Rev. Biol. Trop., 10(1): 99-110, 1962

On Ignavia breviovarica sp. nov., from the purple heron, Ardea purpurea (Linnaeus), with a note on the validity of Brijicola caballeroi Pande, 1960 (Trematoda: Echinostomatidae).

by

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(Received for publication June 17, 1962)

Family.— ECHINOSTOMATIDAE Looss, 1902 emend. Poche, 1925.
Subfamily.— Echinochasminae Odhner, 1911.
Ignavia breviovarica sp. nov.

About a dozen specimens of this echinostome parasite were collected from the ureters and kidneys of a Purple Heron, *Ardea purpurea* (Linnaeus), shot near Lucknow. A single specimen of this fluke was also obtained from the kidneys of the said avian host, shot at the outskirts of Hardoi.

The body (fig. 1) of the fluke is narrow and elongated with broad anterior and pointed posterior extremity. It is almost of a uniform width throughout its length and measures 4.570 - 6.951 mm in length and 0.462 - 0.751 mm in breadth in the testicular region. The anterior half of the body is beset with minute cuticular spines which are thickly set in the pre-testicular region and measure 0.013 - 0.015 mm by 0.002 - 0.005 mm.

The circumoral collar (fig. 2) is well developed and prominent at the sides of the oral sucker, but dorsally it is almost flushed with the body surface, while ventrally it is discontinuous. It is armed with twenty-one small and stout spines. Three to five of the collar spines on each side at the ventro-lateral angle show an alternate arrangement, while others are arranged in a single row. There is a wide gap in the row of the collar spines in the mid-dorsal line. These collar spines measure 0.021 - 0.029 mm by 0.011 - 0.012 mm.

The suckers are well developed. The terminal oral sucker measures 0.219 - 0.241 mm by 0.245 - 0.297 mm. The ventral sucker is situated in the anterior third of the body. It appears transversely oval and measures 0.329 - 0.390 mm by 0.360 - 0.495 mm.

The mouth leads, through a short prepharynx measuring 0.062 - 0.127 mm in length, into the pharynx which measures 0.122 - 0.175 mm by 0.114 - 0.170 mm.

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The oesophagus shows lateral outgrowths. It measures 0.470 - 0.621 mm in length and bifurcates into the intestinal caeca about 0.091 - 0.227 mm in front of the ventral sucker. The intestinal caeca run up to the posterior end of body.

The testes are small, entire, and tandem. They vary in shape from being oblong to round, and are situated in the posterior region of the anterior half of body. The anterior testis measures 0.208 - 0.235 mm by 0.195 - 0.305 mm, whereas the posterior one measures 0.301 - 0.311 mm by 0.279 - 0.286 mm. The cirrus sac (fig. 3) appears pear-shaped and measures 0.167 - 0.210 mm by 0.079 - 0.121 mm. It is situated in front of the ventral sucker, or may partly overlap the anterior border of the sucker. The major part of the cirrus sac is occupied by a large bipartite seminal vesicle, the proximal part of which is larger than the distal part. The pars prostatica is short and surrounded with prostatic gland cells. The ejaculatory duct is short. The common genital pore is median or submedian, situated in front of the ventral sucker.

The ovary is pre-testicular and dextral in position. It is small, ovoid to subglobular in shape, and measures 0.056 - 0.109 mm by 0.118 - 0.120 mm. The vitellaria are moderately developed. The vitelline follicles are small and extend laterally from the level of the posterior border of the ventral sucker up to the hind end of the body. The follicles are mostly extra-caecal. The vitelline reservoir and the Mehlis' gland are situated immediately behind the ovary. The Laurer's canal is present. A receptaculum seminis is absent, but sperms are present in the initial coils of the uterus, which thus form a receptaculum seminis uterinum. The uterus consists of a few transverse coils which are confined to the intercaecal field between the ventral sucker and the ovary, and ultimately it opens to the outside by the common genital pore. The eggs are oval, operculated, and measure 0.1025 - 0.1148 mm by 0.0651 - 0.0800 mm.

The excretory system consists of a median six-chambered excretory bladder situated behind the testes (fig. 1). The lateral excretory cornua join the foremost chamber of the bladder. The last chamber of the bladder is the smallest and, through a short narrow duct, opens to the exterior by the terminal excretory pore.

DISCUSSION

FREITAS (2) created the genus *Ignavia* with *Ignavia venusta* as the genotype for some echinostomes, which he obtained from the ureters of *Casmerodius albus egretta* (Gmelin) and *Leucophoyx thula thula* (Molin) in Brazil. He also included *Echinostomum* sp. inq. Dietz, 1909 in the genus *Ignavia* under the name of *Ignavia inops* without giving any discussion.

OSCHMARIN and BELOUSS (3) obtained some echinostomes from the ureters of *Aquila clanga* Pallas in Russia and, being unaware of the existence of Freitas' genus *Ignavia,* they created the genus *Nephroechinostoma* for these echinostomes with *Nephroechinostoma aquilae* as the genotype. YAMAGUTI (8) dropped the genus *Nephroechinostoma* Oschmarin and Belouss, 1951 as a synonym of *Ignavia* Freitas, 1948, and hence transferred the genotype *N. aquilae* to the genus *Ignavia.* After a careful study of the genera *Ignavia* and *Nephroe-*

chinostoma the present writer is in complete agreement with YAMAGUTI (8) in regarding the latter genus as a synonym of the former.

SCHEWTSCHENKO (5) described *Nephroechinostoma ardeae* from the ureters of *Ardea cinerea* (Linnaeus) in Russia. YAMAGUTI (8) did not mention this species in his monographic work, and apparently was unaware of its publication. The present writer regards it a valid species which should come under *Ignavia* as *I. ardeae* (Schewtschenko, 1954) nov. comb.

WRIGHT (7) transferred the species *Allechinostomum renale* Yeh, 1954 to the genus *Ignavia* and proposed to exclude the species *I. inops* (Dietz, 1909) Freitas, 1948 from this genus. YAMAGUTI (8) seems to have supported Wright's view, since he included *A. renale* Yeh, 1954 in the genus *Ignavia* and excluded *I. inops* from the list of valid species of *Ignavia* given by him in his *Systema Helminthum.* The present writer agrees with WRIGHT (7) and YAMAGUTI (8) in transferring the species *A. renale* Yeh, 1954 to the genus *Ignavia,* because the papilla-like projection, through which the male genital duct opens into the genital atrium in the genus *Allechinostomum* Odhner, 1911, has not been described in this species. The original account of *Echinostoma* sp. inq. Dietz, 1909, for which FREITAS (2) proposed the name *I. inops,* is incomplete and further, the specimens, on which DIETZ (1) based his description, lacked the collar spines (except the ventral angle spines in one specimen). Consequently, the inclusion of this form *(Echinostoma* sp. inq. Dietz, 1909) under *Ignavia* by FREITAS (2) is uncalled for. The writer, therefore, agrees with WRIGHT (7) and YAMAGUTI (8) in excluding it from the genus *Ignavia.* It should be retained under the genus *Echinostomum* Rudolphi, 1809 as a *species inquirenda* till it is redescribed from fresh specimens.

From the foregoing account it is evident that the genus *Ignavia* Freitas, 1948 contains the following species: *I. venusta* Freitas, 1948, *I. aquilae* (Oschmarin and Belouss, 1951) Yamaguti, 1958, *I. renale* (Yeh, 1954) Wright, 1957, and *I. ardeae* (Schewtschenko, 1954) nov. comb.

The chambered excretory bladder and small ovary distinguish the present form from all these species. It further differs from the genotype *I. venusta* in having a receptaculum seminis uterinum in place of a true receptaculum seminis; from *I. renale* in having much smaller collar spines, larger eggs, and entire testes in place of lobed testes; and from *I. ardeae* in having much larger testes. It may also be pointed out that *I. venusta* and *I. renale* are much larger in size, being three times longer than the present form.

It is thus evident that the present form represents a new species of the genus *Ignavia* Freitas, 1948, and the name *I. breviovarica* is proposed for it.

EMENDED DIAGNOSIS OF THE GENUS **IGNAVIA** FREITAS, 1948.

Since the generic diagnosis of *Ignavia,* as given originally by FREITAS (2), is inadequate, an emended diagnosis is given below:

Echinostomatidae; Echinochasminae: Body narrow, elongated, and spinose. Circumoral collar well developed at the side, while dorsally it runs as a low ridge.

It is armed with a dorsally interrupted row of 20 to 22 spines. Suckers well developed. Ventral sucker larger than the oral sucker, and situated in anterior third of body. Prepharynx and pharynx present. Oesophagus long, with or without lateral diverticula. Intestinal caeca long, extending up to posterior end of body. Testes tandem, lobate or entire. Cirrus sac small, situated in front of ventral sucker. It contains a bipartite seminal vesicle, a short pars prostatica, and a ductus ejaculatorius. Genital pore situated between ventral sucker and intestinal bifurcation. Ovary pre-testicular, median or submedian. Vitellaria mostly extra-caecal, extending form the region of the ventral sucker up to the hind end of body. A true receptaculum seminis may be present or absent. Laurer's canal and Mehlis' gland present. Uterus confined to inter-caecal region between ventral sucker and gonads. Eggs few, large, and operculate. Excretory bladder simple or chambered. Excretory pore terminal. Parasites of kidneys and ureters of birds.

Type species:— *Ignavia venusta* Freitas, 1948.

A KEY TO THE SPECIES OF THE GENUS **IGNAVIA** FREITAS, 1948.

1. Excretory bladder chambered ..... *I. brevioυarica* sp. nov.
   Excretory bladder not chambered. ..... 2.
2. Collar spines 22. ..... *I. aquilae* (Oschmarin and Belouss. 1951) Yamaguti, 1958.
   Collar spines 20. ..... 3.
3. Testes small, almost of the size of ovary. ..... *I. ardeae* (Schewtschenko, 1954) nov. comb.
   Testes large, about double the size of ovary..... 4.
4. Oesophagus short. Testes lobed ..... *I. renale* (Yeh, 1954) Wright, 1957
   Oesophagus very long. Testes entire ..... *I. venusta* Freintas, 1948.

A NOTE THE SYSTEMATIC POSITION OF GENUS **IGNAVIA** FREITAS, 1948.

FREITAS (2) placed the genus *Ignavia* under the subfamily Echinochasminae Odhner, 1911. SKRJABIN and BASCHKIROVA (6) placed it under the subfamily Echinostomatinae Odhner, 1911. YAMAGUTI (8) established a new subfamily Ignaviinae for this genus, chiefly on the character of the circumoral collar which is well developed at the sides of the oral sucker appearing as lateral lobes. In the opinion of the present writer, this characters is of generic importance, and is insufficient for the creation of a separate subfamily. The present writer, therefore, proposes to drop the subfamily Ignaviinae Yamaguti, 1958 and to reinstate the genus *Ignavia* to its original place under the subfamily Echinochasminae. The facts that the row of collar spines has a dorsal chasma and the seminal vesicle is bipartite in *Ignavia* fully justify placing this genus under Echinochasminae and not under Echinostomatinae, as it has been done by SKRJABIN and BASCHKIROVA (6).

A NOTE ON THE VALIDITY OF **BRIJICOLA CABALLEROI** PANDE, 1960.

PANDE (4) collected a fluke from the bursa fabricii of the Little Egret, *Egretta garzetta garzetta* (Linnaeus) in the Mathura District of Uttar Pradesh and created the genus *Brijicola* with *Brijicola caballeroi* as the genotype for this fluke. The present writer himself collected about six dozen specimens of this fluke from the same location of the same avian host in the environs of Anupshahr in the Bulandshahr District of Uttar Pradesh and in Lucknow. On a critical study of Pande's description of this fluke supplemented with a careful examination of the specimens collected by himself, the writer has found that the important features of this fluke are as follows:

1. Body small, elongated, slightly curved, and spinose.

2. A reniform circumoral collar is present in the form of a prominent, but ventrally incomplete, ridge around the anterior end of body; and it is armed with a dorsally interrupted row of twenty-four spines which are almost equal in size.

3. The suckers are well developed; the ventral sucker is considerably larger than the oral sucker, and is situated at about one-third of body length from anterior end.

4. A short prepharynx is present; pharynx is muscular and larger than the oral sucker; oesophagus is well developed; intestinal caeca are narrow, extend almost up to the hind end of the body.

5. Testes are large, entire, tandem, almost equal in size, and are situated in the posterior half of body.

6. Cirrus sac is large and muscular, and mostly lies in front of the ventral sucker, never extending behind the middle of the sucker; seminal vesicle is a large bipartite structure.

7. Common genital pore is in front of ventral sucker, between the sucker and oesophageal bifurcation.

8. Ovary is pre-testicular, small, and oval or subglobular.

9. Vitellaria are extensively developed with large follicles extending behind from the pharyngeal level to hind end of body; follicles of the two sides being confluent anteriorly as well as posteriorly, and also tending to merge in the ovarian region.

10 A true receptaculum seminis is absent, but a receptaculum seminis uterinum is present.

11. Uterus is long with several eggs; it descends into post-testicular region of the body where it forms one or a few coils, and then ascends to open into the common genital aperture; eggs are elliptical, light yellow, and operculate.

All above features of *B. caballeroi* Pande, 1960 tally with the characters of the echinostome genus *Saakotrema* (Saakova, 1952) Skrjabin and Baschkirova, 1956, the existence of which was apparently unknown to PANDE (4). The writer, therefore, drops the genus *Brijicola* into synonymity with Saakotrema.

The genus *Saakotrema* is still monotypic, containing no other species

besides the genotype, *Saakotrema metatestis* (Saakova, 1952) Skrjabin and Baschkirova, 1956. On the basis of above mentioned characters the writer is fully convinced that the fluke described by PANDE (4) is not only congeneric, but even identical with *Saakotrema metatestis*. The truth of this statement is further illustrated by the following chart of measurements:

	Original specimens of *Saakotrema metatestis*. (mm)	Specimens described by PANDE (4) (mm)	Specimens collected by present writer. (mm)
Body	2.34 x 0.63	1.8-1.9 x 0.62	1.5-2.47 x 0.45-0.58
Collar spines	0.042 long.	0.031 x 0.012	0.026-0.036 x 0.007-0.011
Oral sucker	0.06 in diameter	0.075 x 0.058	0.04-0.055 x 0.054-0.061
Ventral sucker	0.27 x 0.30	0.28-0.285 in diameter.	0.251-0.282 x 0.244-0.282
Pharynx	0.08 x 0.12	0.112-0.119 x 0.074-0.075	0.089-0.105 x 0.068-0.088
Anterior testis	0.39 x 0.36	0.314-0.316 in diameter.	0.251-0.322 x 0.253-0.31
Posterior testis	0.324 x 0.45	0.314-0.316 in diameter.	0.311-0.345 x 0.27-0.321
Ovary	0.124 x 0.108	0.14-0.16 in dia.	0.117-0.15 x 0.108-0.12
Eggs	0.078-0.084 x 0.03-0.042.	0.082 x 0.044	0.0745-0.0843 x 0.0418-0.0476

Thus, according to the present writer, the fluke described by PANDE (4) under the name of *Brijicola caballeroi* is not a valid species and should be dropped as a synonym of *Saakotrema metatestis* (Saakova, 1952) Skrjabin and Baschkirova, 1956.

SYSTEMATIC POSITION OF THE GENUS **SAAKOTREMA** (SAAKOVA, 1952) SKRJABIN AND BASCHKIROVA, 1956.

The genus *Saakotrema,* a generic name suggested by SKRJABIN and BASCHKIROVA (6) as a substitute for *Opisthometra** under which it was originally described by Saakova, was assigned to the family Echinostomatidae Looss, 1902

emend. Poche, 1925 by Saakova; SKRJABIN and BASCHKIROVA (6) included *Saakotrema* under the echinostomatid subfamily Echinochasminae Odhner, 1911. PANDE (4), describing the same fluke under a different generic name, *Brijicola,* overemphasized the importance of a post-testicular extension of the uterus in this fluke and overlooked its typical echinostome affinity in all other features. Consequently, he confused this form with a number of distome genera belonging to such diverse families as Acanthocolpidae Lühe, 1910; Acanthostomatidae Poche, 1925 emend. Nicoll, 1935; Maseniidae Yamaguti, 1953; Heterophyidae Odhner, 1914; Plagiorchiidae Lühe, 1910 emend. Ward, 1917, and Deropristidae Skrjabin, 1958. Under such a confusing state, PANDE (4) allocated the fluke in question to the family Acanthocolpidae Lühe, 1910, but simultaneously stated: "The present form appears co-familial with only such genera of Acanthocolpidae as *Stephanostomum* and *Pristicola*".

Although it is true that a post-testicular extension of uterus is an unusual character for an echinostome parasite, but in view of a very close affinity of the fluke, presently under consideration, with the various genera, more particularly the genus *Episthmium* Lühe, 1910, of the subfamily Echinochasminae in all other characters, it appears unwarranted to assign the genus *Saakotrema* to any other family than Echinostomatidae merely on the basis of this one character (of extension of uterus in post-testicular region of body). Moreover, judging from the very compact body of *S. metatestis,* with no significant space left between the ventral sucker and the gonads, owing to the large size of testes, it may be well presumed that the post-testicular extension of the uterus in this form is merely a secondary re-adjustment for accomodation of the uterus. The present writer, therefore, retains the genus *Saakotrema* (Saakova, 1952) Skrjabin and Baschkirova, 1956 in its original place under the subfamily Echinochasminae Odhner, 1911 of the family Echinostomatidae Looss, 1902 emend. Poche, 1925.

A NOTE ON THE EXCRETORY SYSTEM OF **SAAKOTREMA METATESTIS** (SAAKOVA, 1952) SKRJABIN AND BASCHKIROVA, 1956.

The description of *S. metatestis* as given originally by Saakova and by PANDE (4) is quite adequate in all details, but the excretory system was not apparently studied in detail by these workers. PANDE (4), however, mentioned that the terminal excretory pore leads into a Y-shaped excretory bladder through a prominent and nearly spherical chamber, whose cavity continues into the main stem of the bladder. The present writer had an opportunity of collecting some immature specimens of this fluke in the Laboratory at Lucknow, and the excretory system was studied in these immature specimens in living condition. The structure of the excretory bladder was found to be much more complicated than what has been described by PANDE (4). The main stem of the bladder (fig. 4) is divided into six distinct chambers, each opening into the one behind it by a

* This change in nomenclature was necessary because the generic name *Opisthometra* was pre-occupied for a trematode of the family Heterophydae Odhner, 1914.

narrowed end. The first chamber receives the two lateral excretory cornua, whereas the last one has a thick muscular wall, probably acts as a strong sphincter, and opens to the exterior through a wide terminal excretory pore.

ACKNOWLEDGMENTS

The author's thanks are due to Prof. M. B. Lal and to Dr. S. C. Baugh of Lucknow University for their guidance.

SUMMARY

Ignavia breviovarica sp. nov. is described from the ureters and kidneys of the Purple Heron, *Ardea purpurea* (Linnaeus) from India. The genus *Ignavia* Freitas, 1948 is briefly reviewed, its diagnosis is emended, and a key is given to differentiate its valid species. The systematic position of the genus is also discussed.

The genus *Brijicola* Pande, 1960 is shown to be synonymous to the genus *Saakotrema* (Saakova, 1952) Skrjabin and Baschkirova, 1956. *Brijicola caballeroi* Pande, 1960 is also dropped in synonymity with *Saakotrema metatestis* (Saakova, 1952) Skrjabin and Baschkirova, 1956. The systematic position of *Saakotrema* is discussed. The excretory system of *S. metatestis* is redescribed.

RESUMEN

Se describe *Ignavia breviovarica* sp. nov. de los uréteres y riñones de una garza, *Ardea purpurea* (Linnaeus) de la India. Se revisa brevemente el género *Ignavia* Freitas, 1948, su descripción es enmendada, y se presenta una llave para las especies válidas. La posición sistemática del género es asimismo discutida.

Se demuestra que el género *Brijicola* Pande, 1960 es sinónimo de *Saakotrema* (Saakova, 1952) Skrjabin & Baschkirova, 1956. *Brijicola caballeroi* Pande, 1960 es colocado en sinonimia de *Saakotrema metatestis* (Saakova, 1952) Skrjabin & Baschkirova, 1956. Se discute la posición sistemática de *Saakotrema* y por último se redescribe el sistema excretor de *S. metatestis.*

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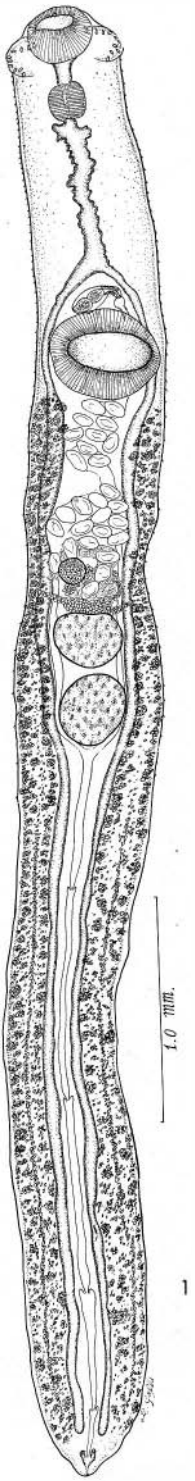
Figs. 1-3. *Ignavia breviovarica,* sp. nov.

Fig. 1. Type specimen, ventral view.

Fig. 2. Anterior end of type specimen, ventral view.

Fig. 3. Detail of type specimen, showing cirrus sac and associated structures.

Fig. 4. *Saakotrema metatestis* (Saakova, 1952) Skrjabin and Baschkirova, 1956, posterior part of a young specimen in living condition showing excretory bladder only.



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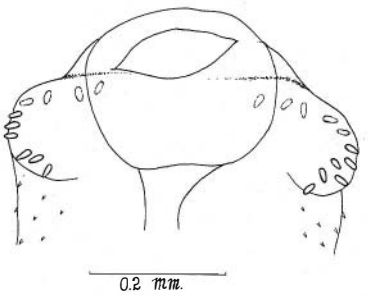

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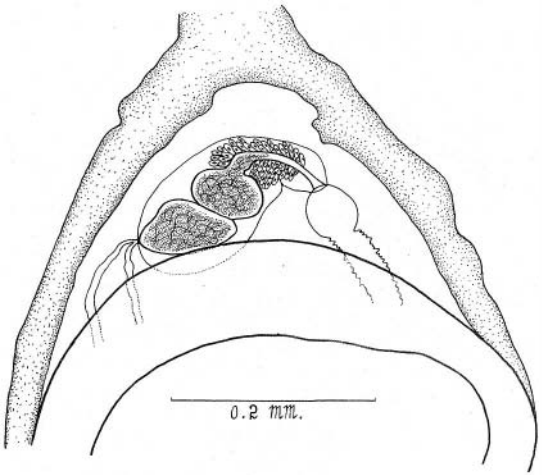

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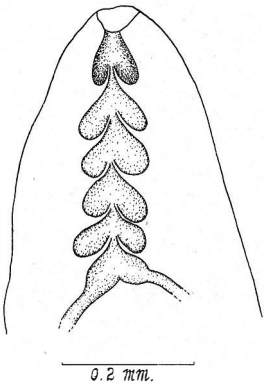

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