

Research Article (Open access)

Morphological Study and Role of Gonad Cells in Freshwater Fish- ReproductionM.V. Gaikwad^{1*}, P.K. Banmeru² Y.K. Khillare³¹Department of Zoology, Late Ku. Durga K. Banmeru Science College Lonar, India²Department of Electronics, Late Ku. Durga K. Banmeru Science College Lonar, India³Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (MS), India

ABSTRACT- Reproduction is a vital process provided to all living individuals by nature itself to reproduce their similar one after death. *Channa gachua* is used due to easily throughout year availability. Male gonad was removed during different reproductive phases. The nourishing protein contains was recorded by the Lowry's method 660 nm during matured male gonad as 0.555 mg/ml. Sertoli cells were observed on their development and parameters were recorded with the help of phase-contrast microscope (Phase contrast-Olympus) as the total number of Sertoli cells 150±199 in number, the diameter of the cell 0.1±0.2 m perimeter of the sertoli cell 0.1 to 0.01m in matured testis on the colour intensity. The same conditions were used to the abnormal male brooder in hatchery the nourishing protein contains was comparatively low about infertile male brooder in matured gonad as 0.467mg/ml. The development of the Sertoli cell and its parameter were comparatively low as the number of Sertoli cells 99±120, a diameter of the cell 0.001±0.005m perimeter of the Sertoli Cell in the male brooder. The lesser development of sertoli cells leads to improper development of Sertoli gives insufficient sperms cell count for abnormal fertilization.

Key words- Testis, Ovary, Reproduction, Reproductive phases, Supportive cells, *Channa gachua*

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INTRODUCTION

Reproduction is a vital process provided to all living individuals by the nature itself to reproduce their similar one after death. *Channa gachua* is used due to easily throughout year availability. *Channa gachua* is having important as much as Indian major carps. It is a good brooder used in induced breeding process in Chinese hatchery and to bring perceptual breeding in it. Reproductions in any animals are one of the basic functions to propagate the respective population in cyclic manner.

Fishes have got a complicated reproductive behavior very typical embryonic development. Morphologically, healthy testis consists of different organelles with the cells lie 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 the 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 [1,3]. In most cases, tests are a pair of elongated structures composed of branching seminiferous tubules embedded in the stroma. The testis consists of thin-walled tubules or

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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 [4]. The number of mitotic divisions during spermatogenesis to form primary spermatocytes is also species-specific Schulz *et. al.*[8]. In mammals, the ratio germinal cells: A Sertoli cell (which expresses the Sertoli cell supporting capacity) is relatively defined for each species [5-7].

MATERIAL AND METHOD

Channa gachua was used for male gonadal study and collected from Godavary River near Aurangabad. Fish was dissected and gonad removed, fixed with the help of formal solution as fixative.

The nourishing protein contains was measured by Lowry's method 660 nm during matured male gonad. Sertoli cells were observed on their development and parameters were recorded with the help of the 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 660 nm during matured male gonad as 0.555 mg/ml. Sertoli cells were observed on their development and parameters were recorded with the help of the phase contrast microscope (Phase contrast-Olympus) as

total number of sertoli cells 150 ± 199 in number, diameter of the cell $0.1 \pm 0.2 \mu$ perimeter of the sertoli cell 0.1 to 0.01μ in matured testis on the colour intensity.

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 0.467 mg/ml. The development of Sertoli cell and its parameter were comparatively low as number of Sertoli cells 99 ± 120 , diameter of the cell $0.001 \pm 0.005 \mu$ perimeter of the Sertoli Cell in male brooder. The lesser development of sertoli cell leads to improper development of Sertoli gives insufficient sperm cell count for abnormal fertilization.



Photo 1. Testis in growing phase



Photo 2. Matured testis phase position in *Channa gachua* (Ham-1822)

Fig. 1 Shows Sertoli cells, Ledig's cell and Semniferus tubule

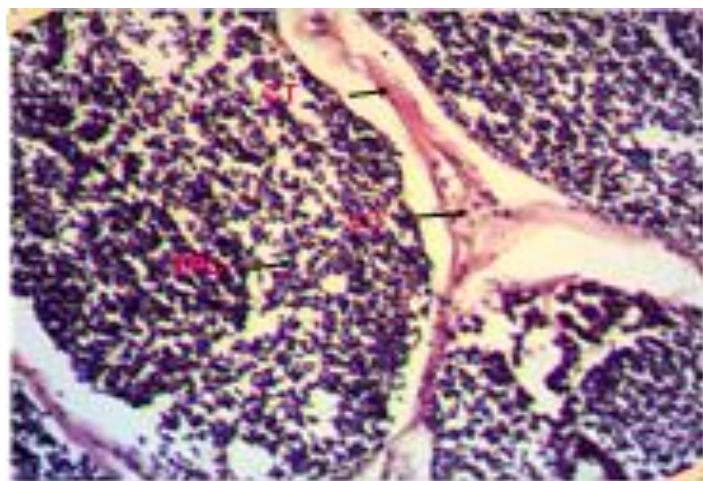
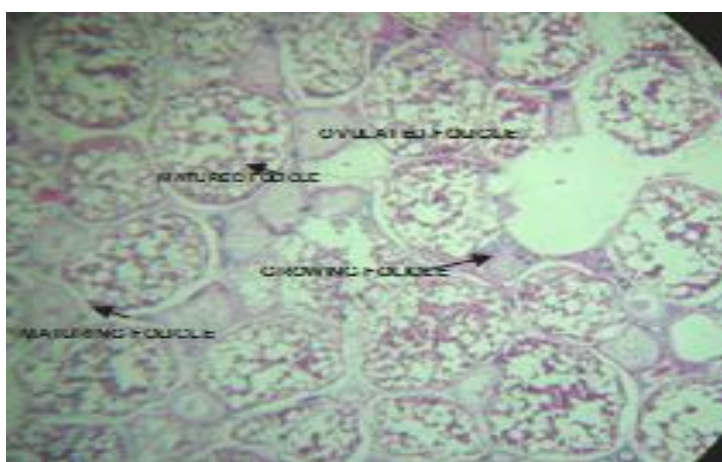


Fig. 2: Shown developing follicles in mature stage of Female *Channa gachua*



100X Microscopic examination

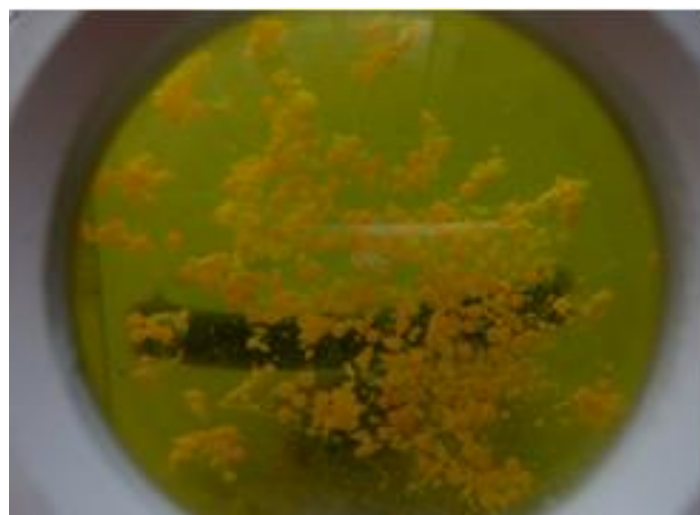


Photo 1. Maturing eggs of *Channa gachua*

Table 1: Sertolicell parameters and its values

SERTOLI CELL PARAMETER	
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	25+4.2 88+4:1

CONCLUSIONS

Like all mammals teleosts have Sertoli cell and it performs nursing function of developing and developed sperms. It also shows the 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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