

# Histomorphological Studies on Ovary of Guppy (*Poecilia Reticulata*) And Development of Follicular Placenta

Jagtap Nandā\*, Mote L.T.\*\*

\*Dapoli Urban Bank Senior Science College, Dapoli. Dist-Ratnagiri, Maharashtra, India

\*\*ASC college Ramanandnagar Kirloskarwadi Dist-Sangli, , Maharashtra, India

## ABSTRACT

### Article Info

Volume 8, Issue 6

Page Number : 275-278

### Publication Issue :

November-December-2021

### Article History

Accepted : 15 Dec 2021

Published: 30 Dec 2021

The larvivorous fish *Poecilia reticulata* was propagated prolifically in the garden for control of mosquito vectors and later redistributed in a number of water reservoirs, in different villages nearby Dapoli. The gravid live bearing females were quickly dissected for their ovaries and embryos. The developed embryo with yellow rounded yolk sac, the remnants of the follicular placental tissue and thick vascular network of connective tissue was also observed.

**Keywords :** Guppy, Follicular Placenta, Embryo, Corpus Luteum.

## I. INTRODUCTION

The critical studies for last 24 decades on the ovary of guppy was not very clear as concerns their histomorphology, histology and histochemistry (Hoar 1969). Besides to this only male guppy had been extensively studied for their sexual dimorphism structure of the gonopodium (Lagler, et.al 1977).

Even recent studies are also related with propagation and redistribution of guppy into different reservoirs. However the basic gonadal histological studies are lacking hence present investigation undertaken for detailed study of ovary and embryonic development of livebearers.

## II. MATERIAL AND METHOD

The fishes were collected from the sewage swamps around the Dapoli and nearby areas. These were

propagated properly in garden ponds. Female required considerable hiding place and proper pond depth. The solitary females were collected with the help of hand net and were brought to laboratory. The fishes were acclimatized for three of four days in the laboratory aquarium. The fishes were fed with meal of dried crustacean larvae regularly.

The females were quickly dissected out for their ovaries. The micro photographs of ovary were taken on the Binocular microscope. The fresh ovaries were preserved in cold calcium formal solution (2% calcium acetate). The tissues were fixed for 24 hours at 4°C and washed thoroughly in the chilled water. The tissues were dehydrated in ascending series of alcohol grades were embedded in paraffin wax (Melting point 58°).

The sections were taken with the help of rotary microtome (spicer type). The sections were cut at 5 to 7  $\mu$ . The sections were employed for the following his two chemical techniques.

1- Routine (HE technique)

2- AB PH 1- (Nalawade 1975)

3- AB PH 2.5 - (Nalawade 1975) Quanterell, G. 1963)

4. PAS technique (Spicer et.al 1967, Nalawade 1975)

The live relation of embryos with ovary was studied in-situ and embryos were fixed in 50% Aceto alcohol and stained with the alcoholic eosin.

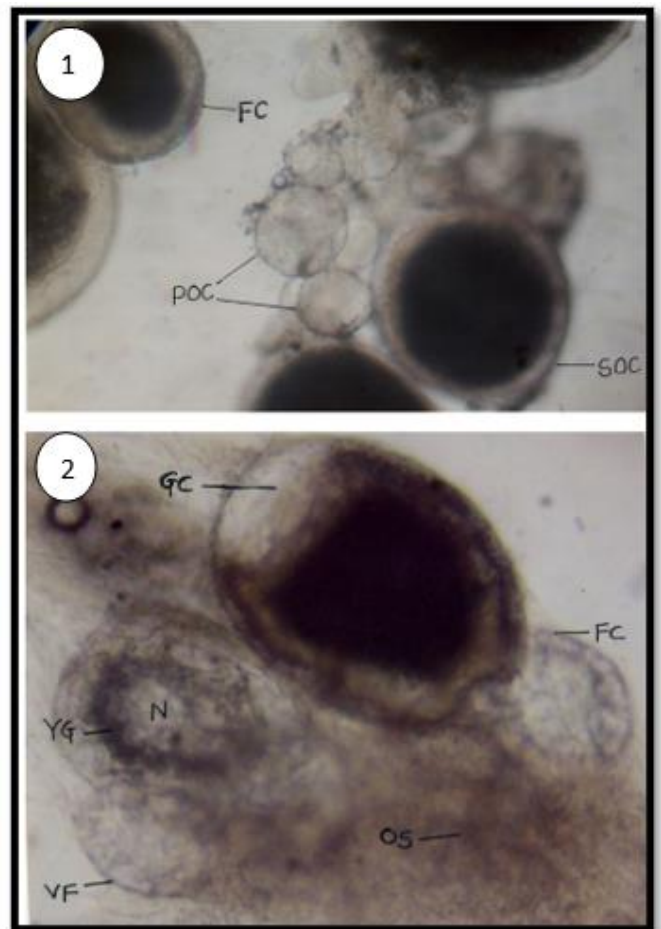
The females were quickly dissected out for their ovaries, embryos and were observed under microscope. The microphotographs of dissected ovary and embryos were taken on the microscopes also the relation of embryos with ovary was studied insitu. The ovaries were fixed in cold calcium formal acetate solution (CAF) for further histological studies.

### III. OBSERVATION AND RESULT

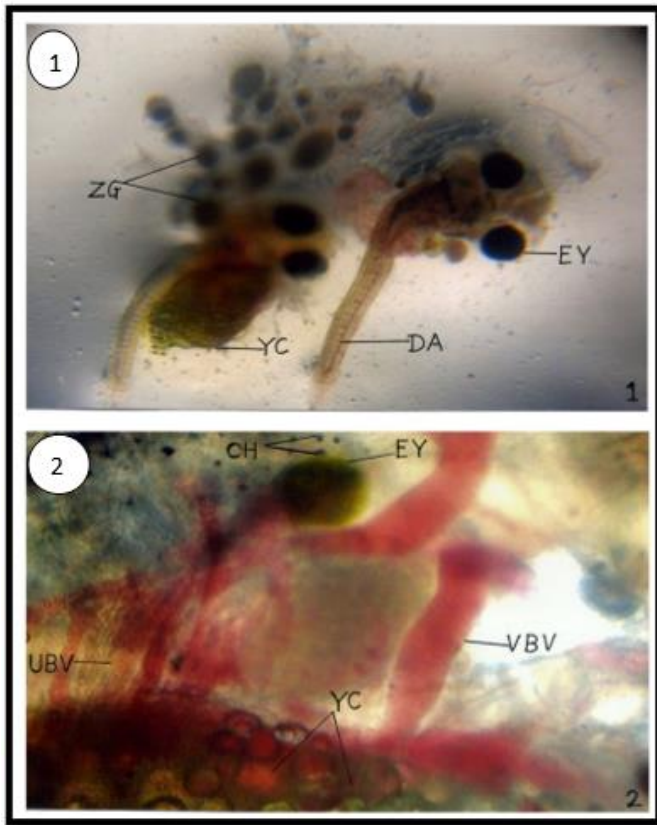
The ovary of *P. reticulata* where observed with budded primordial oogonia and oocytes. (fig.1).The developing young oogonia were transparent and devoid of Yolk deposition. The developing follicles were lined with the cells. A fertilized ovum with grey crescent was observed. The ovaries were characterized by the occurrence of ovarian stroma, germinal epithelium and presence of multiple corpora lutea like structure. The maturing follicles were darker in appearance since there was deposition of yolk. The zygote was observed within the ovary attached with the ovarian stroma. (Fig 2).The zygote was lined with zona radiata and hypertrophied follicular letter called follicular placenta. The ovary showed embryos with yellow rounded yolk sac. (Fig.3)

Almost the time of delivery the Yolk sac where observed prior to gastrulation or morphogenetic movements. The Yolk sac was rapidly reabsorbed in last 2 days of gestation. Prominent eyes at the anterior side, prominent dorsal aorta at posterior region and also developing zygotes were observed. The follicular cells showed hypertrophy at the site of implantation and had connection with the ovarian stroma.

Plate No.1



**Plate No.2**



**Plate No. 1: Caption to Figures**

Fig.No.1 - Ovary of guppy dissected insitu showing many developing oval follicle with follicular epithelium (FC), non-yolk primary oocytes (POC) and secondary oocytes (SOC) X 100.

Fig.No.2 – Freshly dissected ovary of *P. reticulata* showing simultaneously developing two embryos' (EMB) with yolk sac (YC) and other developing zygotes.

**Plate No. 2: Caption to Figures**

Fig No. 1 - Freshly dissected ovary of *P. reticulata* showing simultaneously developing two embryos' (EMB), with yolk sac (YC) and other developing zygotes (ZG) X100.

Fig No. 2 - Freshly dissected embryo of *P. reticulata* with yolk sac and Vitelline circulation. Note the umbilical blood vessels (VBV), Vitelline blood vessels (VBV) connected with yolk sac (YC). Note the well

developed eye (EY) and concentrated chromatophores (CH) in interorbital area X 100.

**Discussion**

Report on the ovary of Guppy had inadequately reported (Hour1957). The ovary is complex structure. It has bilateral symmetry as usual in other vertebrates (Kotpal 1995, Khanna 1984, Verma 1985) but in case of Guppy two ovaries basally united with each other to form the cup like thallus like structure lined with the germinal epithelium however it was found that the two horns of the ovary function ultimately for the physiological division of the labour as reported in fruit bat by Gopal Krishna 1989. The post ovulatory horn of the ovary contains the corpus luteum like structures. The remnants of the placental tissue and thick vascular network of connective tissue but functional horn of ovary characterized with budding oogonia and the maturing follicles. The follicular cells might be involved in the synthesis of yolk or the process of vitellogenesis.

The follicular placenta after the detachment of the fully developed embryo probably might have converted into corpus luteum for steroidal control of the pregnancy (mote 1986), however the hormonal control of pregnancy and delivery might be from the pituitary gland of guppy.

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**Cite this article as :**

Jagtap Nanda, Mote L. T., "Histomorphological Studies on Ovary Of Guppy (Poecilia Reticulata) And Development of Follicular Placenta", International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), Online ISSN : 2394-4099, Print ISSN : 2395-1990, Volume 8 Issue 6, pp. 275-278, November-December 2021. Available at doi : <https://doi.org/10.32628/IJSRSET21866>  
Journal URL : <https://ijsrset.com/IJSRSET21866>