SHORT COMMUNICATION

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ON ABNORMAL DEVELOPMENT OF MALE GENITALIA IN DIGENETIC TREMATODES*

Teratology and aberrations are of infrequent occurrence in animal kingdom reasons of which are varied and manifold being genitical, physiological or otherwise. In the course of routine examination of helminth parasites we have observed structural and morphological anomalies in some population as a whole or in a particular specimen out of the lot. A survey of the literature also reveals that several records of abnormalities in helminth parasites do exist. These abnormalities have been interpreted variously by different authors, at times resulting in new taxa. In an earlier communication (Ghosh and Srivastava, 1976) we discussed the abnormal development of vitellaria. This paper presents the abnormalities observed in male genital complex of digenetic trematodes and discusses their taxonomic importance.

Barker and Parsons (1917) observed that male and female reproductive organs in *Aorchis extensus* Barker and Parsons, 1917 develops normally in young (smaller) forms but disappear in older (larger) worms. Ruszkowski (1925) reported a specimen of *Isthmiophora melis* (Schrank, 1788) Luhe, 1909 having single testis with slight rudiments of posterior testis. He further recorded a specimen of *Echinostoma revolutum* (Froelich, 1802) Looss, 1899 with degenerated anterior and normal posterior testis. Bhalerao (1926) recorded single testis along with some other abnormalities in a population of about a dozen worms of *Echinochasmus corvus* Bhalerao, 1926. Manter (1930) reported single testis along with other abnormalities in *Helicometra torta* Linton, 1910 due to early injury in the worm. Stunkard and Nigrelli (1930) noted the presence of single testis instead of normal two in *Lintonium vivax* (Linton, 1900). Ciurea (1933) recorded complete disappearance of left testis in a specimen and also noted complete disappearance of both testes in another specimen of *Metagonimus yokogawai* (Katsurada, 1912) Katsurada, 1913. Chen and Wang (1933) recorded several cases of various abnormalities in genital organs in *Clonorchis sinensis* (Cobbold, 1875) Loose, 1907. In his opinion some abnormalities in respect of male genital organs might be due to presence of eggs in so many places. They had also observed presence of egg into the testes and after discussing several probable reasons thought that all the theories proposed are "entirely speculative and the question is still open to other suggestions." Ameel (1938) reported the transitory nature of single testis in *Euryhelmis monorchis* Ameel, 1938. Odlaug (1939) observed abnormal condition of testes, vitellaria and uterus in *Gorgodera amplicava* Loose, 1899. He concluded that degeneration and disintegration of testes and vitellaria are, "..intrinsic in the reproductive system of trematodes themselves, although it is entirely possible that certain changes in the physiology or habitat of the host such as a condition of starvation might

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induce atrophy of the genital organs in parasites. Degeneration is cyclic phenomenon with alternate atrophy and reconstitution of reproductive organs. Infrequent occurrence of the degenerate condition make this explanation seem improbable." Mehra (1947) recorded complete disappearence of testes and ovary in some specimens of *Gogatea birmanicus* (Chatterji, 1940) (=*Mesosteph anoides birmanicus*) (Chatterji, 1940) Dubois, 1951) and concluded that the gonads disappear in this trematode soon after sexual maturity. Malviya (1966) reported a specimen of *Echinochasmus* perfoliatus Tubangui, 1922 with a single testis.

We observed the presence of single testis in a specimen out of a large population of

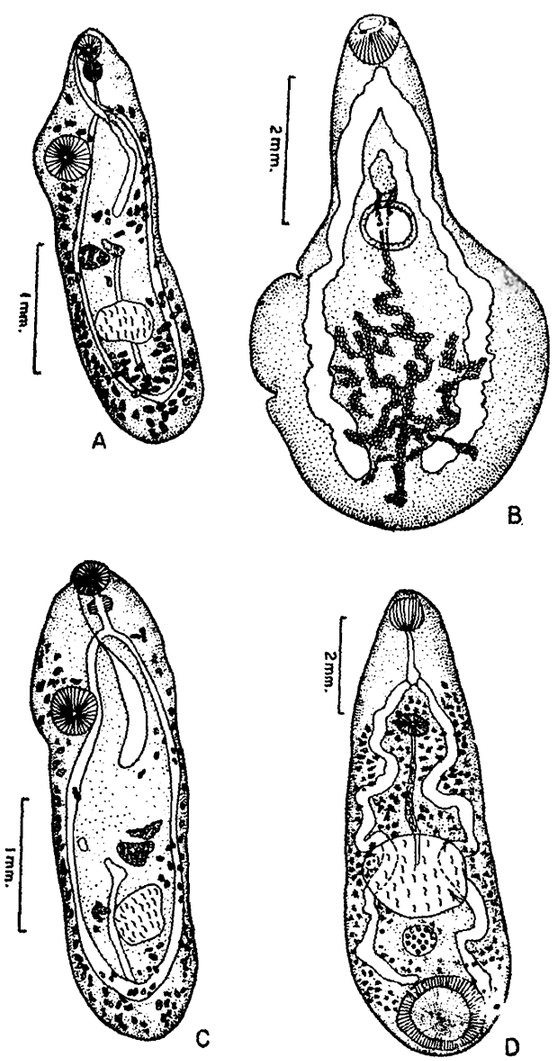

Fig. 1. Digenetic trematodes showing abnormal development in male genitalia : *A—Opegaster jamunicus* Srivastava, 1968, having single testis ; B—*Phyllodistomum chauhani* Motwani and Srivastava 1961, showing absence of all the gonads and vitellaria ; C—*Nicolla allahabadensis* (Srivastava, 1968), having a single testis. D—*Cotylophoron indicum* Stiles and Goldberger, 1910, showing the development of single testis.

Cotylophoron indicum Stiles and Goldberger, 1910 (Fig. 1D). In another paramphistomid, *Ceylonocotyle* sp. presence of single testis was noted. The specimens were otherwise normal without any gross structural deformity. Another specimen in a lot of *Opegaster jamunicus* Srivastava, 1968 (Fig. 1 A) showed the presence of a single testis. The specimen was having normal development of all other organs. Possession of a single testis was also observed in a specimen of *Nicolla allahabadensis* (Srivastava, 1968), (Fig. 1 C).

A single specimen in a population of *Phyllodistomum chauhani* Motwani and Srivastava, 1961 (Fig. 1 B) was found to be peculiarly abnormal is not possessing any of the gonads including vitelline glands. The uterus in this specimen was full of eggs. Cirrus sac was found to be massive but in other respects the specimen appeared to be normal. It may be inferred that the gonads have disintegrated after discharging their function as observed by Mehra (1941) in *Gogatea birmanicus* (=*Mesostephanoides birmanicus*). But this contention does not find support as we have observed in another specimen of the same lot where one testis and one compact vitelline gland were absent. Secondly in majority of the adult specimens all the gonads were present. As such in this particular case there is some additional factor responsible for the type of apparent abnormalities.

We are very much aware that at the present stage of our knowledge the reason for these abnormalities are obscure. Yet it can be said that this may be three fold *i. e.* (1) genetic, (2) due to hyperparasitism, (3) early injury at some developmental stage.

We very much agree with the comments of Dawes (1946 p. 63) regarding abnormalities and artefacts that "No doubt such abnormalities are more common than a perusal of the literature would have us to believe, and they should be recorded."

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Zoological Survey of India, Calcutta

R. K. GHOSH
AND
C. B. SRIVASTAVA