ISSN 0975 - 6299 Vol 2 / Issue 3 / Jul - Sept 2011

International Journal of Pharma and Bio Sciences

FISHERY SCIENCE

CELL BIOLOGY

SIGNIFICANCE OF SUPPORTING CELL OF MALE GONAD IN REPRODUCTION OF FRESHWATER FISH *LABEO KONTIU* A SCIENTIFIC AWARENESS ABOUT REPRODUCTION

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ABSTRACT

Reproduction is a vital process provided to all living individuals by the nature itself to reproduce their similar one after death. *Labeo kontius* is used due to easily throughout year availability. Male gonad was removed during different reproductive phases. The nourishing protein contain was recorded by Lowry's method 660nm during matured male gonad as 555±1.5 mg/ml. Sertoli cells were observed on their development and parameters were recorded with the help of phase contrast microscope (Phase contrast-Olympus) as total number of Sertoli cells 15 to19 in number, diameter of the cell 0.1±0.2μ perimeter of the Sertoli Cell 0.1 to 0.01μ in matured testis. Same conditions were used to abnormal male brooder in hatchery the protein contain was comparatively low about infertile male brooder in matured gonad as 14.67mg/ml. The development of Sertoli cell and its parameter were comparatively low as number of Sertoli cells 9 to 12, diameter of the cell 0.5±0.1μ, perimeter of the sertoli cell in male brooder. The lesser development of sertoli cell leads to improper development of Sertoli gives insufficient spem cell count for abnormal fertilization.

KEY WORDS

Labeo kontius, testis, sertoli cell, protein.

INTRODUCTION

Reproduction is a vital process provided to all living individuals by the nature itself to reproduce their similar ones after death. *Labeo kontius* is used due to easily availability throughout year. *Labeo kontius* is important Indian major carps. It is a good brooder used in induced breeding process in Chinese hatchery and to bring perceptual breeding in it. Reproduction in any animal is one of the basic functions to propagate the respective population in a cyclic manner. Fishes have a complicated reproductive behavior and a very typical embryonic development. Morphologically, healthy testis consists of different organelles with in the Sertoli and Leydig's cells, which are really a supportive and functional unit of gonads.

The somatic Sertoli cell in fishes plays an essential role in embryonic determination of a male somatic sex and spermatogenesis during adult life. One individual Sertoli cell sullies a clone of developing germ cells with nutrient and growth factors and it is well established that the number of Sertoli cell.The testes of teleost fishes show greater morphological variation than in other vertebrates (Lofts, 1968; de Vlaming, 1974; Callard et al., 1978). In most cases, testes are a pair of elongated structures composed of branching seminiferous tubules embedded in the stroma.The testis consists of thin-walled tubules or lobules that contain germ cells - the spermatogonia - which are endodermal in origin. Germ cells divide in clusters enclosed by a cyst. Primary spermatogonia - the stem cells - which are present throughout the year, divide mitotically to give rise to secondary spermatogonia which get transformed into primary spermatocytes. They divide by meiosis and give rise to spermatids from which spermatozoa are formed. The seminiferous tubules are packed with spermatozoa in the pro-spawning and spawning periods. Vertebrate testis shows a germinal compartment represented by seminiferous tubules (seminiferous lobules), in which two cell types are found: somatic and germinal. Compared to mammals, Sertoli cell supporting capacity in the teleost Nile tilapia is remarkably high (MATTA *et al.* 2002). The number of mitotic divisions during spermatogenesis to form primary spermatocytes is also species-specific (SCHULZ & MIURA 2002). In mammals, the ratio of germinal cells: Sertoli cells (which expresses the Sertoli cell supporting capacity) is relatively defined for each species (FRANÇA & RUSSELL 1998).

MATERIAL AND METHOD

Labeo kontius was used for male gonadal study and collected from Godavary River near Aurangabad. Fish was dissected and gonad removed fixed with help of formal solution as fixative. The nourishing protein contain was measured by Lowry's method 660nm during matured male gonad. Sertoli cells were observed on their development and parameters were recorded with the help of phase contrast microscope (Phase contrast-Olympus).*Staining* of the section made with reagents Haematoxyline and Eosin

RESULT AND DISCUSSION

Male gonad was removed during different reproductive phases. The nourishing protein contain was recorded by Lowry's method 660nm during matured male gonad as 555±1.5 mg/ml(table-3) Sertoli cells were observed on

their development and parameters were recorded with the help of phase contrast microscope (Phase contrast-Olympus) as total number of Sertoli cells 15±19(table-2) in number, diameter of the cell 0.1±0.2μ(table-2), perimeter of the Sertoli Cell 1 to 3μ in matured testis.

Same conditions were used to abnormal male brooder in hatchery the nourishing protein contain was comparatively low about infertile male brooder in matured gonad as 14.67mg/ml.The development of Sertoli cell and its parameter were comparatively low as number of Sertoli cells 9±12, diameter of the cell 0.8 to 2.5μ perimeter of the Sertoli Cell in male brooder. The lesser development of sertoli cell leads to improper development of Sertoli gives insufficient spem cell count for abnormal fertilization.

1) Photo testis morphology

Morphology of Testis in *Labeo k.*

(B)

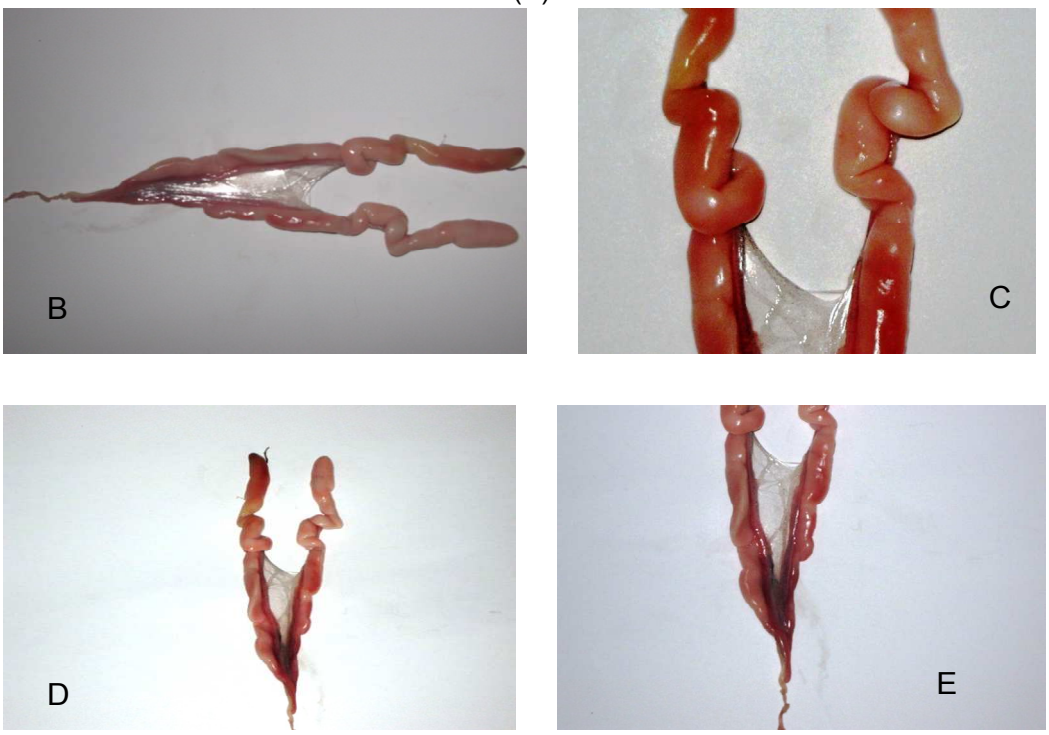
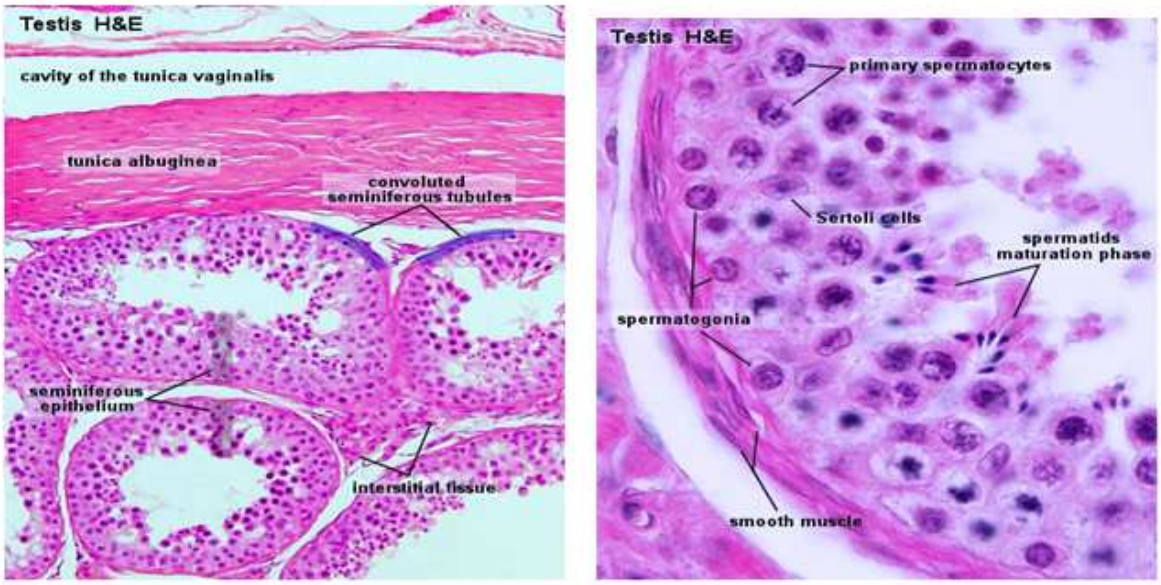


Fig1
Shows testes structure

Ultra structure of Testis showing Sertoli cell- 400X



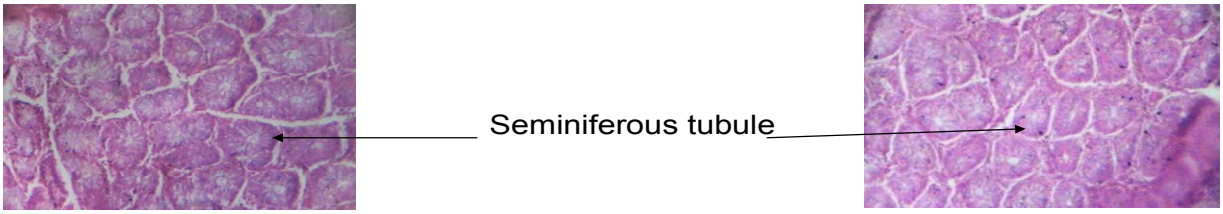


Fig1. Shows testes structure

Table 1
Shows cell parameter

SERTOLI CELL PARAMETER IN MATURING TESTES

Parameter	value
A) Cyst of primary spermatocyte 1) No. of Sertoli cell 2) No. of germinal cell	 1-8 (4.5+1.1) 112-527(340+90)
B) Cyst of primary spermatid. 1) No. of Sertoli cell 2) No. of germinal cell C) Meiotic Index Spermatid: spermatocyte……	 1-5 (4.3+0.4) 115-200 (150+50) 1.1+0.8:1
D) Sertoli cell supporting capacity Spermatid: Sertoli cell spermatocyte: Sertoli cell E) Sertoli cell perimeter	25+4.2 88+4:1 0.8 to 2.5

SERTOLI CELL PARAMETER IN *LABEO KONTIUS* MATURED TESTIS

Parameter	value
A) Cyst of primary spermatocyte 1)No. of Sertoli cell 2) No. of germinal cell	1-10 (4.5±1.1) 112-527(340 ± 90)
B) Cyst of primary spermatid. 1) No. of Sertoli cell 2) No. of germinal cell C) Meiotic Index Spermatid: spermatocyte……	 1-12 (4.3 ± 0.4) 145-800 (450+± 50) 1.9 ± 0.8:1
D) Sertoli cell supporting capacity Spermatid: Sertoli cell spermatocyte: Sertoli cell E) Sertoli cell perimeter	 65 ± 4.2 100-+4:1 1 to 3µ

Table 2
Show a protein contain

PROTEIN CONTAIN IN GONADS

Name of fish	Protein matured gonad (mg/ml)	Protein in immature gonad (mg/ml)
Labeo K.	15.55±0.121	14.52 ±0.151

CONCLUSION

Like all mammals teleosts have Sertoli cell and it performs nursing function for developing and developed spers. It also shows phagocytic function for all debris in the testes due to apoptosis. Improper development of supporting cell of gonads fails to bring proper fertilization. Sometime may tend to infertility also.

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