THE SITES OF STEROID SYNTHESIS IN THE *TESTIS* OF HAWK, *ACCIPITER BADIUS* (GMELIN): A HISTOCHEMICAL STUDY

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THE recent advances in the morphology, histochemistry, and biochemistry of steroidogenic cellular sites in the testes of non-mammalian vertebrates have been reviewed[1–3,5]. It is apparent from these that histochemical studies on the steroidogenic tissue in the testis of wild birds are scanty. The present work was therefore undertaken to study histochemically the steroid synthesizing cellular sites in the testis of hawk, *Accipiter badius* which is a wild bird of prey showing seasonal reproductive cycle[4]. This bird is known to breed during March–June[4].

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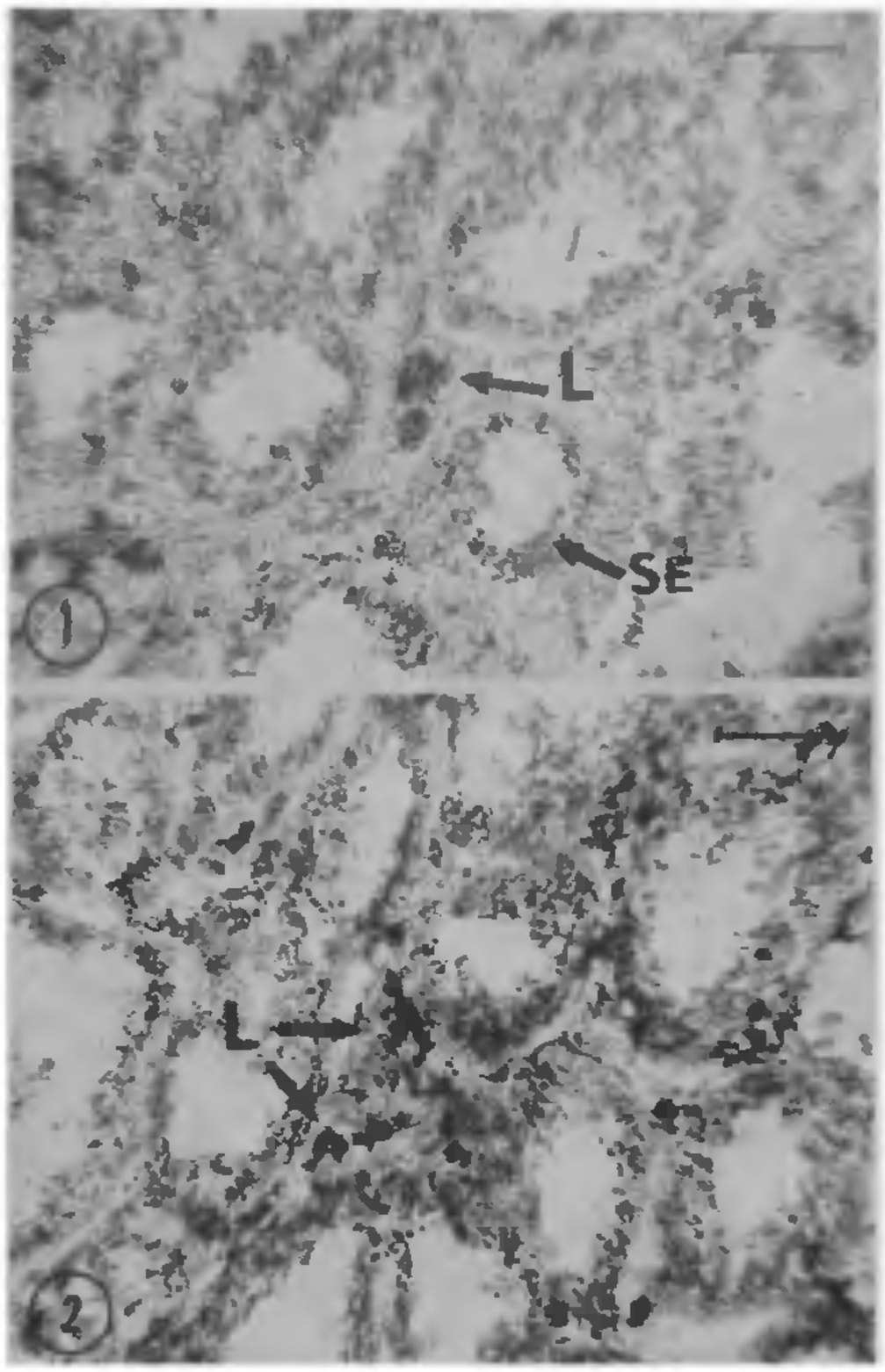
Δ^5-3β-HSDH, 17β-HSDH and G-6-PDH enzyme activities in the testis of hawk, Accipiter badius

Enzyme activity and the substrates used	Intensity of the reaction	
	Leydig cells	Seminiferous epithelium/ Sertoli cells
1. Δ^5-3β-HSDH (DHA and Pregnenolone)	+++	+±
2. 17β-HSDH (17β-estradiol and Testosterone)	+	+
3. G-6-PDH (Disodium Salt of D-glucose-6-phosphate)	+++++	+++
4. Control (without substrate)	–	–

The intensity of the reaction is graded from maximum (+++++) to minimum (+); ± indicates traces of reaction and (–) absence of enzyme activity.



FIGS. 1-2. Fig. 1. Δ^5-3β-HSDH enzyme activity in the Leydig cells (L) and Seminiferous epithelium/ Sertoli cells (S.E.) of the hawk testis. Fig. 2. G–6–PDH enzyme activity in the testis of hawk. Note the intense activity in the Leydig cells (L). Scale line indicates 100 mμ.

Pieces of testis (obtained in the month of February—regeneration period) fixed in Bouin's fluid were used for histological observations. The remaining pieces of testis were used for the histochemical assay of Δ^5-3β-hydroxysteroid dehydrogenase (3β–HSDH), 17β-hydroxysteroid dehydrogenase (17β–HSDH) and glucose-6-phosphate dehydrogenase (G–6–PDH) enzymes as described earlier[8,9]. The substrates used and the intensity of reaction obtained for these enzyme activities are listed in Table I.

Histological sections of hawk testis showed the seminiferous tubules containing spermatogonia and primary spermatocytes. The triangular nuclei of Sertoli cells were clearly seen lying in close association with the parietal layer of the seminiferous epithelium. The interstitium contained well-developed Leydig cells. All the enzyme activities occurred principally in the Leydig cells and to a lesser extent inside the seminiferous tubules presumably in the Sertoli cells (Table I). The intensity of reaction however, varied

with the enzyme. The 3β-HSDH (Fig. 1) was moderate and the 17β-HSDH was in traces while the G-6-PDH (Fig. 2) activity was intense.

It is now well established that 3β-HSDH enzyme plays a key role in the early biosynthesis of all the biologically active steroid hormones, while 17β-HSDH has a role mainly in the biosynthesis of sex steroids[5]. The presence of these two enzymes in the Leydig and Sertoli cells of the hawk suggests their ability to synthesize sex steroid hormones as reported earlier for some domestic birds[1-3,7-11]. Further, the presence of an intense G-6-PDH activity in the same sites as that of 3β-HSDH and 17β-HSDH provides an additional indirect evidence for their steroidogenic potential in the testis of hawk since, G-6-PDH is known to generate NADPH needed for hydroxylations during steroidogenesis[12]. It is suggested that in the testis of hawk Leydig cells form the principal site and Sertoli cells may form additional site of steroid hormone synthesis. The fact that the above enzyme activities occurred at the regeneration phase of the testis suggests albeit indirectly that testicular steroids may be involved in the spermatogenetic processes of the hawk.

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THE KARYOTYPE OF *TRICHOGASTER FASCIATUS* (OSPHRANEMIDAE, PISCES)

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Recent improvements in cytological techniques have generated fresh interest among fish cytologists, to study the karyotypes of this group. The present communication, which deals with the chromosomes of a freshwater fish—*Trichogaster fasciatus*, collected from the local ponds, is the outcome of our investigation undertaken to resolve, as far as possible, the discrepancies in the previous reports[1-3].

The somatic metaphases were obtained from the gill epithelium and the meiotic chromosomes from the testes of mature male individuals by the colchicine-Gimsa-air-drying technique. The morphometric analysis is based on the technique of Levan *et al.*[4],

The $2n$, as determined from 10 male and 11 female specimens, was 46. The $2n$ was confirmed by our observations of 23 bivalents in the meiotic metaphases obtained from the testes of the males (Fig. 1). The karyotype was differentiable into 9 pairs of metacentrics, 6 pairs of submetacentrics and 8 pairs of telocentrics (Fig. 2). Thus the fundamental arm number (NF) was 76 and the relative lenghts of the chromosomes ranged between 2·82% and 5·67% in a

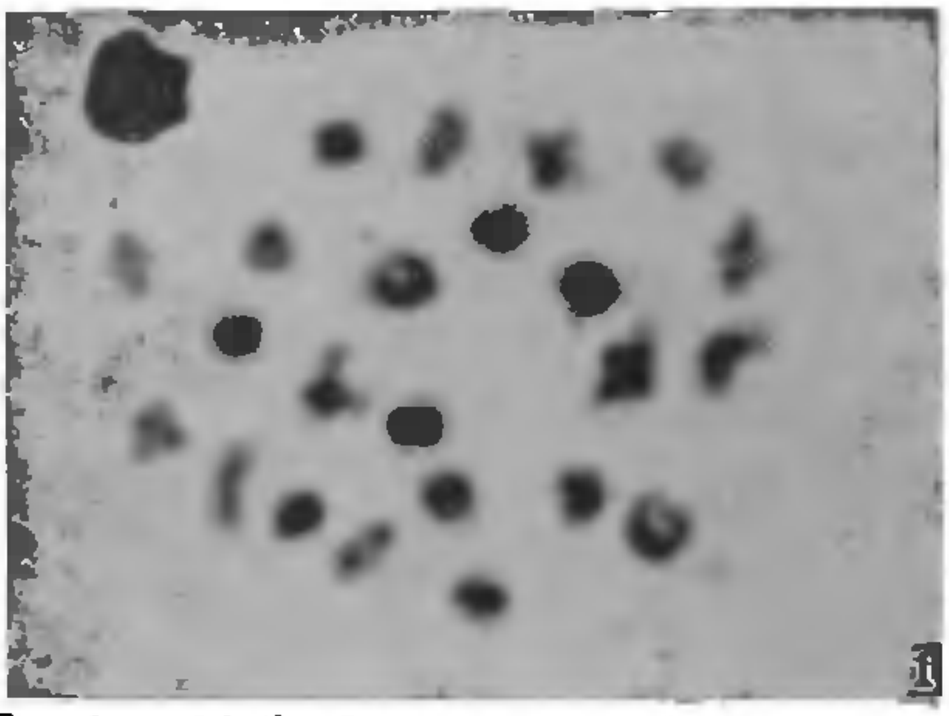

Fig. 1. Meiotic Bivalents of *T. fasciatus*, × 1500.

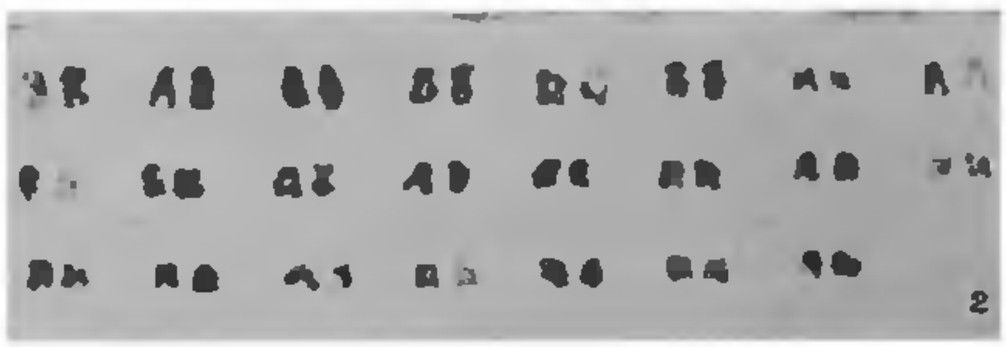

Fig. 2. Karyotype of *T. fasciatus*, × 1500.