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## OCCURRENCE OF TRIPLOIDY AND PARTHENOGENESIS IN THE ALLOCREADIID TREMATODE, *ALLOCREADIUM FASCIATUSI* KAKAJI 1969

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IN the life cycle of digenetic trematodes, the egg producing adult generation lives in the vertebrates and the larval generation occurs in the tissues of molluscan intermediate host. The adult usually reproduces by amphimixis which involves fusion of gametes formed by the meiotic activity of germ cells. The larval stages within the intermediate host on the other hand reproduce by asexual methods. In recent years, evidence has been presented to show that at least some adult digenetic trematodes reproduce by parthenogenesis which is coupled with the occurrence of triploidy[1-3]. Such instances are, however, rare.

In the course of our studies on cytogenetics of digenetic trematodes, it has been found that the allocreadiid trematode *Allocreadium fasciatusi* Kakaji 1969 which occurs in the intestine of the freshwater fish *Aplocheilus melastigma* McClelland in a stream at Waltair reproduces by parthenogenesis. Examination of sections of this fluke stained with haematoxylin and of smears and squashes of testes and eggs stained with acetoorcein and Feulgen methods[4] revealed that the mitotic figures unequivocally contain 21 chromosomes which could be arranged into 3 sets of 7 basic chromosomes indicating the triploid nature of the configuration (figure 1). No spermatozoa were found inside seminal vesicle or seminal receptacle or testes. Normal development of germ cells inside testes proceeded up to the formation of primary spermatocytes. Inside the primary spermatocytes there was no meiotic activity, the chromosomes were asynaptic and

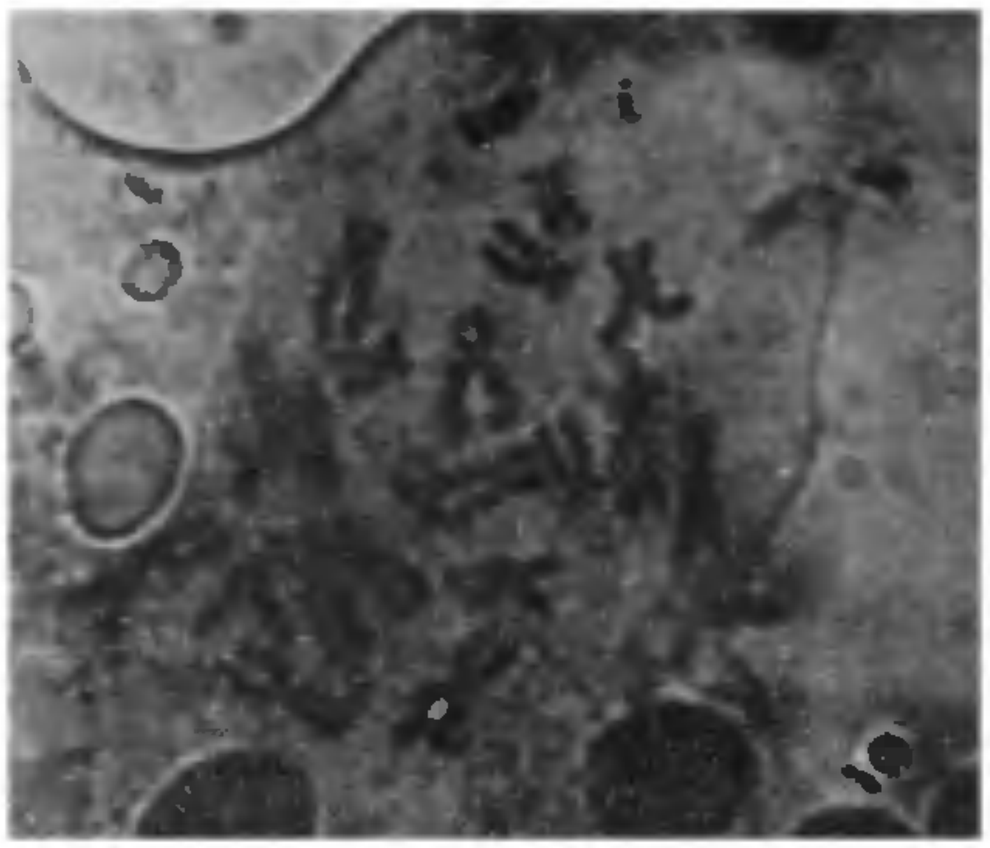

**Figure 1.** Mitotic metaphase plate of *A. faciatusi.*, showing 21 chromosomes.

appeared as mitotic univalents. Only a few primary spermatocytes successfully completed the division and developed into secondary spermatocytes. Further, very few spermatids, if at all, were found in testes smears and spermateleosis was a failure. In the oocytes enclosed inside the eggs, the development of oocyte proceeded without the intervention of a spermatozoon. There was only one maturation division in the primary oocyte which is of mitotic type and resulted in the release of a single polar body. Cleavage followed this division. All the evidence points to the fact that *A. fasciatusi* is a triploid species and reproduces by apomictic parthenogenesis.

Among digenetic trematodes, parthenogenesis coupled with triploidy has previously been reported in *Bunodera sacculata* van Cleave and Muller, 1934, *Paragonimus pulmonalis* (Baelz 1880) and *Fasciola* sp.[1-3] Occurrence of polyploidy and parthenogensis has also been noted in the caryophyllidean cestodes *Atractolytocestus huronensis* Anthony 1958 and *Gladacris catostomi* Cooper, 1920[5,6] and in the pseudophyllidean cestode *Diphyllobothrium erinacei* Faust, Campbell and Kellogg 1929[7]. Many other worms still remain to be explored for the possible occurrence of polyploidy and parthenogenesis. It seems reasonable to infer that polyploidy has played an important role in the evolution of hermaphroditic flatworms. In the light of this, the views of earlier authors[8-10] that there is no evidence of polyploidy within the group Digenea and that variations in chromosome numbers have occurred due to gradual addition or loss of chromosomes need to be modified.

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## OCCURRENCE OF VENTRAL PROSTATE IN THE FEMALE GERBIL, *TATERA INDICA* CUVEIRII (WATERHOUSE)

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ALTHOUGH the occurrence of ventral prostate gland is not uncommon in rodents[1], the presence of the glands in the Indian gerbil, *Tatera indica* Cuveirii has not been reported so far. The occurrence in the females is sporadic and its incidence is about 40 to 50%. Occasional occurrence of the glands has also been reported in the African field rat, *Arvicanthis cinereus*[2]; *Rattus norvegicus*[2]; African mice, *Mastomys erythroleucus*[4]; field mouse, *Apodemus sylvaemus sylvaticus*[5]; field voles, *Microtus arvalis*[6]; and African tree rat, *Graminomys surdaster*[7].

The prostate glands in the female gerbil lie on the ventral side of the neck of the urinary bladder (figure 1). They are tubulo-alveolar in nature having paired lobes which extend on either side of the urethra and a single duct from each lobe opens into the urethra. In pregnant and lactating females, it often shows striking development. However, in the non-pregnant animals the glands are small and regressed. The glands enlarge during pregnancy and show secretory epithelium. The cavities of the glands are filled with secretions. This condition is maintained throughout pregnancy and lactation. A biochemical analysis of the glands indicates the presence of citric acid in the secretion. Further, when androgen is administered, the glands are stimulated and exhibit a high epithelium and the secretion of citric acid is enhanced. In the rat[8], androgen is produced during pregnancy and lactation. Accordingly, the striking development of ventral prostate in pregnant and lactating gerbils can be explained when it appears stimulated by the endogeneous androgen of ovarian origin[9].


**Figure 1.** Female reproductive system of the gerbil, *Tatera indica*. Cuveirii with an accessory ventral prostate gland indicated by an arrow. Inset, ventral prostate gland enlarged. O, ovary; Ov, oviduct; Ut, uterus; b, urinary bladder; Vg, vagina.

Thus, the female prostate gland of gerbil appears to be homologous with the ventral lobes of the male prostate glands. In addition, it is functionally equivalent to the male ventral prostate in the secretion of citric acid.

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