

OBSERVATIONS ON DIGENETIC TREMATODES FROM THE
AIR BLADDER OF CATFISHES*

K. HANUMANTHA RAO

Department of Zoology, Andhra University, Waltair, India

ABSTRACT

Isoparorchiid trematodes are generally encountered in the air bladder of catfishes. The genus *Isoparorchis* Southwell, 1931 is from the air bladder of various freshwater catfishes of India, China, Java and Australia. *Elongoparorchis pneumatis* Hanumantha Rao is described from the air bladder of *Arius* spp. from Bay of Bengal. However, the genus *Pelorohelminis* Fischthal and Kuntz is described from the intestine of the leiognathid *Gazza minuta* (Bloch) from Palawan. More recently the genus *Dollfustravossosius* Freitas and Kohn has been erected for an isoparorchiid collected from the catfish *Tachysurus grandicassis* (Val.) from Brazil. The ecology and some anatomical peculiarities of these trematodes seem to be of more than passing interest. The synonymy of some of them seems evident. It would appear that *Dollfustravossosius* is identical to *Elongoparorchis* in all respects.

INTRODUCTION

THE isoparorchiid trematodes are typically parasitic in the air bladder of fishes. Chauhan (1955) gave a detailed account of the history and geography of the group. At that time the only well known genus was *Isoparorchis* reported from the air bladder of various catfishes from India, China, Java, Japan and Australia. In 1961 Hanumantha Rao described a new isoparorchiid (Fig. 1) *Elongoparorchis pneumatis* from the air bladder of the marine catfish *Arius jella* Val. of Waltair Coast. The genus *Elongoparorchis* is chiefly characterised by 1. long arcuate testes, 2. branched ovary with lobulated arms and 3. two groups of lateral postovarian vitellaria each with three or four lobulated more or less radiating arms. Fischthal and Kuntz (1964) described an interesting genus *Pelorohelminis palawanensis* from the intestine of *Gazza minuta* Bloch (Leiognathidae). The genus *Pelorohelminis* superficially resembles *Elongoparorchis* but differs from it in having a spherical ovary. But the vitellaria are thick, lobulated and the arms radiating. The isoparorchiid affinities of *Pelorohelminis* are easy to see but it comes from the intestine of leiognathid fish. A new sub family has been proposed and defined by Fischthal and Kuntz. *Tetraster siamensis* described by Oshmarin (1965) from the air bladder of *Arius* sp. from South China Sea appears identical to *E. pneumatis* although it was compared to *Cylindrorchis tenuicutis* Southwell, 1913.

More recently Teixeira de Freitas and Kohn (1967) described *Dollfustravossosius moniliovatus* from the air bladder of the catfish *Tachysurus grandicassis* (Val.) from Brazil. Fischthal and Thomas (1968) described *Pelorohelminis ghanensis* from the air bladder of *Arius latisculatus* of Tema, Ghana. These authors declared that *Dollfustravossosius* is synonymous to *Pelorohelminis* and a new family namely

*Presented at the 'Symposium on Indian Ocean and Adjacent Seas-Their Origin, Science and Resources' held by the Marine Biological Association of India at Cochin from January 12 to 18, 1971.

Peloroelminthidae has been proposed. It would appear that the genus *Dollfustravassosius* may fall into synonymy with *Elongoparorchis*. The two are indistinguishable despite certain apparent differences. For instance the ovary in *Dollfustravassosius* has been reported to be ovoid. Teixeira de Freitas and Kohn have figured the posterior end of the worm showing the character and disposition of female reproductive organs. From their figure it is possible to speculate that what has been represented (in the anterior region) as a part of vitellaria is actually the ovary with club-shaped lobulated arms (similar to the condition in *Elongoparorchis*). The big ovoid structure they have considered as ovary may be Mehlis' gland which appears so conspicuous in *Elongoparorchis*. Pritchard (personal communication) has collected a trematode from the air bladder of *Bagre* sp. in Callao Bay, Peru which she stated is in many respects similar to *E. pneumatis*. Bakkala (1970) mentioned that *Isoparorchis* has been reported from the chum salmon *Oncorhynchus keta* (Walbaum).



Fig. 1. Microphotograph of *Elongoparorchis pneumatis* showing branched ovary (ov) and vitellaria (vt).

These observations raise a basic question. What is the present position of this very interesting family Isoparorchidae and the status of all the genera supposedly belonging to it?

Firstly the family Isoparorchidae no doubt remains strengthened. *Isoparorchis* forms the type genus. It would appear appropriate to relegate the genus *Elongoparorchis* to this family. The isoparorchid characters of *Peloroelmins* are very great indeed. There does not appear to be sufficient justification in the erection of the family Peloroelminthidae.

The new subfamily *Dollfustravassosinae* erected by Teixeira de Freitas and Kohn becomes redundant. Moreover, Manter and Pritchard (1960) who reviewed the superfamily Hemiuroidea to which *Isoparorchidae* belongs cautioned "supra-generic groups many with a single genus do not seem justified to us at the present time".

The apparent similarity in the structure of ovary (OV) vitellaria (VT) is characteristic and most confusing in the genus *Elongoparorchis*. In specimens treated with Fast red salt B or catechol the vitellaria could be selectively stained, delineated and observed. In these preparations the anterior branched ovary remains completely unstained. In alum carmine preparations careful examination reveals that the ovary appears pinkish but the vitellaria are reddish brown. In sections the different histological nature of these organs can of course any way be made out even by a cursory inspection.

Therefore there does not seem to be sufficient justification in upholding the validity of the genus *Dollfustravassosius* which may be nothing else than *Elongoparorchis*. Even if it is taken for granted that the ovary is ovoidal (which is unlikely) yet it may be synonymous to *Elongoparorchis* but demanding the erection of a separate species.

TREMATODES OF CATFISHES OF INDIA

It is apparent that the trematodes of catfishes of India are of more than passing interest from the structural as well as zoogeographical and host-parasite-tissue specificity angles. Manter (1966) has adduced evidence that host specificity among Digenea of tropical marine fishes is a spectacular phenomenon. To mention one example the digenetic parasites of *Kyphosus* a warm water fish at the Great Barrier reef and in the Caribbean are very similar. Three of the four species appear to be identical in the two localities. But species of parasites of *Kyphosus* from the north of Australia are largely different from *Kyphosus* in the comparatively nearer cold south of Australia. It can be seen that isoparorchids are trematodes chiefly living in the air bladder of tropical catfish. Manter (1967) stated that catfishes are relatively primitive tropical teleosts and show strong marine influences but no parasitologist in India has as yet clearly separated infections of second division fishes from those of strictly fresh water fishes. However, it goes without saying that exceptions are always there. Here *Peloroelms palawanensis* is an exception. Not only it occurs in a leiognathid fish but in its intestine. However, *P. ghanensis* is again from the air bladder of catfish. The chief food of *Elongoparorchis* and *Isoparorchis* is blood drawn from the air bladder capillaries. Hematin the dark brown pigment which is the degradation product of blood could be seen accumulating in the caeca of both *Elongoparorchis* and *Isoparorchis*.

In the light of these observations the *Isoparorchidae* Roche, 1925 may be emended as follows.

Medium to large distomes. Oral sucker acetabulum and pharynx well developed. Caeca long, serpentine. Testes postacetabular spherical to elongated, symmetrically placed. With hermaphroditic duct into which ejaculatory duct and metraterm open. Genital pore at the level of pharynx. Female reproductive organs in the posterior region. Ovary spherical or tubular or branched. Vitellaria branched dendritic or lobulated radiating arms. Uterus winding, preovarian. Excretory bladder Y-shaped. Parasites of fishes in air bladder and intestine.

REFERENCES

- BAKRALA R. G. 1970. Synopsis of biological data on chum salmon *Oncorhynchus keta* (Walbaum, 1792). U. S. Dept. Interior, U. S. Fish and Wild life service, Bureau of Commercial Fishes circular 315 : 1-89.
- CHAUHAN, B. S. 1955. On the taxonomic position and distribution of the trematode genus *Isoparorchis* Southwell, 1913. *J. Zool. Soc. India*, 7 : 177-181.
- FISCHTHAL, J. H. AND R. E. KUNTZ 1964. Digenetic trematodes from Palawan Island, Philippines. Some immature Didymozoidae, a bucephalid, a new hemiuroid genus and subfamily. *J. Parasit.*, 50 : 252-260.
- HANUMANTHA RAO, K. 1961. *Elongoparorchis pneumatis* gen. et sp. nov. (Trematoda) from the air bladder of the marine cat fish *Arius jella* (Val.). *J. Helminth.*, 35 : 301-304.
- MANTER, H. W. 1966. Host parasite relationships. Proc. 26th Annual Biol. Colloquium, Oregon State University Press, 1965 : 59-71.
- 1967. Some aspects of the geographical distribution of parasites. *J. Parasit.*, 53 : 1-9.
- AND M. H. PRITCHARD 1960. Some hemiurid trematodes from Hawaiian fishes. *Proc. Helm. Soc. Wash.*, 27 : 87-102.
- OSHMARIN, P. G. 1965. Two new subfamilies of trematodes in the South China Sea. *Helminthologia*, 6 : 99-107.
- TEIXEIRA DE FREITAS, J. F. AND A. KOHN 1967. *Dollfustravassosius moniliovatus* gen. et. sp. nov. (Trematoda: Isoparorchidae) un trematode parasite de poisson marin. *Ann. Parasit.*, 42 : 313-317.