

ON TWO SPECIES OF THE GENUS *DIASCHISTORCHIS* JOHNSTON,
1913 (TREMATODA: PRONOCEPHALIDAE) FROM MARINE TURTLES
IN INDIA

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ABSTRACT

This paper deals with the description of a new trematode, *Diaschistorchis mannarensis* n. sp. the validity of which has also been discussed. *D. pandus* (Braun, 1901) Johnston, 1913 has been recorded. Key to the species of the genus *Diaschistorchis* Johnston, 1913 is provided.

Subfamily Diaschistorchiinae Yamaguti, 1958
Genus *Diaschistorchis* Johnston, 1913
Syn. *Wilderia* Pratt, 1914
Synechorchis Barker, 1922

Diaschistorchis mannarensis n. sp.
(Figs. 1-4)

Five specimens of *Diaschistorchis mannarensis* n. sp. were recovered from the intestine of 2 marine turtles, *Chelone mydas* (Linn.), collected from the Gulf of Mannar (Pamban, Tamil Nadu).

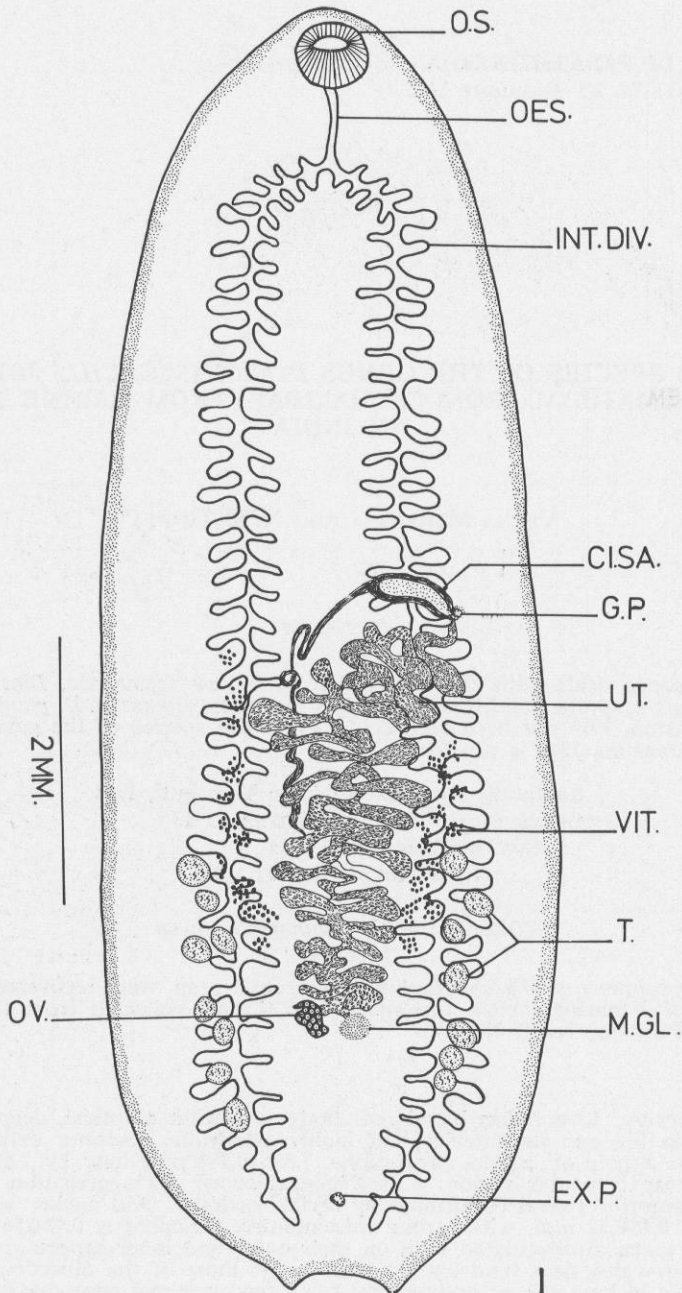
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DESCRIPTION: Live flukes blood red; body somewhat elliptical, deeply concave ventrally in life and its anterior half highly extensible, posterior extremity provided with a pair of conical projections, 7.315-10.384 mm long by 2.695-3.41 mm broad across testicular region. Collar inconspicuous, no aggregation of muscle fibres in anterior region (confirmed by serial sections). Oral sucker subterminal, 0.44-0.56 x 0.46-0.58 mm, with strong musculature. Oesophagus 0.42-0.56 mm long. Intestinal caeca diverticulated both on their outer and inner aspects, reaching up to and converging near hind extremity of body; most of the diverticula directed transversely to long axis of body except for a few proximal ones that are oblique.

Excretory pore dorsal, a little in front of posterior extremity of body. Excretory vesicle in form of an irregular small bladder extending up to halfway between excretory pore and ovary; from each side of the excretory vesicle at about its

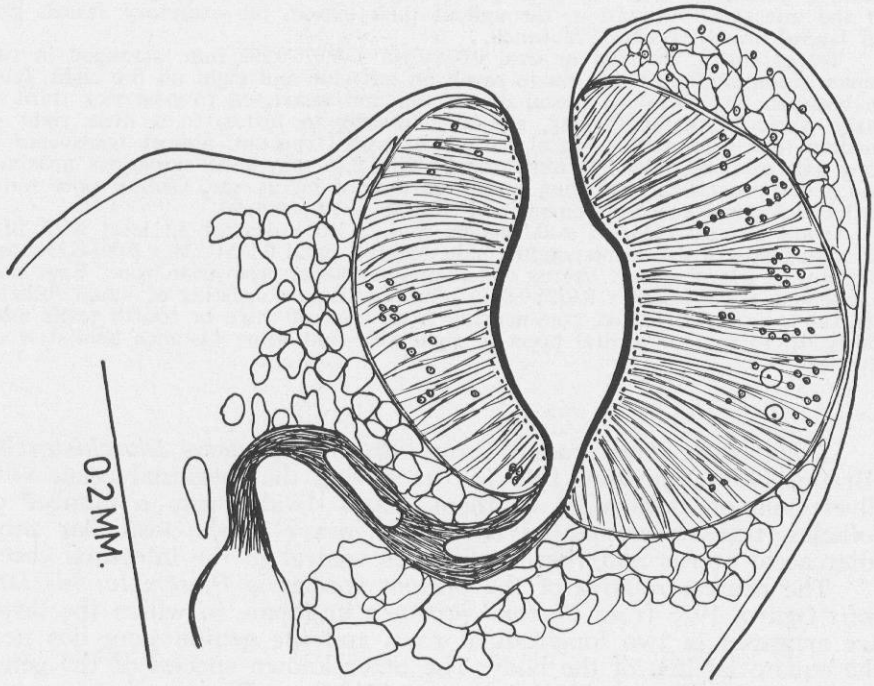
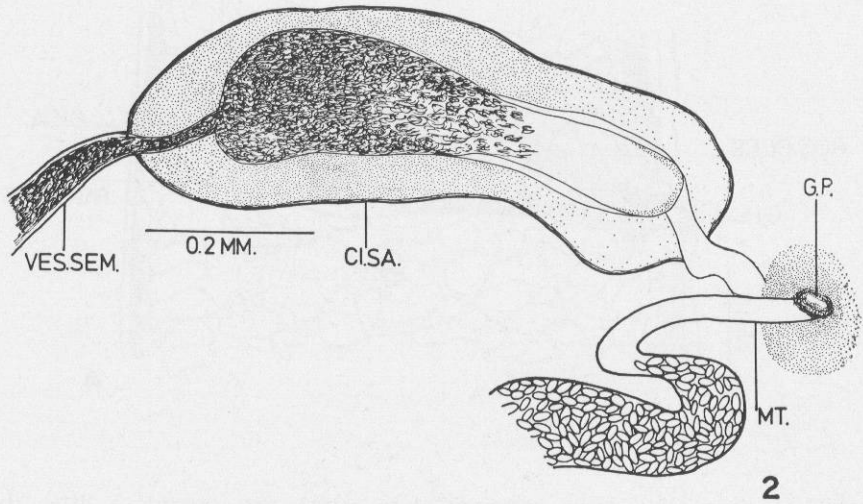
(Department of Zoology, Panjab University, Chandigarh, India)

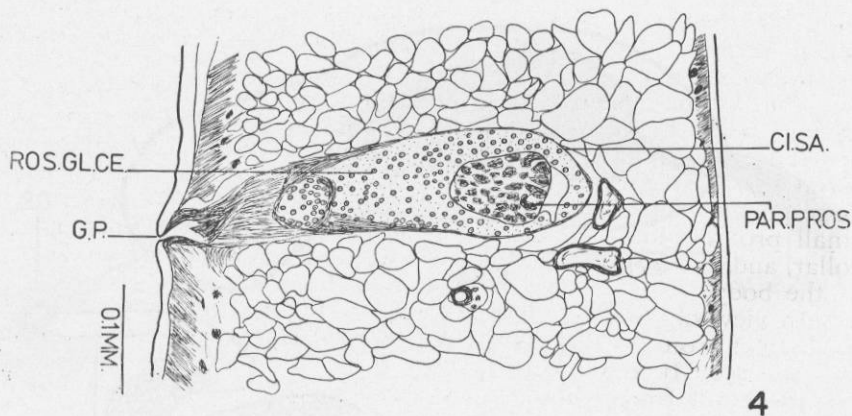
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Figs. 14 *Diaschistorchis mannarensis* n.sp. 1, a whole mount (ventral view); 2, a magnified portion of the same showing the terminal genital ducts; 3, oral sucker in sagittal section showing its musculature; 4, cirrus sac and genital pore in sagittal section.

C.I.S.A - cirrus sac; CO. - collar; EX.P. - excretory pore; G.P. - genital pore; INT.CA. - intestinal caeca; INT.DIV. - intestinal diverticula; M.G.L. - Mehlis' gland; MT. - metraterm; O.S. - oral sucker; OES. - oesophagus; OV. - ovary; PAR.PROS. - paraprostatica; PROS.GL.CE. - Prostate gland cells; T. - testes; UT. - uterus; VES. SEM - vesicula seminalis; VIT. - vitellaria.





middle is given off a main excretory vessel which first ascends a little, then takes a backward turn but soon proceeds anteriorly reaching up to the region of the intestinal bifurcation; throughout their extent, the excretory vessels give off lateral branches which rebranch.

Testes entire, rounded or oval 0.078-0.246 x 0.078-0.292 mm, arranged in two separate longitudinal rows, six to seven on left side and eight on the right, lying in between or ventral to caecal diverticula and restricted to posterior third of body. Vesicula seminalis long, sinuous, anterior to testes, to a little right of median line. Cirrus sac ventral to left intestinal caecum, almost transverse to long axis of body, 0.39-0.741 mm long by 0.165-0.25 mm wide across its proximal end; pars prostatica occupying major portion of cirrus sac. Genital pore outer to left intestinal caecum, ventral and slightly pre-equatorial.

Ovary lobate, 0.156-0.35 x 0.156-0.204 mm, a little dextral, in level with fifth or sixth testis of the corresponding side. Mehlis' gland 0.175-0.234 x 0.097-0.234 mm, median, to left of ovary. Uterus coiled in intercaecal preovarian zone. Eggs non-filamented, 0.0256-0.0283 x 0.0121-0.0135 mm. Vitellaria consisting of small follicles ventral to intestinal caeca, commencing from level of third or fourth testis anteriorly up to that of genital pore on right side and some distance behind it on the left.

DISCUSSION: The present form falls in the genus *Diaschistorchis* (Braun, 1901) Johnston, 1913 for its having the intestinal caeca with diverticula on both sides of them, testes divided into a number of follicles, transversely placed cirrus sac, ovary in the testicular zone, intercaecal uterus and vitelline follicles ventral to the intestinal caeca.

The nearest relative of the present species is *Diaschistorchis lateralis* Oguro, 1936 from *Chelone japonica* in Japan, in which the testes are arranged in two longitudinal rows and the genital pore lies near the equatorial line of the body. The other known species of the genus are *D. pandus* (Braun, 1901) Johnston, 1913 from *Thalassochelys caretta* in Italy, *Chelone mydas* and *C. imbricata* in the West Indies, the Mediterranean, Australia, *Caretta caretta* in the Gulf of Mexico, *Eretmochelys squamosa* in Japan and *E. imbricata* in India; *D. gastricus* Mehra, 1932 from *Kachuga dhongoka*, *K. smithi*, *K. tectum* and *Hardella thurgi* in

India; *D. takahashii* Fukui and Ogata, 1936 from *Ocadia sinensis* in Japan; and *D. multitesticularis* Rohde, 1962 from *Hieremys annandeli* in Malaya.

The last-mentioned four species stand apart from the present form by having the testes arranged in a manner so as to form a 'U' in the posterior part of the body, and the genital pore far in front of equatorial line. *D. lateralis* also stands apart from it in having relatively large gonads, testes with irregular margins and seven in each row, and small protuberances on each side of the oral sucker representing the collar, and in the absence of the conical projections at the rear extremity of the body.

In view of the preceding differences, the present form is regarded as distinct from all the known forms of the genus and representing a new species. It has been named *Diaschistorchis mannaensis* n. sp. after the gulf from where its host specimens were procured.

Differential diagnosis: Posterior extremity of body provided with a pair of conical projections. Collar apparently absent. Testes entire, rounded, arranged in two separate longitudinal rows, 6-7 on left side and 8 on the right, relatively small. Genital pore slightly pre-equatorial.

Specific diagnosis: Body blood red in live flukes, somewhat elliptical, concave ventrally, posterior extremity with a pair of conical projections, 7.315-10.384 mm long by 2.695-3.41 mm broad. Collar inconspicuous. Oral sucker subterminal. Oesophagus short. Intestinal caeca with diverticula on their outer and inner sides, reaching up to posterior end of body. Excretory vesicle small, giving off two main vessels, which branch and rebranch and reach up to caecal bifurcation; pore dorsal. Testes in two separate longitudinal rows, 6-7 on left side and 8 on the right, entire rounded or oval. Vesicula seminalis to right of median line, sinuous. Cirrus sac somewhat transversely placed, ventral to left intestinal caecum. Genital pore ventral, outer to left intestinal caecum, slightly pre-equatorial. Ovary lobate, dextral, in level with fifth or sixth testis. Mehlis' gland median. Uterus intercaecal. Eggs non-filamented. Vitellaria from level of third or fourth testis anteriorly up to that of genital pore on right side and some distance behind it on the left.

Host: *Chelone mydas* (Linn.)

Location: Intestine

Locality: Gulf of Mannar (Pamban, Tamil Nadu)

In order to accommodate the new species in the genus and also in view of the specific characters of *D. lateralis* Oguro, 1936, the diagnostic features of *Diaschistorchis*, as given by Yamaguti (1958, 1971), have been emended.

Generic diagnosis (emended). - Pronocephalidae, Diaschistorchiinae: Body elliptical or more elongate. Collar less conspicuous than in other genera, in form of low swelling round the head, or inconspicuous. Oral sucker usually well developed. Oesophagus short, may be provided with posterior bulb. Intestinal caeca with numerous outer and inner outgrowths in different degrees of development. Excretory vesicle Y-shaped, giving off branches, some of which may anastomose. Testes divided into a number of lobules which are arranged in a U-shape in the posterior part of the body or in two separate longitudinal rows ventral to intestinal caeca. Vesicula seminalis more or less winding. Cirrus sac claviform, oblique or transverse, enclosing terminal portion of vesicula seminalis, well-developed prostatic complex and cirrus. Genital pore lateral, ventral or medial to right or left caecum at varying levels posterior to caecal bifurcation. Ovary submedian, in testicular zone or at its anterior end. No receptaculum seminis. Uterine coils intercaecal between ovary and metraterm, latter shorter than cirrus sac. Eggs

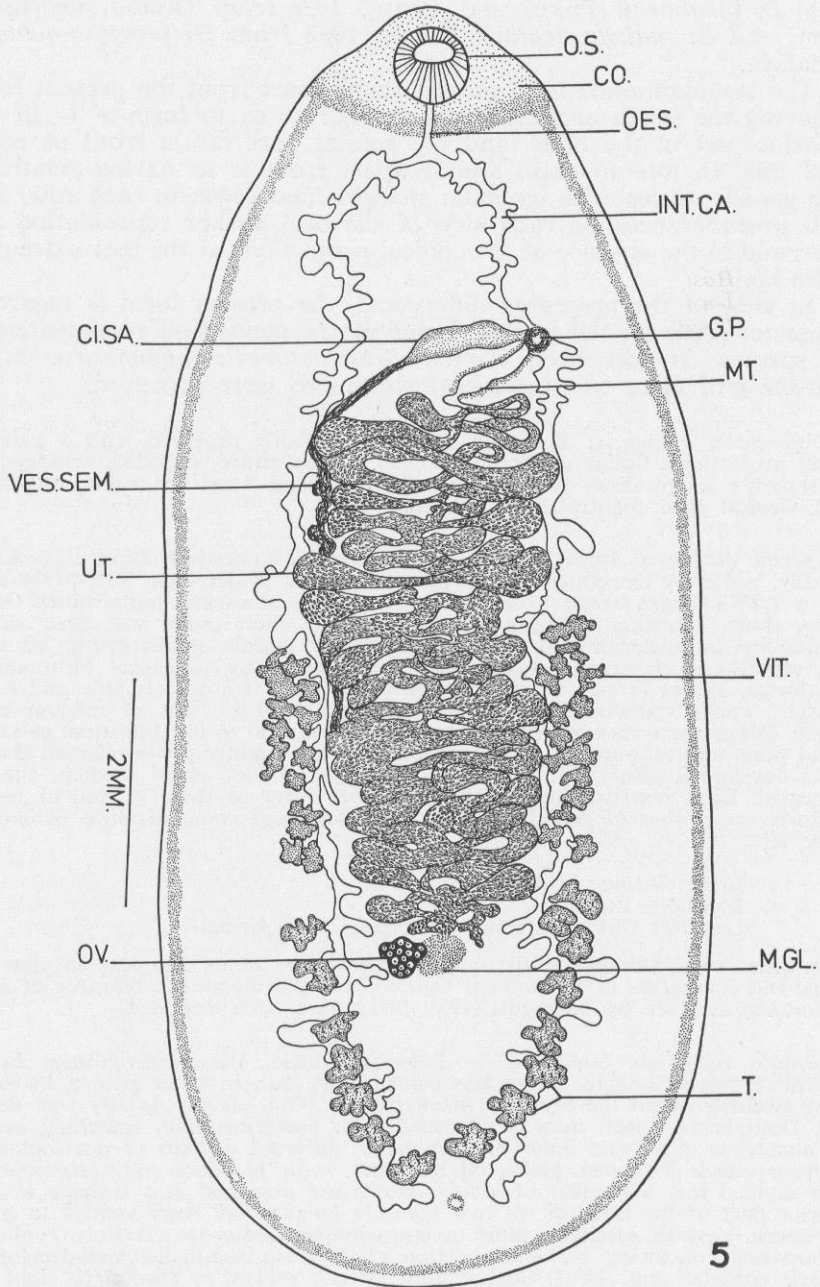


Fig. 5 *Diaschistorchis pandus* (Braun, 1901) Johnston, 1913 (whole mount, ventral view).

with or without polar filaments. Vitellaria of irregularly shaped acini, chiefly anterior to testes, ventral to intestinal caeca, though they may extend backwards into testicular fields with their anterior end at different levels in different species. Parasitic in digestive tract of marine and freshwater chelonians.

Diaschistorchis pandus (Braun, 1901) Johnston, 1913
 Syn. *Synechorchis megas* Barker, 1922
Wilderia elliptica Pratt, 1914
Diaschistorchis elliptica (Pratt, 1914) Price, 1931
 (Fig. 5)

Host: *Eretmochelys imbricata* (Linn.)
Location: Intestine
Locality: Gulf of Mannar (Pamban, Tamil Nadu)

REMARKS: This is the second record of the occurrence of *Diaschistorchis pandus* (Braun, 1901) Johnston, 1913 from *Eretmochelys imbricata* in this country. Earlier, Simha, Rao and Chattopadhyaya (1971) had reported this species from the same host in the Indian Subcontinent without mentioning any specific locality. The writers collected twelve specimens of this form.

Key to the species of the genus *Diaschistorchis* Johnston, 1913
 (emended)*

1. Testes arranged in two longitudinal rows, not meeting mesially in the region behind ovary. Genital pore nearly equatorial 2
 Testes meeting mesially in the region behind ovary, forming U-shaped pattern. Genital pore far in front of equatorial line 3
2. Testes with irregular margins and relatively large, 7 in each row. Posterior end of body not provided with conical projections *D. lateralis* Oguro, 1936
 Testes entire, rounded and relatively small, 6-7 in left row and 8 in the right. Posterior end of body provided with a pair of conical projections *D. mannarensis* n. sp.
3. Vitellaria commencing at level of genital pore 4
 Vitellaria commencing at a level a little behind genital pore *D. takahashii* Fukui and Ogata, 1936
 Vitellaria commencing far behind genital pore *D. pandus* (Braun, 1901) Johnston, 1913
4. Testes 16-18 in all, mostly lobed *D. gastricus* Mehra, 1932
 Testes 25-31 in all, mostly with entire margins *D. multitesticularis* Rohde, 1962

* Skrjabin's (1955) key has been emended in order to include in it the new species and *D. multitesticularis*.

REFERENCES

- BRAUN, M. (1901): Trematoden der chelonier. Mitt. ausden Zoology Museum in Berlin. 2.
- BARKER, F. D. (1922): The parasitic worms of the animals of Bermuda I. Trematoda. Proc. Amer. Acad. Sci. 57, 213-237.
- FUKUI, T. and OGATA, T. (1936): On a new trematode from "Shinagame", *Ocacia sinensis*. Syokubutu oyobi Dabustu. 4 (10) 1707-1710.
- FUKUI, T. and OGATA, T. (1939): On three species of trematodes from *Ocacia sinensis* (Gray). Vol. Jubil. Yoshida Osaka. 2, 187-202.
- JOHNSTON, S. J. (1913): On some Queensland trematodes, with anatomical observations and descriptions of new species and genera. Quart. J. Micr. sci. 59 (3) 361-400.
- LOOSS, A. (1902): Über new and bekannte Trematoden aus Schildkroten, nebst Erörterungen Zur Systematik und Nomenclatur. Zool Jahrb. Syst. 16 (3-6) 411-894.
- MEHRA, H. R. (1932): Nouveaux monostomes de la famille des Pronocephalidae des tortugas d'leu douce de l'Inde. Classifiiation de cette famille. Ann. Parasit. 10 (3-4) 255-257, 323-329.
- OGURO, Y. (1936): Einige new und bekannte Pronocephaliden aus japanischen seeschildkroten. J Sc. Hiros. Univ. 5 (1) 1-28.
- PRATT, H. S. (1914): Trematodes of the logger head turtle (*Caretta caretta*) of the gulf of Mexico. Arch. Parasit. 16 (3) 411-427.
- PRICE, E. W. (1931): Redescription of two species of trematode worms from the MacCallum collection, with a note on the family Pronocephalidae. Proc. U.S. Nat. Mus. 18 (22) 1-20.
- ROHDE, K. (1926): A new trematode, *Diaschistorchis multitesticularis* from a Malayan tortoise, *Hieremys annadalei* (Boulenger). J. Parasit. 48 (2) 296-297.
- SIMHA, S. S., RAO C. R. and Chatopadhyaya, D. R. (1971): Studies on the trematode parasites of marine turtles. Proc. 58th Ind. Sc. Cong. IV, 22.
- SKRJABIN, K. I. (1955): Trematodvi zivotnviikh i Cheloveka. Qsnovi trematodologii Isdatyelystvo Akadyemii Nauk, SSSR, Moscow-Leningrad. 10.
- YAMAGUTI, S. (1958): Systema Helminthum, I. The digenetic trematodes of vertebrates. Interscience Publishers, Inc. New York, London.
- YAMAGUTI, S. (1958): Synopsis of digenetic trematodes of vertebrates. Vol. I, II. Keigaku Publishing Co., Japan.