

PROJECT INFORMATION

Fish Biodiversity Survey, Inventory, and Documentation from Streams and Rivers in Notified Government Forest and Protected Areas of Goa for Conservation and Management

PROJECT OVERVIEW

Funding Agency	Forest Department, Govt of Goa
Total Outlay	8 Lakhs
Duration	2 Years
Single / Multi-Institutional	Single
Principal Investigator	Shri Trivesh S. Mayekar
Co-Investigators	Dr. Sreekanth G.B.

RATIONALE

Forests of Goa form the part of Western Ghats, the region which have been internationally recognized as Biodiversity Hotspot of the world owing to its rich flora and fauna. Most of the Goan forests are located in the eastern region of the state. The forests of Goa are known for their grandeur and majesty. They are like a green pearl of the tourist paradise state (Patil, 2023). From Moist Mixed Deciduous Forests to Sub-Tropical Hill Forests, from Semi-Evergreen Forests to Evergreen Forests, The forests are the life supporting systems of the state as they are the store house of precious rivers & other natural resources. Goa is bestowed with rich biodiversity, and the Western Ghats which is one of the mega biodiversity hotspot in the world runs across the state. There are 6 Wildlife Sanctuaries and 1 National Park, most of which forms the part of Western Ghats and also harbors many endemic and globally threatened species. It also has a wide range of many unique species of flora and fauna. Goa, has a rich diversity of freshwater fish species due to its network of rivers, streams, ponds, and lakes. These water bodies provide a diverse habitat for various freshwater fish. Goa's freshwater ecosystems, including streams and rivers within protected forested regions, are an integral part of the Western Ghats, one of the world's biodiversity hotspots. These water bodies support a wide range of fish species, many of which are endemic or have not been thoroughly documented. However, rapid urbanization, habitat destruction, water pollution, and climate change pose significant threats to these ecosystems. The lack of comprehensive data on fish biodiversity in these areas limits conservation efforts and the formulation of effective management strategies. The freshwater ecosystems are the most threatened ecosystems globally (Sala et al., 2000) and are facing pressures with regards to

stability of the ecosystem and its biodiversity (Cowx, 2002; Cooke and Suski, 2008). Western Ghats and are included amongst the top eight most important hotspots in the world (Raghavan et al., 2016). Western Ghats runs from north to south and traverse the states of Gujarat, Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu (Arunkumar et al., 2018). It is rich in diversity of flora and fauna and is listed amongst the 25 global biodiversity hotspots with high level of endemism (Dahanukar et al., 2004). It is also rich in freshwater fish fauna (Arunkumar et al., 2018). More than 300 freshwater fish species are reported from Western Ghats (Kumar and Devi 2013). This study is crucial as it will provide a systematic inventory and documentation of fish species in protected areas, contributing to the understanding of their ecological significance, habitat requirements, and threats. It will also help develop conservation strategies to protect these ecosystems and support sustainable fisheries management in Goa.

RESEARCH GAPS

1. What is the current status of fish biodiversity in the streams and rivers of Goa's protected areas and notified government forests?
2. What are the abundance, distribution patterns and habitat preferences of the identified fish species?
3. Which fish species are endemic, threatened, vulnerable or rare in these ecosystems (IUCN status) ?
4. What are the major threats affecting fish biodiversity in these protected freshwater ecosystems?
5. How can the collected data contribute to the conservation and sustainable management of these ecosystems?

OBJECTIVES

1. To conduct a systematic survey of fish biodiversity in streams and rivers within notified government forests and protected areas in Goa.
2. To create an inventory of fish species, including their distribution, abundance, and habitat preferences.
3. To document indigenous and endemic fish species and assess their conservation status.
4. To identify potential threats to fish biodiversity in these ecosystems.
5. To provide recommendations for conservation and sustainable management of freshwater fish biodiversity in Goa.

ACTIVITIES

Preliminary survey and identification of sampling stations
Field Surveys, Fish sampling & Data Collection
Fish Identification & Documentation, Preservation
Data Analysis & Report Writing, publication
Awareness Workshop

EXPERIMENTAL DETAILS

Treatment: NA

Fertilizer Doses	NA
Variety	NA
Replications:	NA
Observations:	Species identity, local name, and number of individuals per station Total length (cm) and body weight (g) of specimens GPS coordinates, altitude, and date/time of sampling Water temperature, pH, dissolved oxygen, turbidity, and conductivity Stream width, depth, flow velocity, and substrate type Riparian vegetation and canopy cover Gear used and fishing effort (catch per unit effort) Presence of exotic or invasive species Signs of threats: pollution, sand mining, dams, destructive fishing Breeding condition or juveniles observed (seasonal) Photographs and voucher specimen numbers
GPS Coordinates:	NA

EXPECTED OUTPUT

Georeferenced inventory and digital database of fish species from Goa's protected areas and notified forests. List of endemic, rare, and threatened species with IUCN status, distribution maps, and threat assessment. Illustrated Fish Biodiversity Atlas, backed by a voucher specimen reference collection at ICAR-CCARI. Conservation guidelines for the Forest Department, one publication, and one community awareness workshop.

EXPECTED OUTCOME

- Comprehensive inventory of fish species from the streams and rivers of protected areas and notified Government forests in Goa.
- Identification of endemic, threatened, and rare fish species.
- Documentation of fish habitat preferences and seasonal variations in fish species diversity.
- Recommendations for conservation strategies and habitat management plans.

FIELD INFORMATION

When the field was developed:	NA
What are crops being cultivated season-wise:	NA
Soil type:	NA
Soil pH, EC, OC:	NA
Soil depth:	NA
Soil NPK and Micronutrient status:	NA

Common pests and diseases:

NA