A PROJECT REPORT ON:

# TO STUDY BRAIN STRUCTURE OF BLACK MOLLY FISH

DEPARTMENT OF ZOOLOGY

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

(स्वायत्त) कोल्हापूर

IN THE PARTIAL FULFILLMENT OF BACHELOR OF SCIENCE IN

ZOOLOGY

IN THE YEAR: 2022-2023


NAME– Miss. Dakashta Anil Patil.

NAME– Miss. Priya Prakash Patil.


CLASS B. Sc. III

UNDER THE GUIDANCE OF

Dr. G. K. Sontakke

Dr. T. C. Gaupale

M.Sc. Ph.D.

Assistant Professor,

## DECLARATION

We the undersigned students, declare that the project entitled **"TO STUDY BRAIN STRUCTURE OF BLACK MOLLY FISH"** is submitted by us under the supervision of **Dr. Tekchand Chetanlal Gaupale** Assistant Professor, Department of Zoology, Vivekanand College, Kolhapur (Autonomous).

It is our original work. The empirical findings in this project are based on the data collected by us and it is authenticable to the best of our knowledge. The presented matter is not copied from any other source.

**Place: Kolhapur**

**Date:** 21/04/2023

**Student sign**

**(Miss. Dakshata Anil Patil)**

**(Miss. Priya Prakash Patil)**

# CERTIFICATE

This is to certify that the project entitled, **"TO STUDY BRAIN STRUCTURE OF BLACK MOLLY FISH"'** submitted herewith for the Degree of **Bachelors of Zoology** to the Department of Zoology Vivekanand college, Kolhapur (Autonomous) Affiliated to Shivaji University, Kolhapur, under the faculty of science is the result of the original

work completed by **Dr. Tekchand Chetanlal Gaupale under** my supervision and guidance and to the best of my knowledge and belief, the work embodied in this project

has not formed earlier.

**Place: Kolhapur**

**Date:** 29/4/2023

**Project Supervisor**

**Dr. G. K. Sontakke**
Head,
Department of Zoology
Vivekanand College,
Kolhapur (Autonomous)

**Examiner**

## ACKNOWLEDGEMENT

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I am also thankful to all faculties of Department of Zoology who have directly or indirectly helped and guided during the project work. I am also thankful to non-teaching staff for their constant co-operation during project work

Miss. Dakshata Anil Patil.

Miss. Priya Prakash Patil.

# TO STUDY BRAIN STRUCTURE OF BLACK MOLLY FISH

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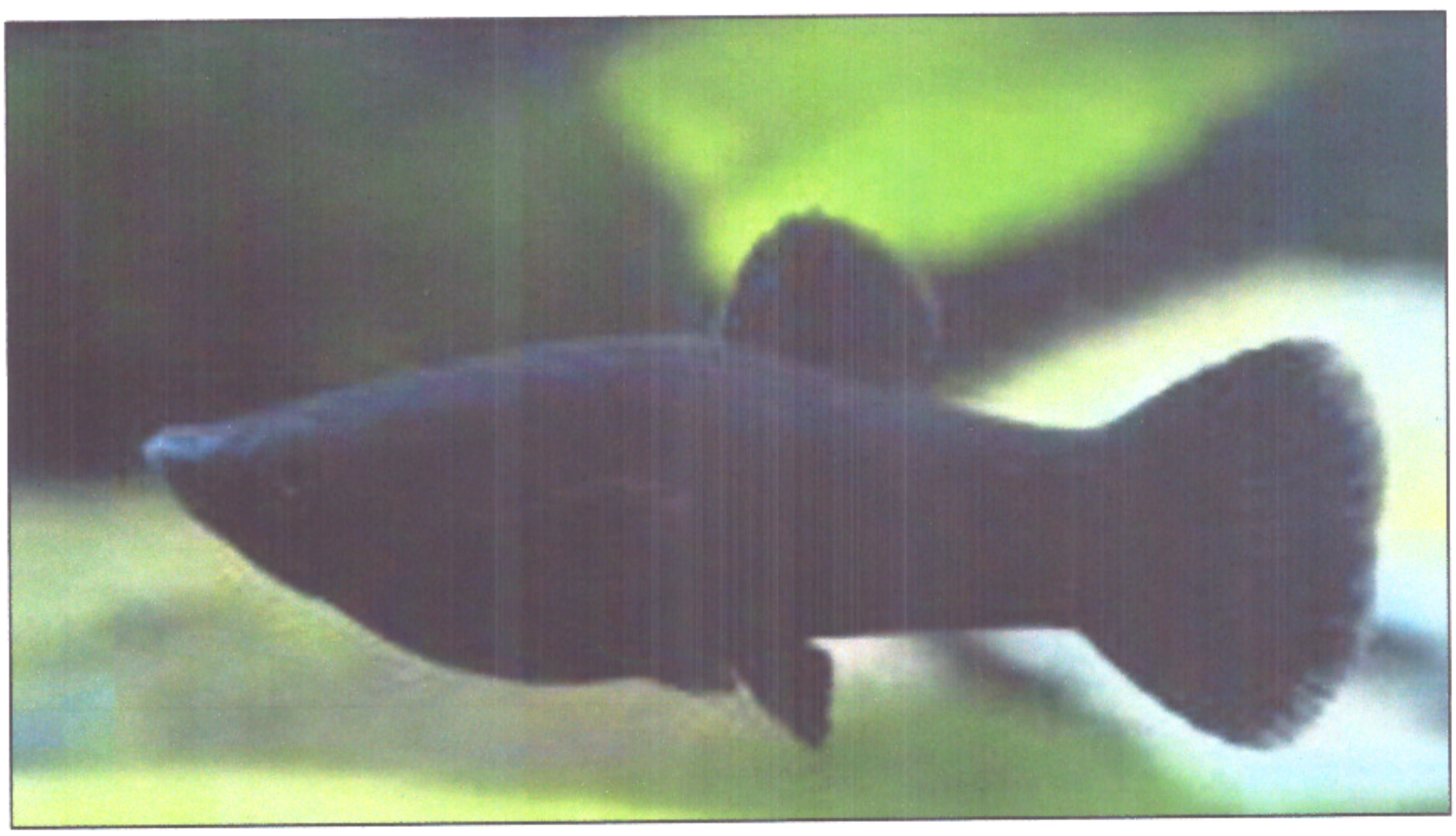
## INTRODUCTION

### Black Molly

The black molly (*Poecilia sphenops)* is small live bearer fish that ranks among the most popular fish in the aquarium hobby. It is native to both South America and Central America, and can be found from Venezuela in the south, to Mexico in the north. It is also found on several Caribbean islands, and in recent years has become established as an invasive species in Japan, parts of the United States and in scattered pockets in Eastern Europe. In the wild they primarily inhabit freshwater streams, but they can also be found living in brackish coastal sea waters and swamps. There is a mistaken belief in the hobby that black mollies are a brackish water fish, and while they are highly adaptable to salt water conditions, they prefer a freshwater environment



Dia. Black Molly fish

## *SCIENTIFIC CLASSIFICATION*

| | |
|---|---|
| KINGDOM | Animalia |
| PHYLUM | Chordata |
| CLASS | Actinopterygii |
| ORDER | Cyprinodontiformes |
| FAMILY | Poecilidae |
| GENUS | *Poecilia* |
| SPECIES | *sphenops* |

**BINOMIAL NAME**: *Poecilia sphenops*

- **MORPHOLOGY**

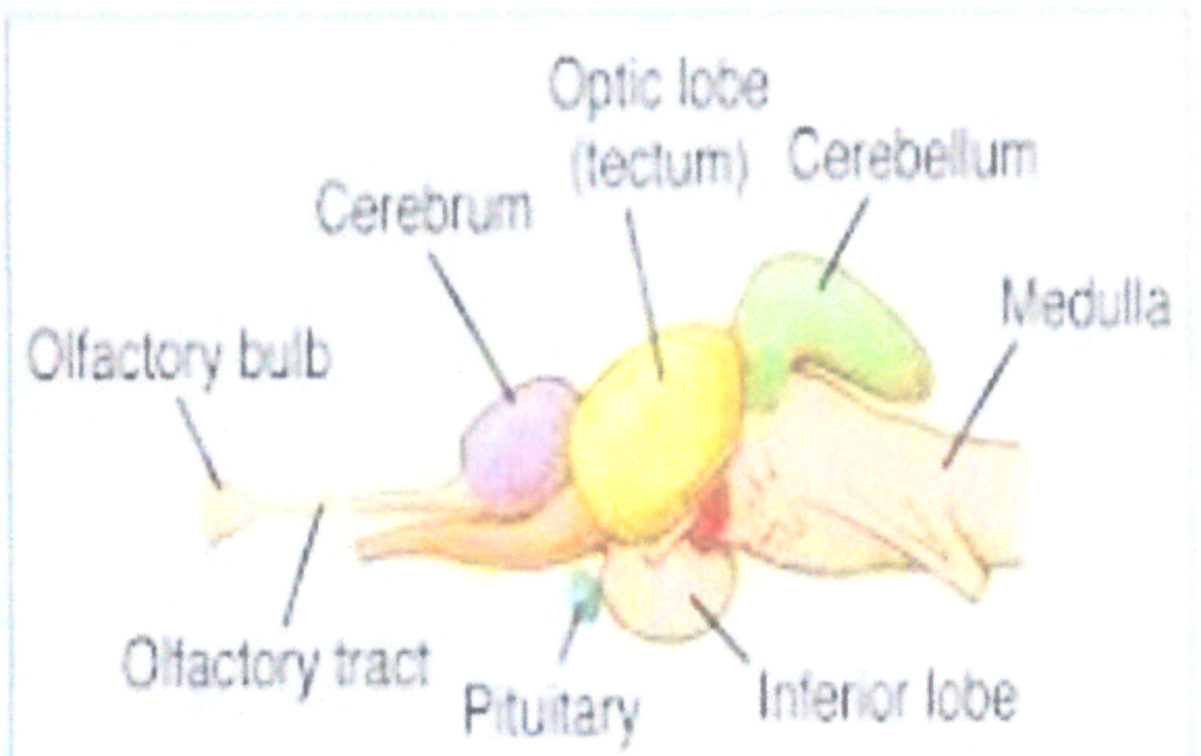
  *Poecilia sphenops* is a teleost fish, of the genus *Poecilia,* known under the common name molly; to distinguish it from its congeners, it is sometimes called short-finned molly or common molly. They inhabit fresh water streams and coastal brackish and marine waters of Mexico. The wild-type fishes are dull, silvery in colour. The molly can produce fertile hybrids with many *Poecilia* species, most importantly the salifin molly. The male mollies generally tend to be mildly aggressive .Mollies rank as one of the most popular feeder fish due to high growth rate, birth size, reproduction, and brood number

  - Common name: Black Molly
  - Scientific name: *Poecilia Sphenops*
  - Average Adult Fish Size: 5-10 CM
  - Place of Origin: Central America

Typical Tank setup: Molly's are a very popular aquarium fish, and don't require anything special. A peaceful community aquarium with at least 2 females should be kept to each male. So they aren't continually harassed. Also for the same reason, a tank housing both male and female Molly's would ideally contain plants so the females can get out of the way of the male,

- Recommended Minimum Aquarium Capacity: 5 gallon/20 liter
- Compatibility: Peaceful community tank mates like Platy's, Guppies and Tetra's.

- Temperature: 21-28 Degree C/70-82 Deg F
- Water chemistry: pH 7.5-8.5
- Feeding: Molly's should be fed once or twice a day. It is very important not to over-feed your Molly. All food should be consumed after just a few minutes. If not, you are feeding your Molly to much food in one serving. You can buy flake food specially made for tropical fish, such as the Molly in your fish store. A flake food diet is a good base for the Molly, but should ideally be supplemented with live food. Your Molly will survive on flake food alone, but the live food makes the Molly well-nourished and healthier. Live or frozen Brine Shrimp is a popular Molly fish food since Brine Shrimp is very easy to produce at home. Bloodworms, Micro Worms, Fruit Flies, Mosquito larvae, Daphnia and chopped up Earthworms are other examples of suitable food for your Molly (Lehmann, and Phillips, 1994)
- Sexing: Males are more slender, females more round. Males also have a modified anal fin.



Fish Brain

Generally the nervous system of fish brain consists of fore brain, mid brain. Hind brain. The central nervous system consists of a brain and a spinal cord. Fish brains are divided into several regions. At the front are the olfactory lobes, a pair of structures that receive and process signals from the nostrils via the two olfactory nerves. Similar to the way humans smell chemicals in the air, fish smell chemicals in the water by tasting them. The olfactory lobes are very large in fish that hunt

primarily by smell. Behind the olfactory lobes is the two-lobed telencephalon, the structural equivalent to the cerebrum in higher vertebrates. In fish the telencephalon is concerned mostly with olfaction Together these structures form the forebrain. (Volf.N.Schartl M. (2001)).

The forebrain is connected to the midbrain via the diencephalon .The diencephalon performs functions associated with hormones and homeostasis. The pineal body lies just above the diencephalon. This structure detects light, maintains circadian rhythms, and controls colour changes The midbrain or mesencephalon contains the two optic lobes. These are very large in species that hunt by sight, such as rainbow trout and cichlids. The hindbrain or metencephalon is particularly involved in swimming and balance. The cerebellum is a single-lobed structure that is typically the biggest part of the brain. The brain stem or myelencephalon is the brain's posterior. As well as controlling some muscles and body organs, in bony fish at least, the brain stem governs respiration and osmoregulation (Ito et al., 2007). The central nervous system is based on a hollow nerve tube running along the length of the animal, from which the peripheral nervous system branches out to innervate the various systems. The front end of the nerve tube is expanded by a thickening of the walls and expansion of the central canal of spinal cordinto three primary vesicles brain. The prosencephalon (forebrain), mesencephalon (midbrain) and rhombencephalon (hindbrain). Two laterally placed eyes form around outgrows from the midbrain (Ito et al., 2007)

## MATERIAL AND METHOD-

### Materials:

Stereomicroscope, light microscope, slides, cover slips .needle .blades, rectified spirit .spirit lamps, Scissors, beakers .Petri dish, brush.

Chemicals: fish tank. Molly fish, Bouin's fixative, alcohol grades, xylenes clearing agent, distilled water, paraffin wax for hot impregnation. Cresyl violet

Bouin's fixative = picric acid +glacial acetic acid +formaldehydes

75ml + 05 ml + 25ml

## METHODOLOGY:

- **Maintenance of black Molly fish:**

  The black Molly fish were purchased from regular aquarium shop, brought to laboratory and maintained in fish tank containing water with oxygen supply. The fish were kept in Laboratory conditions to adapt laboratory conditions nearly about five days.

- **Scarifications of black Molly fish:**

  After the five day, the fish were anesthetized with the help of formalin or clove oil.

- **Dissection of brain of black Molly fish**

  Then the brain of black Molly fish was dissected and fixed in Bouin's fixative for 24 hours.

  After fixation of brains these tissues are proceed for block making after washing.