselicatum</i>	<i>B. moorei</i>
1.	Body	3.54-3.49 x 0.23-0.20	5.24	1.79-0.18	1.43-0.17	3.38-0.27
2.	Oral sucker	0.021-0.01 x 0.13-0.10	0.25-0.23	0.11-0.14	0.10-0.08	0.18-0.17
3.	Ventral sucker	0.03-0.01 x 0.08-0.05	0.18-0.28	0.14-0.19	0.10-0.14	0.17-0.28
4.	Anterior testis	0.25-0.19 x 0.068-0.050	0.26-0.14	0.06-0.07	0.08-0.07	0.20
5.	Posterior testis	0.31-0.29 x 0.10-0.10	0.41-0.19	0.15-0.18	0.17-0.14	0.35
6.	Ovary	ND	0.13-0.12	0.04-0.08	0.05-0.12	0.13-0.19
7.	Post-testicular space	1.84-1.75	ND	ND	ND	ND
8.	Distance between oral and ventral sucker	0.40-0.3	ND	ND	ND	ND
9.	Distance between anterior and posterior testis	0.16-0.12	ND	ND	ND	ND
10.	Eggs	35-21 μ	36-22 μ	39-22 μ	34-19 μ	36-23 μ
11.	Host	<i>Gracupica contra</i>	<i>Gruis canadensis</i>	<i>Seiurus aurocapillus</i>	<i>Pipilo erythrophthalmus</i>	<i>Bubo virginianus</i>
12.	Habitat	Liver	Liver	Liver	Liver	Liver
13.	Locality	Larkana	Texas	Virginia	North Carolina	United states

ND = not detectable: Measurement of parameters is in millimeters and measurement of eggs and measurement of eggs is in micrometer (Table: 1).

Results

Taxonomic position

Host: Pied myna

Parasitic Habitat: liver

Locality: District Larkana, Sindh, Pakistan

No: of host examined: 15

No: of host infected: 05

No: of specimen recovered: 32

Etymology: The name of new species refers in the honor of my Dr. Jehangir Soomro

Description

Body of the worm is muscular, thick and elongated anteriorly rounded while posteriorly tapers measuring 3.54-3.49 x 0.23-0.20 mm. Oral sucker sub terminal and oval in shape measuring 0.02-0.02 x 0.13-0.10 mm in diameter. Ventral sucker oval in shape protruded outside of the body and surrounded by highly coiled uterus measuring 0.03-0.01 x 0.08-0.03mm in diameter. Both suckers separated by the distance 0.40-0.31mm. Ovary completely overlapped with the uterus and not visible clearly. Both testes are tandem in position separated from each other by the highly coiled loops of uterus 0.16-0.12mm. Anterior testis is bean-shaped measuring 0.25-0.19 x 0.68-0.50mm while posterior testis is also bean-shaped and slightly broader than anterior one measuring 0.31-0.29 x 0.10-0.10mm below posterior testis uterus is highly coiled and reflects as dark area. Post-testicular space measuring 1.84-1.75mm. Uterus commences below the level of oral sucker and is distributed up to posterior extremity. Eggs operculated and brown to black in color which are measuring 35-21 μ respectively.

Discussion

Few reported species of genus *Brachylecithum* (Shtrom, 1940) [4] reported viz: *B. alfortense* (Railliet, 1954); [4] *B. amurensis* (Shcherbovich, 1946) yamaguti 1958; [4] *B. asovi* (Lyman, 1926) Shtrom 1940; [4] *B. baskakowi* (Ivanizky, 1926) Shtrom, 1940; [4] *B. chibichenko*, 1959; [4] *B. burjatmongolicum* (Oshmarin, 1948); [4] *B. capilliforme* (Oshmarin, 1948); [4] *B. chapmani* Singh, 1962; [4] *B. chivosca* (Pratt et cutress, 1949); [4] *B. colorosum* (Patwardhan, 1935) Skarjabin et Evranova, 1953; [4] *B. coturnixi* Oshmarin, 1952; [4] *B. cuculi* Oshmarin in Skarjabin Evranova, 1952; [4] *B. delicatum* Denton et Byrd, 1951; [4] *B. emberizae* (yamaguti, 1941); [4] *B. eophonae* (yamaguti, 1941) Skarjabin et Evranova, 1953; [4] *B. eugenia* Oshmarin 1948; [4] *B. filiforme* (Skrjabin, 1913) Shtrom, 1940; [4] *B. fringillae* (Layman, 1923) Shtrom, 1940; [4] *B. gorbunovi* (Shtrom, 1935) Shtrom, [4] 1940; *B. gruis* Denton et Byrd, 1951; [5] *B. grummti* Odening, 1963; [4] *B. halcyonis* (Yamaguti, 1941) Skarjabin et Evranova, 1953; [4] *B. harrisoni* (Johnston, 1917) Skarjabin et Evranova, 1953; [4] *B. idahoense* Schell, 1957; [4] *B. indicum* Singh, 1962; [4] *B. innatum* (Railliet, 1900) Shtrom, 1940; [4] *B. kirghisense* Evranova, 1953; [4] *B. lari* (Travassos, 1917) Shtrom, 1940; [4] *B. lobatum* (Railliet, 1900) Shtrom, 1940; [4] *B. lobatum glandarii* (Semenov, 1927) Shtrom, 1940; [4] *B. lobatum strix* Oshmarin Skarjabin et Evranova, 1953; [4] *B. lossi* (Layman, 1926) Shtrom, 1940; [4] *B. magnitestium* (Layman, 1922) Shtrom, 1940; [4] *B. marinholutzii* (Travassos, 1941) Skarjabin et Evranova, 1953; [4] *B. megacotyle* (Baer, 1959); [4] *B. megastomum* (Johnston, 1917) Skarjabin et Evranova, 1953; [4] 1959; [4] *B. orfi* Kingston et Freeman, 1959; [4] *B. parvum* (Johnston, 1917) Skarjabin et Evranova, 1953; [4] *B. platynosomoides* Potekhina, 1948; [4] *B. praetenue* Oshmarin in Skarjabin and Evranova 1953; [4] *B. raoi* Jaiswal, 1964; [4] *B. sayeedi* Jaiswal, 1957; [4] *B. scharmuti* Gargarin, Ablasov et

Chibichenko 1957; [4] *B. schoutedeni* Vercammen-Grandjean, 1960; [4] *B. skrjabini* Jaiswal, 1957; [4] *B. strigis* (Yamaguti, 1939); [4]. *B. tetraogalli* Gvosdev, 1953; [4] *B. transversogenitale* (Layman, 1922) Skarjabin et Evranova, 1953; [4] *B. transversum* Shtrom, 1940; [4] *B. uigurica* Evranova in Skarjabin and Evranova, 1952; [4] *B. vanellicola* (Layman, 1922) Shtrom, 1940; [4]. *B. exochocotyle* Denton et Byrd, 1951; [5]. *B. gruis* Denton et Byrd, 1951; [5]. *B. rarum* J. Fred Denton and Elon E. Byrd, 1951; [5]. *B. moorei* Denton et byrd, 1951; [5] *B. nanum* Denton et byrd, 1951; [5]. *B. seiuricu* Denton et Byrd, 1951; [5]. *B. andamanensis* T. D Soota, C. B Srivastava and R. K Ghosh, 1972; [6] *B. philippinense* Jacob H. Fischthal and Robert E. Kuntz, 1973; [7] *B. palawanense* Jacob H. Fischthal and Robert E. Kuntz, 1973; [7]. *B. microtesticulatum* Timon-David, 1955; [8]. *B. strigosum* J. K. Macko, V. Hanzelova and A. Mackova 1894; [9]. *B. stunkardi* (Pande, 1939) Denton et Byrd, 1951; [10]. *B. attenuatum* Jacob H. Fischthal and Robert E. Kuntz, 1974 [11]. *B. microfiliforme* Salcedo L. Eduardo, 2003 [12]. *B. glareoli* Hildebrand J. Okulewicz J. Popiolek. M, 2007 [13]. *B. hydromyos* Angel L. Madeline and Pearson, 1977 [14]. *B. daceionis* Angel L. Madeline and Pearson, 1977 [14]. *B. insulare* Angel L. Madeline and Pearson, 1977 [14]. *B. podagri* Angel L. Madeline and Pearson, 1977 [14].

B. rarum J. Fred Denton and Elon E. Byrd, 1951 [5] recorded from *Pipilo erythrophthalmus* of Virginia differs from *B. jehangiri* in having body of the worm is large and robust; acetabulum with shallow, saucer like lumen in living or relaxed specimens with centre protruded so as to eliminate lumen in most fixed specimen and located in anterior sixth of body; testes round to oval, equal in size and situated in body middle, with one directly behind the other; anterior testis separated from acetabulum by three to six transverse loops uterus; posterior testis separated from anterior one by a single dorsoventrally loops of uterus; ovary transversely oval in shape, situated in middle of body and separated from posterior testis by one to four transverse loops of uterus.

B. tuberculatum J. Fred Denton and Elon E. Byrd, 1951; [5] recorded from *Wilsonia canadensis* of Virginia differs from *B. jehangiri* acetabulum contain saucer like lumen in living and contracted specimens, or with centre protruded, testes round to elongated oval, equal in size, situated one directly behind other and occupying most of width of body; anterior testis touching acetabulum and separated from it by one or two loops of uterus; posterior testis contiguous with anterior testis; ovary round to oval in shape, smaller than testes, located on midline immediately behind posterior testis and separated from the ovary by one to three loops of uterus.

B. nanum J. Fred Denton and Elon E. Byrd, 1951 [5] recorded from *Pipilo erythrophthalmus* of Virginia differs from *B. jehangiri* in having smaller body size, acetabulum lemon shaped in frontal view but without prominent auricular appendages, but with shallow and saucer like lumen; testes oval shaped nearly equal in size, situated one directly behind other and occupying almost entire width of body; anterior testis separated from acetabulum by one to four loops of uterus; posterior testis contiguous to anterior testis or separated from it by a single uterine loop; ovary oval shaped situated near middle of the body and separated from posterior testis by one to three uterine loops.

B. gruis J. Fred Denton and Elon E. Byrd, 1951 [5] recorded from *Gruis Canadensis* of Texas differs from *B. jehangiri* in having smaller body; oral sucker and ventral sucker both are equal in size; p anterior testis separated from the acetabulum by two or three lateral loops of uterus; ovary oval and slightly

sub medially in position.

B. seiuricum J. Fred Denton and Elon E. Byrd, 1951^[5] recorded from *Seiurus aurocapillus* of Virginia differs from *B. jehangiri* in having smaller body; acetabulum contain shallow saucer like lumen or centre protruded far enough to obliterate lumen in anterior fourth of the body; ovary round to transversely oval on midline or slightly to one or other side of that line and separated from posterior testis by one or two loops of uterus.

B. delicatum J. Fred Denton and Elon E. Byrd, 1951^[5] recorded from *Pipilo erythrophthalmus* of North Carolina differs from *B. jehangiri* in having body smaller; testes round to oval and equal in size; ovary round to oval in shape with smooth to slightly irregular margins on midline or slightly to one or other side of body and separated from posterior testis by one loop of ascending uterus;

B. moorei J. Fred Denton and Elon E. Byrd, 1951^[5] recorded from *Bubo virginianus* of United states Texas differs from *B. jehangiri* in having body larger; ovary round to transversely oval in shape, smaller than testes, on either right or left side of the body and separated from posterior testis by one to three loops of uterus.

B. americanum J. Fred Denton and Elon E. Byrd, 1951^[5] recorded from *Buteo lineatus* of Athens differs from *B. jehangiri* weakly muscular acetabulum shows a shallow saucer like lumen.

B. exochocotyle J. Fred Denton and Elon E. Byrd, 1951^[5] recorded from *Taxstoma rujum* of Georgia differs from *B. jehangiri* in having smaller body; testes conspicuously large, transversely oval and located one immediately behind the other or with anterior one contiguous to or slightly overlapping zone of acetabulum; ovary oval in shape, located immediately behind posterior testis, lateral in position with outer margin pressed and against either right or left cecum.

B. microtesticulatum Timon-David, 1955^[8] recorded from *Larus argentatus* of Lake Duranku differs from *B. jehangiri* in having testes larger than ovary, rounded, tandem, slightly oblique and close to the ventral sucker; ovary oval and posttesticular; seminal receptacle voluminous, reaching size of the ovary and just post-ovarian.

B. andamanensis T. D Soota, C. B Srivastava and R. K Ghosh, 1972^[6] recorded from White collared of Maya bunder differs from *B. jehangiri* in having body smooth, thin, and elongated; maximum width in testicular or ovarian zone; posterior testis and intertesticular space; eggs yellow and elliptical.

B. attenuatum Jacob H. Fischthal and Robert E. Kuntz, 1974^[11] recorded from *Pycnonotus zeylanicus* of Kasiqui differs from *B. jehangiri* in having anterior testis somewhat sinistral; ovary somewhat sinistral.

B. stunkardi W. Patrick Carney, 1974^[10] recorded from *Nucifraga Columbian* of Patte Canyon, Missoula differs from *B. jehangiri* in having smaller body; oral sucker rounded in shape; anterior testis longer than posterior one. Both testes separated from ventral sucker, ovary, and each other by loops or loops of uterus; ovary rounded and posterior to the testis.

B. insulare Angel L. Madeline and Pearson, 1977^[14] recorded from *Rattus fuscipes* of Australia differs from *B. jehangiri* testes large, tandem, and contiguous or nearly so; anterior testis close to or overlapping posterior border of the acetabulum; ovary rounded.

B. podagri Angel L. Madeline and Pearson, 1977^[14] recorded from *Padargus strigoides* of Bridgewater differs from *B. jehangiri* in having testes rounded, contiguous, and slightly larger than ovary; anterior testis somewhat posterior to acetabulum.

B. hydromyos Angel L. Madeline and Pearson, 1977^[14] recorded from *Hydromy schry* of Australia differs from *B. jehangiri* in having body sub cylindrical and greatest width at the level of testis; oral sucker round; Uterus confined to inter-caecal of body.

B. dancelonis Angel L. Madeline and Pearson, 1977^[14] recorded from *Dacelo* of Bridgewater differs from *B. jehangiri* in having body length; testes are oval to rectangular with rounded corner.

B. strigosum J. K. Macko, V. Hanzelova and A. Mackova 1894^[9] recorded from *Cuculus canorus* of Hertnik differs from *B. jehangiri* in having testes rounded and longitudinally or transversely oval; anterior testis may partly overlap to ventral sucker or may be separated from it by uterus; posterior testis often larger than anterior one; ovary globular or oval, tandem in posterior testis and mostly separated from it by uterus; ovary sometimes situated closely posterior to the testis.

B. microfiliforme Salcedo L. Eduardo, 2003^[12] recorded from *Parus elegans* of Philippines differs *B. jehangiri* in having body size small; pre-oral space present; oral sucker rounded and larger in size; acetabulum rounded in shape and larger in size; distance between oral and ventral sucker is shorter; testes round to transversely oval, margin smooth, tandem and very close sometimes overlapping to each other, anterior testis lies very close to acetabulum; ovary transversely oval, close to or partly overlapping posterior testis and in tandem.

B. glareoli Hildebrand J. Okulewicz J. Popiolek. M, 2007^[13] recorded from Bank vole of Poland differs from *B. jehangiri* in having maximum body width at the level of vitellaria.

Conclusion

Present recorded trematodes differ from their congeners in body shape; size; shape of testes and distribution of uterus. On the basis of such morpho-metrical disparity, the new species is proposed as *Brachylecithum jehangiri*, which is new addition to the taxonomic studies and new host record in Pakistan.

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