

**ULTRASTRUCTURE OF MALE GERM CELLS IN THE
AMAZONIAN PIRARUCU *Arapaima gigas*
(TELEOST, OSTEOGLOSSIDAE)**

Rossana L. L. Venturieri
Departamento de Histologia e Embriologia, Instituto de Ciências Biomédicas,
Universidade de São Paulo. Avenida Professor Lineu Prestes 1524 CEP 05508-
900. São Paulo, SP, Brazil. Phone: 55 11 30917222. Fax: 55 11 30917402. e-
mail: venturie@usp.br

Sergio R. Batlouni. Departamento de Histologia e Embriologia, Instituto de
Ciências Biomédicas, Universidade de São Paulo. e-mail: batlouni@usp.br

Renata G. Moreira. Departamento de Fisiologia, Instituto de Biociências,
Universidade de São Paulo. e-mail: renatagm@ib.usp.br

Geraldo Bernardino. CEPNOR-IBAMA- Belém, PA- Brazil

Maria Inês Borella. Departamento de Histologia e Embriologia, Instituto de
Ciências Biomédicas, Universidade de São Paulo. e-mail: miborell@usp.br

EXTENDED ABSTRACT ONLY- DO NOT CITE

Little is known about the reproductive behavior and physiological aspects that involve the reproduction of the Amazonian Osteoglossidae *Arapaima gigas*. The aim of this study is to characterize ultrastructurally the germ line cells found in the seminiferous epithelium of its testis.

Arapaima gigas adult males kept in tanks were anesthetized and sacrificed with lethal dosages of benzocain. After death the testis was exposed and macroscopically analyzed. Samples of 2mm from different segments of the gonad were fixed by imersion in 2% glutaraldehyde 0.1M phosphate buffer. The fragments were processed to ultrathin sections that were observed in the transmission electron microscope.

The *Arapaima gigas* seminiferous epithelium shows a peculiar array between Sertoli and germ line cells. The spermatogenic unit is the seminiferous cyst, that

is formed by many Sertoli cells, arranged in a concentric way, involving a few germ cells (FIG 1). The germ line cells development within the cysts is synchronous. In some portions of the epithelium a continuous layer of Sertoli cells intercalated with germ cells replaces the seminiferous cysts. As major characteristic, the seminiferous epithelium shows a high number of Sertoli cells and a scarcity of germ line cells, mainly secondary spermatocytes, spermatids and spermatozoa. We also find free Sertoli cells in the lumen of the seminiferous tubules. The spermatogonium presents abundant cytoplasm with many mitochondria, with varied shapes and tubular cristae. Nuages are rarely seen. The spermatogonium nucleus is spherical and filled with noncondensed chromatin, presenting either one or two nucleoli. Primary spermatocytes in leptoten and zygotene phases are distinguished. They have a reduced cytoplasm when compared with the spermatogonium, but they are rich in mitochondria. In the leptoten spermatocytes, lateral elements protrude perpendicularly to the nuclear membrane towards the center of the nucleus (FIG. 1). In zygotene, typical structures of this phase, named synaptonemal complexes, are seen. It is not possible to identify the secondary spermatocytes. Spermatids present a narrow cytoplasmic layer around the head, but an abundant portion of cytoplasm in the intermediary portion. These cells are biflagellated, and an extensive cytoplasmic channel is seen between the flagellum and the intermediary portion. The spermatid head is spherical with condensed chromatin. An implantation fossa is also formed (FIG 2).

The seminiferous epithelium of the *Arapaima gigas* testis shows distinct features when compared with the majority of the teleosts. The seminiferous cysts are not formed by the thin processes of Sertoli cells, but by the juxtaposed cells. The scarcity of germ cells in division process can indicate a low rate of spermatozoa production in the males of this species. The spermatogonium and primary spermatocytes features found in *A. gigas* has the same basic ultrastructure described for many teleosts. The spherical shape of the spermatids head suggests a possible external fertilization in this species.

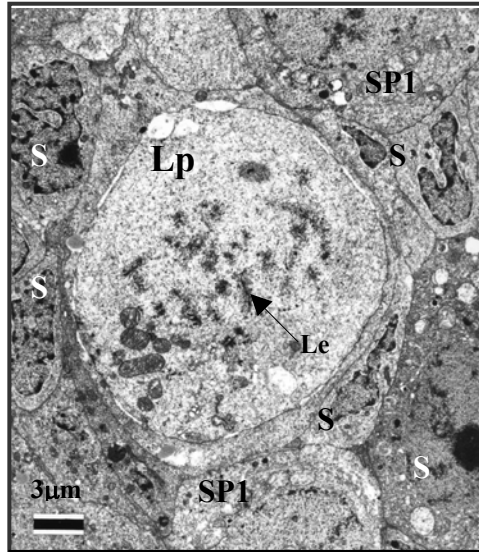


Fig. 1 . Seminiferous cyst formed by Sertoli cells (S) surrounding primary spermatocytes (SP1). It is possible to distinguish a leptotenic primary spermatocyte (Lp) showing lateral elements (Le).

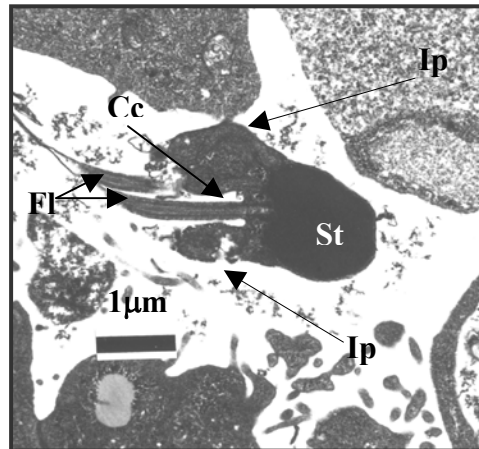


Figure 2. Spermatid (St) showing a spherical head. Both flagella (Fl) are separated from the intermediary portion (Ip) by an extensive cytoplasmic channel (Cc).