



# DISTRIBUTION OF PUTATIVE DOPAMINERGIC NEURONS AND IDENTIFICATION OF D2 RECEPTORS IN THE BRAIN OF FRESHWATER MURREL, *CHANNA PUNCTATUS*



Shweta Dhindhwal

Department of Zoology, University of Delhi, Delhi-110007, India

## Introduction

Dopamine is an essential neurotransmitter in the central nervous system of all vertebrates and plays an important role in motor function, learning and behavior, sensory activity etc. One of the important functions of dopamine is release of pituitary hormones. It is synthesized from the amino acid tyrosine. Two types of dopamine receptors, D1-like and D2-like, have been reported in fish. Dopamine containing neurons are located in the olfactory bulbs, the ventral regions of the pre-optic area and tuberal hypothalamus. The inhibitory effect of dopamine on pituitary gonadotropin production is mediated by D2 type receptors. Dopamine inhibition has important implications for aquaculture because captive conditions often lead to a blockage of oocyte maturation and ovulation.

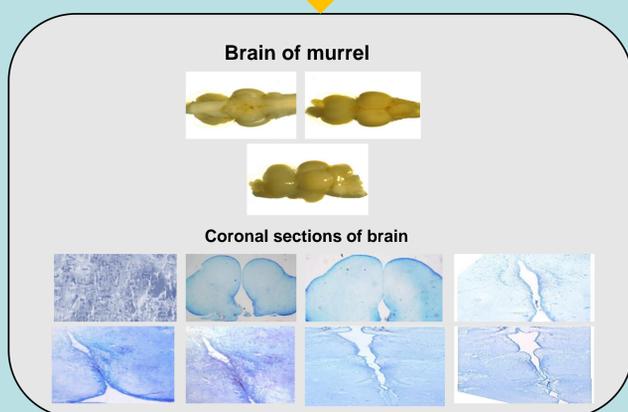
## Objectives

- ❖ Distribution of putative dopaminergic neurons in the brain using cresyl violet staining
- ❖ Identification of DA-D2 receptor in the brain
- ❖ Effect of stress on neurosecretory material

## Methodology & Results

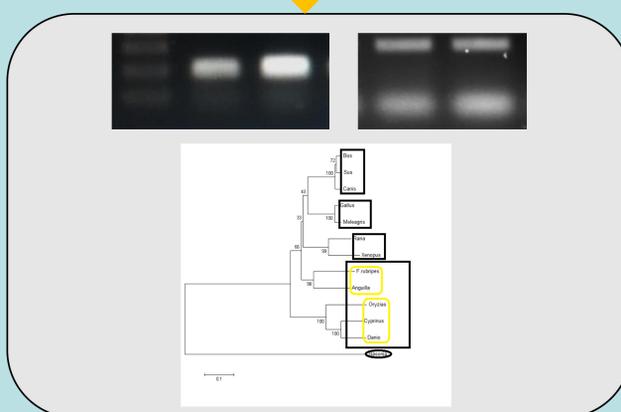
### Distribution of putative dopaminergic neurons in the brain using cresyl violet staining

1. Fixation of tissue
2. Processing of tissue  
Washed in distilled water for 1 hour (twice)  
↓  
Dehydrated in ascending series of ethyl alcohol  
↓  
Cleared in xylene  
↓  
Embedded in paraffin wax at 60°C
3. Sectioning & staining with cresyl violet



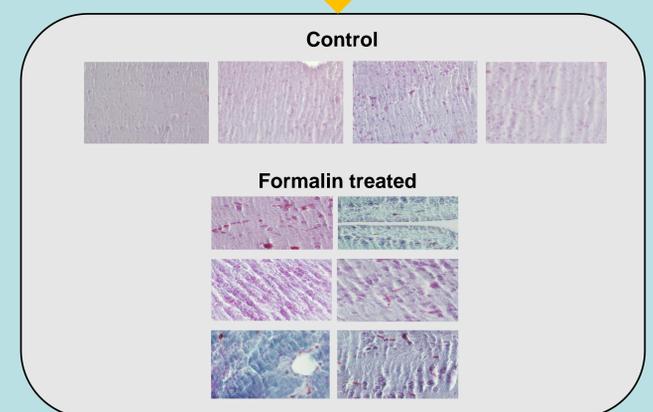
### Identification of DA-D2 receptor in the brain

- Tissues were excised  
↓  
Isolated RNA  
↓  
cDNA was synthesized  
↓  
Gene amplified by PCR  
↓  
Nucleotide sequence analysis using BLAST  
↓  
Phylogenetic analysis



### Effect of stress on neurosecretory material

- Fish are divided into two equal groups: control & formalin treated (200µl of 2% formalin for four days)  
↓  
Brains removed & fixed in bouin's fluid  
↓  
Tissues were washed in distilled water, dehydrated in ascending series of ethyl alcohol, cleared in xylene and embedded in paraffin wax at 60°C.  
↓  
Sectioning & staining in mallory's triple stain.



## Conclusion

- ❖ The present study demonstrates expression of D2 receptor in brain of murrel.
- ❖ The sequence of D2 receptor revealed a high degree of identity with D2b receptor of *Oryzias latipes*. Also it showed 76% identity with mammalian D2 receptor which suggests its conservice during evolution.
- ❖ Formalin treatment of *Channa punctatus* induced hypertrophy in the NPO (nucleus preopticus) and NLT (lateral tuberal nucleus) neurosecretory cells

## Acknowledgement

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## References

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