THE TUBULAR DIFFERENCES IN MOUSE TESTIS

While observing a large number of cross-sections of the normal testes, the author encountered the difference in the evolving population of germ cells and the diameter between peripheral and central tubules. Such tubular differences have not been reported so far.

The observations were made on the testes of adult Swiss albino mice 6–8 weeks old, and 23 ± 3 g weight. The testes were fixed in Bouin's fluid, Carnoy's fixative and Zenker's formol. For the complete fixation, a slight incision was given on one side of the tissues. Serial sections, cut at 5 μm after paraffin embedding, were stained with PAS-haematoxylin or Harris haematoxylin-eosin. The counting of germ cells and measurement of diameter was carried out unbiasedly from the two different regions. The observations were repeatedly checked and confirmed. Almost circular tubules of the similar diameter were chosen for the end points.

Table I

End points	No. of animals	No of testes	Tubules examined/testes	Peripheral tubules	Central tubules
Germ cells/per tubule (Mean ± S.E.)	11	19	10	298 ± 6	282 ± 4 $P < 0 \cdot 05$
Tubular diameter (Mean ± S.E.) in μm	24	45	10	$202 \cdot 3 \pm 2 \cdot 1$	$192 \cdot 8 \pm 1 \cdot 9$ $P < 0 \cdot 001$

As revealed from Table I, the central tubules are smaller in diameter than the peripheral tubules. Moreover, they also have less number of germ cells per tubule than those of the peripherals. The earlier work on embryonic development indicates that the male sex-cords of the embryonic gonad evolve into the seminiferous tubules of the adult testes[1,2]. De Burlet and de Ruiter[3], working on embryonic mouse testes, and Roosen Runge[4] working on embryonic rat testes reported the appearance of the two types of C-shaped arches: an outer, which runs immediately below the tunica albuginea and the other, inner arches found in the central core of the testis. These workers, however, restricted their studies mostly on the early formation of the sex-cords. Clermont and Huckins[5] described the pattern of development of the cords into seminiferous tubules in the albino rats and reported the evolution of both outer (peripheral) and inner (central) tubules from outer and inner arches of the sex-cords, respectively. They also noticed that the inner tubules had a tendency to be slightly shorter than the outer ones. Hence no wonder if this difference in their developments accounted for the difference in their germ cell population and diameter noticed in the present study.

Further, it has also been marked that both the types of tubules show a different behaviour upon irradiation. The central tubular diameter gets rapidly affected by acute and continuous dose levels, in developing the adult mice testes, while the peripheral tubules show a gradual shrinkage depending on the dose levels (Fig. 1). It is difficult to determine the reason for the behaviour of the two types of tubules. It is possible that, it is brought about by some hormonal changes or by population alterations. However, the intertubular oedema and the sensitivity of some spermatogenic cells might be the factors for such behaviour after irradiation[6].

The present study indicates that the error due to this difference in the diameter, and the germ cell population, may account for the quantitative observations on testicular germ cells. The error can be eliminated by taking only one type of tubules, preferably outer one into accounts. This behaviour of the tubules however, needs further study.

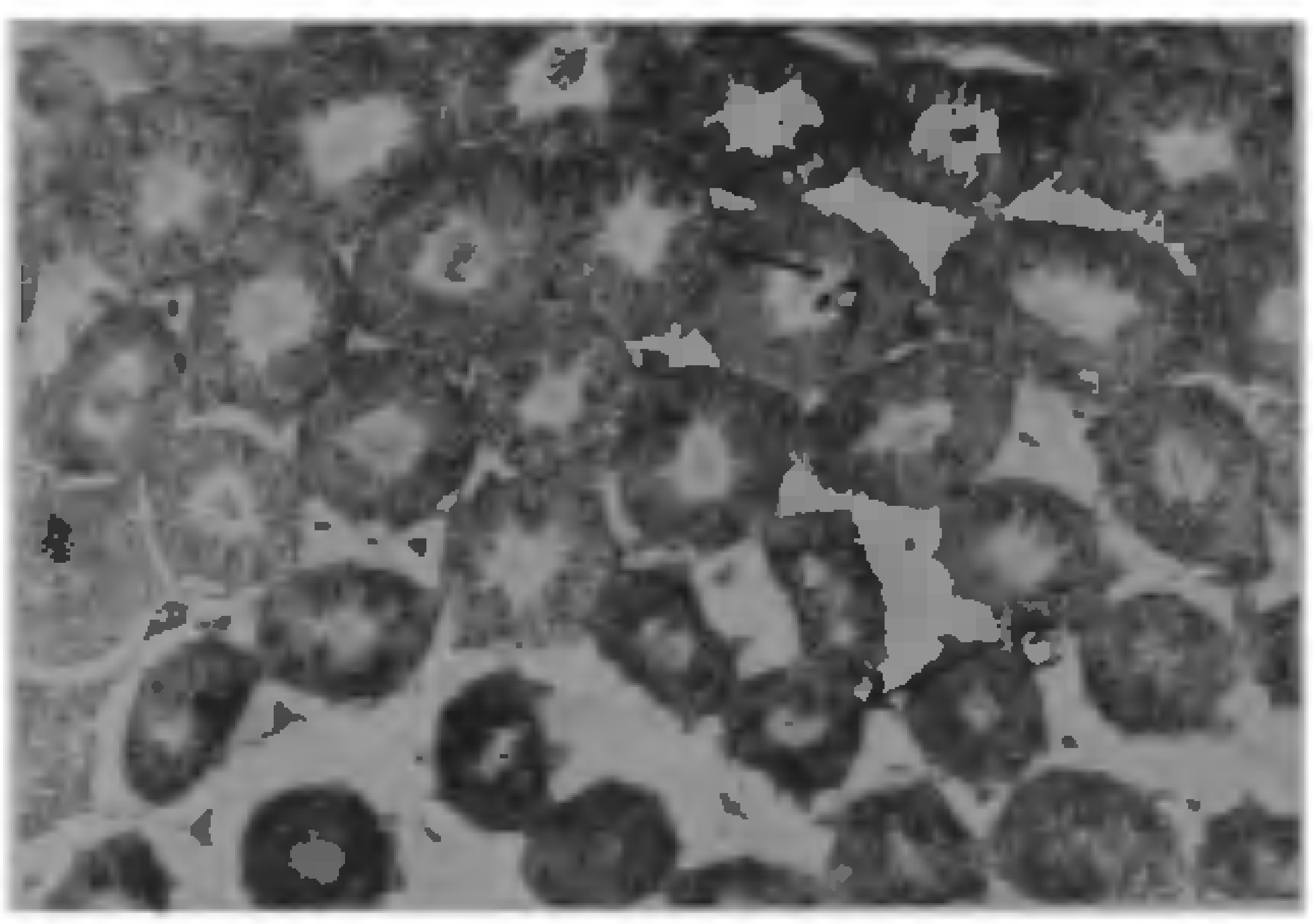

Fig. 1

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STUDIES ON PISCICIDAL PLANTS OF NORTH-EASTERN INDIA: HOPE FOR AN INDIGENOUS PLANT POISON FOR FISH NURSERY MANAGEMENT

IN modern fisheries plant products[1-2] like rotenone[3], jugulone[4], pyrethrin and pyrethroids[5] are used to remove predatory and weed fishes from rearing ponds. The toxic action of these plant products have been observed to be of short duration depending on the concentration of the toxin. In many cases, the fishes which have been poisoned can be revived back to normalcy by transferring them to fresh water. Chemical poisons are sometimes used in fishery management However, due to their acute toxicity on fishes, sustained residual toxicity and their side effects on other aquatic organisms, they are not much acceptable. Among the plant products, the most important one is rotenone which is obtained from Derris root (*Derris trifoliata* Lour.) and is at present imported to India. Hence, there is an urgent need to find out a suitable substitute for rotenone from indigenous piscicidal plants.

Chopra *et al.*[6] have described 112 plants in India reported to have piscicidal action. Out of these, more than 40 plants occur in N.E. India[7]. The authors have collected and identified 10 plants reported to have piscicidal effect from N.E. India (Table I). Toxicity studies were carried out on 5 of them on two species of fresh water fishes commonly found in hill streams, *Puntius shalynius* (Yazdani and Talukdar), *Danio dangila* (Hamilton) and on one species of brackish water air-breathing fish, *Heteropneustes fossilis* (Bloch.). The oxicity experiments were carried out in 10 l glass jars with a minimum of 10 fishes. The plant parts were first air-dried in shade and finely powdered. The results are provided in Table II. These results indicate that the fruits of *Zanthoxylum armatum* DC (=*Z. alatum* Roxb.) have more acute toxic effect among the different plants screened. *Zanthoxylum armatum* occurs commonly in the hilly tracts of N.E. India and the fruits are extensively used for catching fishes locally.

TABLE I

Details of piscicidal plants commonly used by the N.E. Indian tribals in fishing

Batanical name	Part/s used	Local name
Croton tiglium L.	seed and fruit	Jambola gota
Eupatorum odoratum L.	leaf and shoot	Assam-lota
Milletia pachycarpa Benth.	root	Bakoa-biri; Bokol-bih; Bishloti
Myrica esculenta Buch.-Ham.	bark	Soh-phi; Keifang; Naga-teng; Kaiphal
Polygonum hydropiper L. var. *flaccidum* Steward	whole plant	Pani maricha
Polygonum hydropiper L. var. *hydropiper*	whole plant	..
Potentia fulgens Wall *ex* Lehm.	root	..
Taxus baccata L.	leaf, shoot and seed	Dingsableh
Xeromphis spinosa (Thunb.) Keay (=*Randia dumetorum* Poir.)	fruit	Dieng-makasing-khlaw; Gurol, Behmona; Mainphal
Zanthoxylum armatum DC. (=*Z. alatum* Roxb.)	root, fruit, bark and leaf	Gaira, Tambul