

TWO NEW SPECIES OF AVIAN TREMATODES

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A SINGLE specimen of a fluke of the genus *Prosthogonimus* was found in the alimentary canal of a House Sparrow, *Passer domesticus* (Linn.). The specimen is sexually mature. On examination, I found that it represents a new species of the genus. Unfortunately the description is based on only a single specimen.

Prosthogonimus macroacetabulus n. sp.

(TEXT-FIG. 1)

Body elongately oval with anterior end bluntly pointed, posterior end broad. Laterally the worm is convex on the left side and concave on the

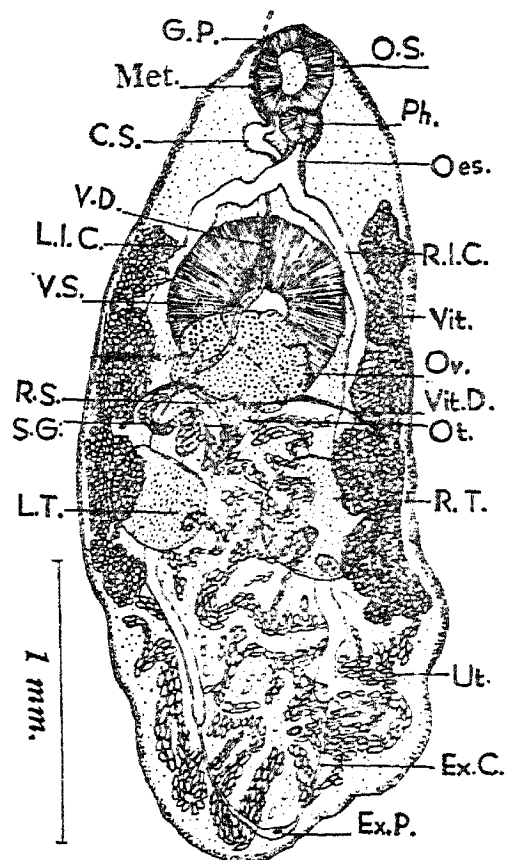


FIG. 1. *Prosthogonimus macroacetabulus* n.sp. Dorsal view

C.S., cirrus sac; Ex. C., Excretory canal; Ex.P., Excretory pore; G.P., Genital pore; L.I.C., Left intestinal caecum; L.T., Left testis; Met., Metraterm; Oes., Oesophagus; O.S., Oral sucker; Ot., Oötype; Ov., Ovary; Ph., Pharynx; R.I.C., Right intestinal caecum; R.S., Receptaculum seminis; R.T., Right testis; S.G., Shell gland; Ut., Uterus; V.S., Ventral sucker; Vit., Vitellaria; Vit.D., Vitelline duct.

right. Maximum length of the body 2.94 mm. and maximum width 1.22 mm. in the posterior region of the body. Cuticular spines irregularly distributed all over the body, being more numerous at the anterior end, measuring 8–12 μ in length. Oral sucker (O.S.), more or less, oblong, sub-terminal and smaller than the ventral sucker. It measures 0.38 mm. by 0.272 mm. Ventral sucker (V.S.) lies immediately behind the intestinal bifurcation and touches laterally the two intestinal cæca. The distance between the point of the intestinal bifurcation and the anterior end of the acetabulum is 0.119 mm. The ventral sucker lies in the posterior portion of the anterior half of the animal and at a distance of 0.68 mm. from the anterior end of the body. It is round in shape and measures 0.64 mm. by 0.63 mm. The ratio of the oral sucker to ventral sucker is 1 : 2.34. Prepharynx absent. The oral sucker is immediately followed by a small bulbous highly muscular pharynx (Ph.) measuring 0.119 mm. in length and 0.13 mm. in width. Œsophagus (Œs.) is extremely small, hardly measuring 0.068 mm. in length. It bifurcates at a distance of approximately 0.56 mm. from the anterior end into two intestinal cæca (L.I.C. and R.I.C.), which are slightly sinuous and extend beyond the testes in the posterior region, the left one being slightly longer than the right.

Testes (R.T., L.T.) oval, slightly unequal, in the anterior portion of the posterior half of the body, partly supracæcal and post-ovarian. The vasa efferentia meet into a common duct at the level of the middle of the acetabulum, the common duct continuing in the cirrus sac (C.S.) which begins on the anterior border of the acetabulum. The left testis (L.T.) measures 0.35 mm. \times 0.34 mm., the right (R.T.) 0.425 mm. \times 0.40 mm. The cirrus sac is very sinuous and elongated, running to the left of the Œsophagus, pharynx and the oral sucker. The metraterm (Met.) runs nearly parallel to the left of the cirrus sac and both open on the left of the oral sucker at the anterior end of the animal. The details of the coiling of the vas deferens in the cirrus sac and the nature of pars prostatica could not be made out.

Ovary (Ov.) transversely elongate, almost median, irregularly spherical and distinctly follicular measuring 0.30 mm. \times 0.49 mm. A greater part of the ovary lies on the ventral posterior portion of the acetabulum. Receptaculum seminis (R.S.) and Oötype (Ot.) immediately posterior to ovary; shell gland (Mehli's gland) (S.G.) and Laurer's canal present. Vitellaria arranged in definite follicular clusters lying on the lateral sides of the body of the animal on the intestinal cæca. They are asymmetrical and begin at the level of the bifurcation of the intestine and extend beyond the testes but terminate much anteriorly than the termination of the intestinal cæca. The follicles on the left side are arranged in four groups and begin at the level

of the anterior end of acetabulum, comparatively a little posterior to those on the right side. Those on the right side are in five groups and begin at the level of the intestinal fork. Follicles on the right side also extend a little more posteriorly than those on the left side. The vitelline field partly overlaps the testes in the testicular region. The vitelline duct (Vit. D.) runs transversely at the level of the posterior border of the acetabulum. Uterus (Ut.) greatly coiled, the coils in the post-acetabular region being heavy. There are no pre-acetabular coils.

The excretory system (Ex.P.) is extremely interesting being V-shaped, not Y-shaped as in other species of the genus. The excretory pore (Ex.P.) lies sub-terminally at the posterior end.

Eggs typical of the genus. Uterine eggs (in mounted specimen) oval with posterior spine, measuring $18-26 \times 5-12 \mu$.

Macy (1934b) gives a key to the species of the genus *Prosthogonimus* holding only 16 of the described species as valid. He excluded *P. longusmorbificans* Siefried, 1923, from his key on the ground that it was named in contravention of the international rules of nomenclature but included in his key the three species *P. skrjabini*, *P. karausiaki* and *P. horiuchii* which he considered as synonyms of some other species already included by him in his key.

Since the publication of Macy's paper, other species of the genus have been described, viz., *P. leei* Hsu., 1935, *P. folliculus* Reid and Freeman, 1935, and *P. indicus* Srivastava, 1937.

I have given below a key to all the species of the genus including *P. longusmorbificans*, along with the new species described in this paper and have excluded from my key the three species *P. skrjabini*, *P. karausiaki* and *P. horiuchii* on the ground that the first two are synonymous with *P. anatinus* and the third with *P. putschkowskii*.

The original description of *P. leei* and *P. longusmorbificans* were not available to me. Therefore I have relied on such specific characters of these species as given by Macy (1934) and Srivastava (1938).

Key to the species of the genus *Prosthogonimus* Lühe, 1899.

(syn. *Prymnoprion* Looss, 1899)

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|----|--|----|----|---|
| 1. | (6) Suckers approximately of the same size | .. | .. | 2 |
| 2. | (4) (5) Cirrus pouch not extending posterior to the level of intestinal bifurcation. Vitellaria begin below the level of the intestinal bifurcation, at the level or below the level of the ventral sucker | .. | .. | 3 |

3. Cirrus pouch very sinuous. Vitellaria begin in the region of ovary, anterior margin being considerably behind the level of the posterior margin of ventral sucker *japonicus* Braun, 1901.
 Cirrus pouch not sinuous. Vitellaria begin at the level of the ventral sucker. . . . *pellucidus* von Linstow, 1873.
4. (2) (5) Cirrus sac extending past the intestinal bifurcation but not reaching the acetabulum. Vitellaria begin at the level of the intestinal bifurcation. *folliculus* Reid and Freeman, 1935.
5. (2) (4) Cirrus pouch reaching nearly to acetabulum. Vitellaria begin below the level of intestinal bifurcation, at the anterior border of the ventral sucker. . . . *furcifer* Railliet, 1924.
6. (1) Ventral sucker at least a half larger than the oral sucker 7
7. (15) Ovary dorsal to ventral sucker or at least considerably overlapping it 8
8. (10). Uterus with heavy pre-acetabular coils 9
9. Vitellaria extending much posterior to testes. . . . *ovatus* Rudolphi, 1803 (Type species).
 Vitellaria not reaching the posterior margin of the tests. . . . *dogiele* Skrjabin, 1914.
10. (8). Uterus without heavy pre-acetabular coils 11
11. (13). Cirrus sac reaching the acetabulum, œsophagus extremely small 12
12. Vitellaria restricted, post-acetabular. . . *leei*. Hsu., 1935.
 Vitellaria not restricted to post-acetabular region. . . *macroacetabulus* n. sp.
13. (11). Cirrus sac extending below intestinal bifurcation but not reaching to acetabulum 14
14. Testes and vitellaria confined to anterior half of body. . . *vitellatus* Nicoll, 1915.
 Testes not in the anterior region. Vitellaria not confined to anterior half. . . *indicus* Srivastava, 1937.
15. (7) Ovary definitely posterior to ventral sucker 16

16. (20) Cirrus pouch reaching ventral sucker 17
17. (18) Ventral sucker situated immediately after the intestinal fork .. *brauni* Skrjabin, 1919.
18. (17) Ventral sucker situated at some distance posterior to the intestinal fork 19
19. Sucker ratio nearly 1:1.5. *longusmorbificans* Siefried, 1923
Sucker ratio 1:1.23. *putschkowskii* Skrjabin, 1913.
20. (16) Cirrus pouch not reaching ventral sucker 21
21. (22) Anterior border of vitellaria definitely post-acetabular. Testes located at the middle of the longitudinal body axis .. *anatinus* Markow, 1902.
22. (21) Vitellaria begin at the level of the acetabulum. Testes post ovarial 23
23. (24) Vitellaria ending at or before the posterior margins of testes. *macrorchis* Macy, 1934.
24. (23) Vitellaria extend much posterior to testes 25
25. (26) Coils of the uterus not reaching lateral portions of the body, entirely inter-cæcal. *rudolphii* Skrjabin, 1919.
26. (25) Uterine coils extending laterally over the intestinal cæca and filling most of the posterior half of body .. 27
27. Cirrus sac reaching intestinal fork, nearly straight; ratio between the oval and ventral sucker as 1:2. *cuneatus*. (Rudolphi, 1809).
Cirrus pouch extends farther, very sinuous; ratio between the oral and ventral suckers as 1:3. *fuelleborni* Skrjabin and Massino, 1925.

2. *Eumegacetes microdiosus* n. sp.

(Text-Fig. 2)

A single specimen of this fluke belonging to the genus *Eumegacetes* Looss, 1900, was found in the alimentary canal of black-headed Maina, *Temenuchus pagodarum* (Gm.). The specimen is sexually mature. A study of the worm reveals that it is a new species of the genus.

Body elongately oval with rather blunt anterior end and slightly pointed posterior one. Maximum length of the body is 3.35 mm. and maximum width 1.66 mm. in the region of the acetabulum. Suckers large.

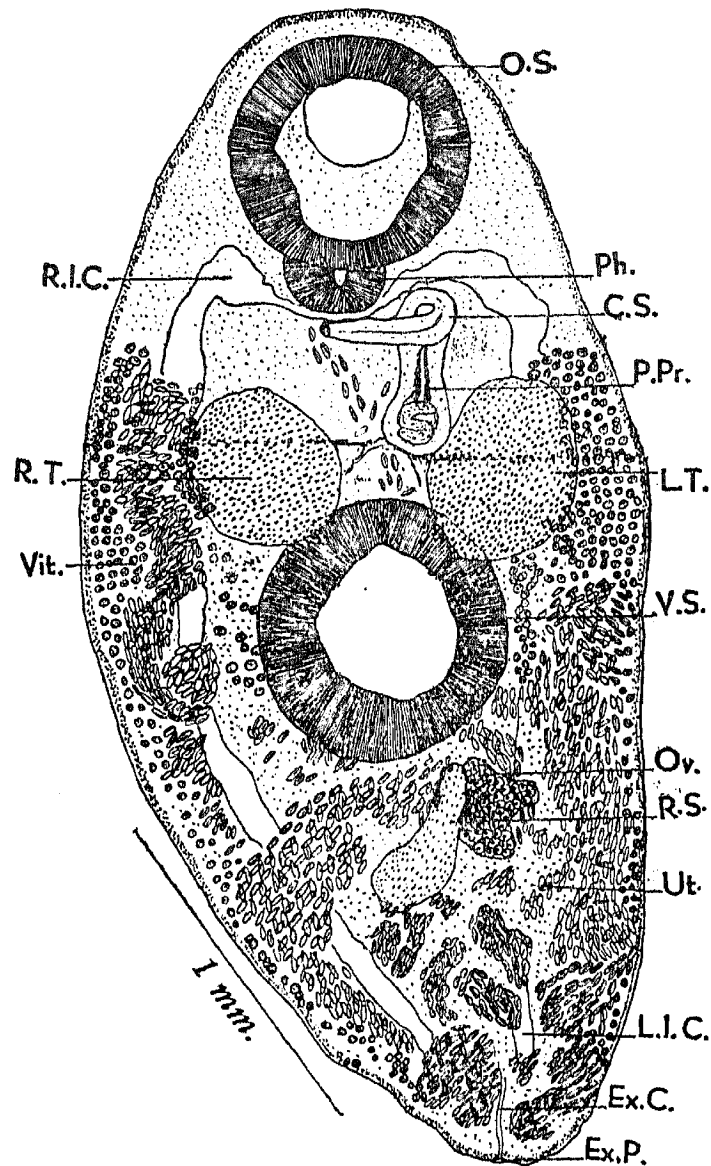


FIG. 2. *Eumegacetes microdiosus* n. sp., Dorsal view.
P.Pr., Pars prostatica; Other lettering as in Fig. 1.

Oral sucker (O.S.) is entirely sub-terminal, being situated at a distance of 0.08 mm. from the anterior end of the animal and measures 0.66 mm. \times 0.67 mm. The posterior sucker (V.S.) slightly posterior to the middle of the body length and lies much posterior to the intestinal bifurcation and measures 0.74 mm. \times 0.70 mm. The ratio of the ventral sucker to the oral sucker is 1:0.95. The ventral sucker lies at a distance of 1.40 mm. from the anterior end. Prepharynx absent. Pharynx (Ph.) strong, semi-circular, measuring 0.12 mm. by 0.29 mm. Œsophagus entirely absent. The intestinal cæca (L.I.C. and R.I.C.) are long and are at first transversely disposed and later bend to run in the usual manner nearly to the posterior end of the body.

Testes (R.T. and L.T.) are spherical, preovarian, inter-cæcal and are almost symmetrically situated. The left testis is slightly bigger and more elongated than the right one measuring 0.50 mm. \times 0.43 mm. The right testis (R.T.) measures 0.45 mm. \times 0.43 mm. The testes, particularly the left one, are slightly supra-acetabular. The two vasa efferentia are distinct, the right one seems to be slightly longer than the left. Cirrus sac (C.S.) is very long and sinuous lying close to the left. The approximate length of the cirrus sac is 1.18 mm. and maximum width in the basal region 0.16 mm. It is saccular at the base. The cirrus sac just below the intestinal cæcum on the left side bends on itself and runs transversely to the body to open immediately behind the pharynx. Pars prostatica (P.Pr.) present.

Ovary (Ov.) irregularly shaped, post-acetabular, inter-cæcal, situated slightly to the left side. It is longer than broad. Shell gland (S.G.) present. Receptaculum seminis (R.S.) is pear-shaped lying on the right side of the ovary. Its wider portion is directed posteriorly and the pointed end anteriorly. Uterine coils (Ut.) very heavy, practically overlapping the whole intestinal cæca and partly vitellaria also. The genital pore opens at the level of the posterior end of the pharynx slightly to the right side. Vitellaria (Vit.) are symmetrical and begin in the pre-testicular zone, overlap the intestinal cæca and terminate a little distance beyond the hinder ends of the intestinal cæca. Excretory system Y-shaped with a short stem. Eggs pointed, measuring $29 \times 13 \mu$.

Discussion

Mehra (1935) gives a key to the species of the genus *Eumegacetes* Looss, 1900.

The species described in this paper differs from *E. contribulans* Braun, 1901, *E. medioximus* Braun, 1901 and *E. braunii* Mehra, 1935, in the extent of the vitellaria, which in this species extend anterior to testes. The new species also differs from *E. braunii* in the position of the ovary which is situated much anterior to the termination of the intestinal cæca. The present species resembles *E. perodiosus* Travassos, 1922 in the extent of vitellaria. It, however, differs from it in having the ventral sucker larger than the oral sucker.

E. microdiosus n. sp. further differs from *E. perodiosus* in the fact that the testes are pre-equatorial, though it resembles *E. emendatus* Braun, 1900 and *E. artamii* Mehra, 1935 in this respect. It differs from *E. artamii* in having the acetabulum unequal and from *E. emendatus* in the cirrus sac being not U-shaped. Unlike *E. artamii*, the testes are partly supra-acetabular in the new species.

Eumegacetes microdiosus n. sp.

Specific diagnosis.—*Eumegacetes* Looss, 1900 syn. *Megacetes* Looss, 1899.

With generic characters. Body elongately oval, anterior end blunt, posterior end pointed, measuring 3.35 mm. \times 1.66 mm. Oral sucker sub-terminal 0.66 mm. \times 0.67 mm. Posterior sucker partly equatorial 0.74 mm. \times 0.70 mm. Sucker ratio of the ventral sucker to the oral 1:0.95. Pharynx semicircular 0.12 mm. \times 0.29 mm. Testes spherical, pre-equatorial, partly supra-acetabular. The right one is smaller than the left, measuring 0.45 mm. \times 0.43 mm. The left measures 0.50 mm. \times 0.43 mm. Cirrus sac long, sinuous and coiled upon itself to form a loop and afterwards runs transversely. Ovary posterior to acetabulum. Receptaculum seminis pear-shaped with the broad end posteriorly directed. Vitellaria begin in the pre-equatorial region and extend much posteriorly. Excretory system Y-shaped. Eggs pointed measuring (maximum) $29 \times 13 \mu$.

Host: Black-headed Maina (*Temenuchus pagodarum*) (Gm.)

Location: Alimentary canal.

Locality: Nagpur, C.P., India.

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