



# Ornamental Fish Fauna of Adda Hole: Kabbinala Forest Range, Southern Western Ghats, Karnataka, India

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## Abstract

*Adda-hole stream is a 14 km long perennial stream belonging to Kabbinala forest of Gundia region. It is free from pollution and has different habitats, each with diverse ornamental fish population. The ornamental fish of Adda-hole was studied between April 2011 and April 2012. This study revealed a total number of 17 different species of fish belonging to 9 different families, of which 7 species are endemic. According to the IUCN (2011), C. imitator and E. canarensis have been analysed as Data Deficient and Endangered respectively. These two species are restricted to Southern Western Ghats. So far, there is no record of any alien fish species which could be a threat to the ornamental fish fauna. This particular study indicates that this stream can be considered for conservation of some endemic ornamental fishes in Western Ghats.*

**Keywords:** Adda-hole, western Ghats, ornamental fishes, conservation.

## Introduction

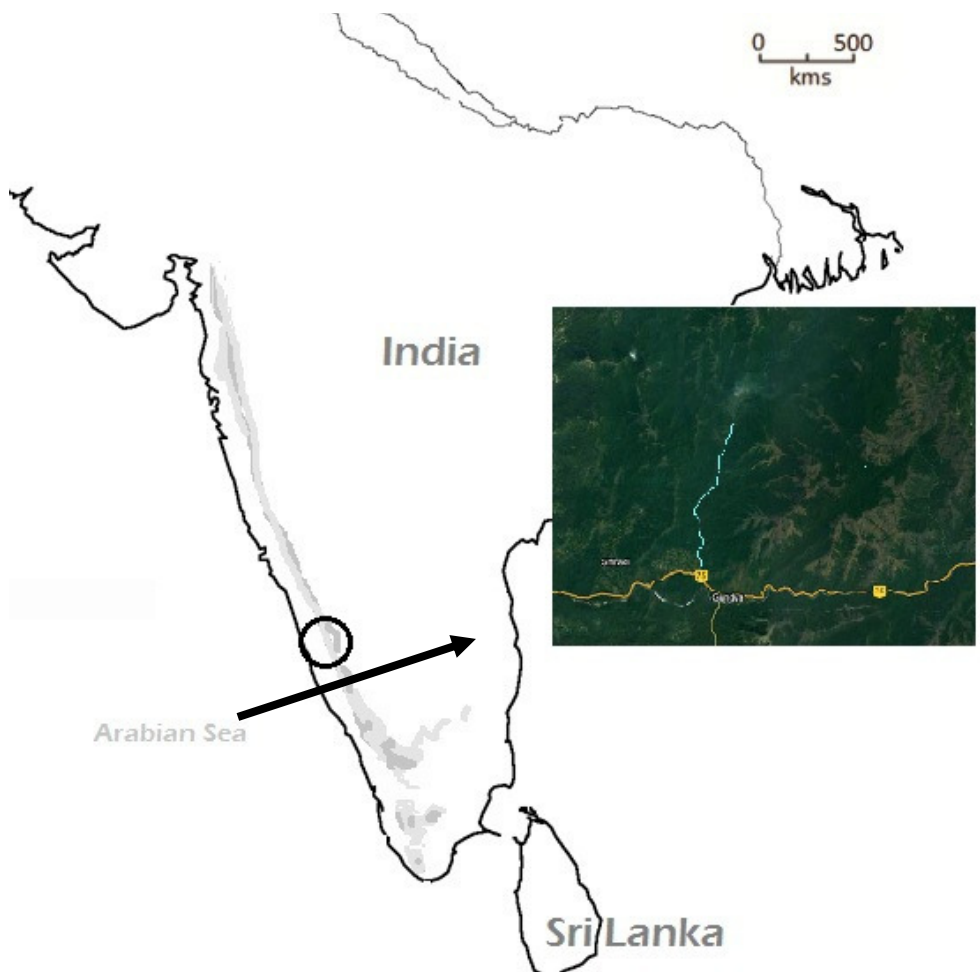
The Western Ghats are considered to be one of the 18 "Biodiversity hotspots" in the world<sup>1</sup>. They are home to a lot of perennial rivers and one can find innumerable streams and waterfalls with rich fish diversity. Ponnaiah and Gopalakrishnan<sup>2</sup> have recently compiled various studies on endemic fishes in different streams and rivers of the Western Ghats. Diversity of fish in a few selected streams of north Karnataka<sup>3</sup> and Central western Ghats<sup>4,5</sup> have been reported by many researchers<sup>4,5</sup>. The Western Ghats is known for its rich freshwater fauna with high levels of endemism as studied by Shaji et al<sup>6,7</sup>, Dahanukar<sup>8</sup>. Of the 300 species of fishes inhabiting the, different river systems of the Western Ghats, 155 are considered as potential ornamental fishes and 120 species are endemic. However, despite the abundance of ornamental fishes, only few have received attention from fish traders in the global market. The few species exported from India are collected and directly sent to traders, as a result of which many endemic species have become endangered as mentioned by Anna et al<sup>9</sup>.

*Adda-hole* is a perennial stream of *Kabbinala* Forest, which is free from pollution, located in southern Western Ghats, near the Gundia check post. The study area is close to the proposed GundiaHydel Power Project, which has been analyzed as a threat to the flora and fauna in the region by Centre for Ecological Sciences (IISC Bangalore)<sup>10</sup>. Many areas in the region are still unexplored and so there is no check-list of ornamental fish for this region. Hence, the present study was undertaken to document diversity of ornamental fish, which will help in assessing any possible threat to the ornamental fishes and their status.

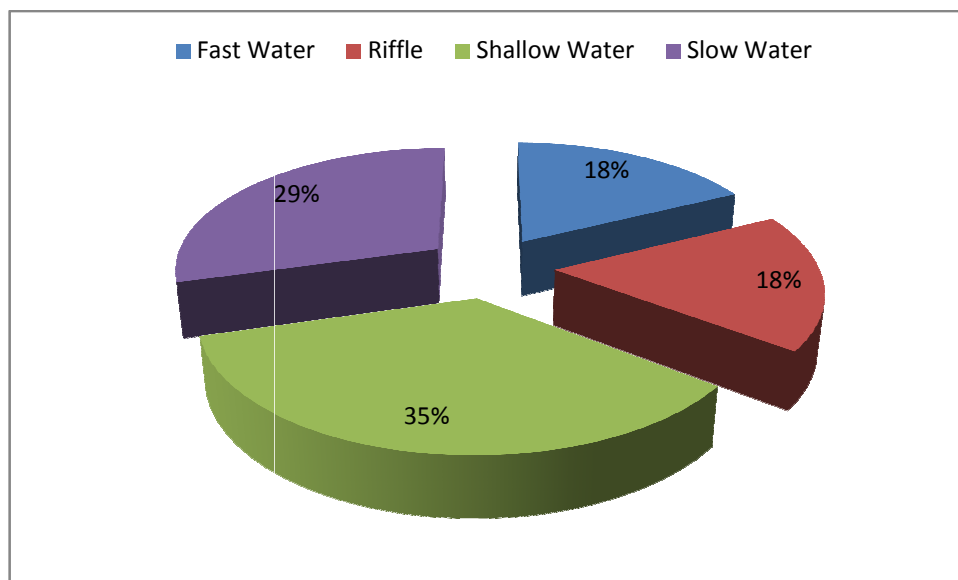
## Material and Methods

**Study Area:** *Kabbinala* forest (covering an area of 6072.9 ha.) belongs to the Hassan District Division, Sakleshpur range, Karnataka Forest Division. This forest is located alongside NH-48 about 2km from the Gundia check post. There are several small streams in the forest joining one main stream called "*Adda-hole*". Almost 70 % of the stream has riparian forest cover. Water at most places is clear with sandy, rocky bottom. At some places one can find leaf litter at the bottom. This stream is a small tributary of the *Kempu-hole* River and is an important stream draining from *Ombattu Gudda* peak which is highest in the region (height 1720m). The annual rainfall is about 3000mm and the temperature ranges from 25°C to 35°C. The topography of this region is undulating, the elevation range ranging from 500 meters to 1720 meters.

**Sampling:** Fish sampling was carried out along the stream at a distance interval of about 400 m every fortnight during April 2011 to April 2012. Assorted types of fishing gear, like cast nets (9', 1"; 9', 1/2") and drag nets (with different mesh sizes) were used to collect the fish. 10 to 15 sweeps were done using the different nets to catch fish. Relative abundance was then grouped into four major categories, namely: abundant (76-100% of total catch), common (51-75% of total catch), moderate (26-50% of total catch) and rare (1-25% of total catch) as followed by Dahanukar. N et al<sup>11</sup>. Fish caught were examined, photographed and released into the water. Fishes were identified based on the key for fishes of the Indian subcontinent by Jayaram, Jhingran and Talwar<sup>12-15</sup>. All micro habitats like riffle zone, pools, cascade, falls, run and plunge were considered and classified based on methods described by Puset et al.<sup>16</sup> as fast water, slow water, shallow water and riffles.



**Figure-1**  
Satellite Image showing the Western Ghats and Adda Hole in Southern Western Ghats, Karnataka India



**Figure-2**  
Habitat wise distribution of Fishes in Adda Hole

**Table-1**  
**List of Ornamental fish from Adda Hole (A: Abundant, C: Common, M: Moderate, R: Rare)**

Sl no	Scientific name and Family of Species	Common name	Habitat	Abundance
	<b>Family: Cyprinidae</b>			
1	<i>Bariliusbakeri</i>	Malabar Baril	Fast Water	M
2	<i>Danioaequipinnatus</i>	Giant danio	Riffle	C
3	<i>Devariomalabaricus</i>	Malabar Danio	Riffle	C
4	<i>Garramullya</i>	Kallukorava	Fast Water	M
5	<i>Puntiusfasciatusfasciatus</i>	Melon barb	Shallow Water	A
6	<i>Puntiusfilamentosus</i>	Filament Barb	Shallow Water	M
7	<i>Puntiusnarayani</i>	Narayan barb	Shallow Water	M
8	<i>Puntius sophore</i>	One spotted Barb	Shallow Water	M
9	<i>Rasboradaniconius</i>	Striped Rasbora	Shallow Water	A
	<b>Family: Aplocheilidae</b>			
10	<i>Aplocheiluslineatus</i>	Killi fish	Slow Water	M
	<b>Family: Tetraodontidae</b>			
11	<i>Carinotetraodon imitator</i>	Dwarf Puffer	Slow Water	C
	<b>Family: Nemacheilidae</b>			
12	<i>Schisturasps</i>	Hill stream loach	Shallow Water	C
	<b>Family: Channidae</b>			
13	<i>Channagachua</i>	Snake head fish	Slow Water	C
	<b>Family: Balitoridae</b>			
14	<i>Bhavaniaaustralis</i>	Western ghats loach	Fast Water	R
	<b>Family: Belonidae</b>			
15	<i>Xenentodoncancila</i>	Freshwater Garfish	Riffle	M
	<b>Family: Ambassidae</b>			
16	<i>Parambasisranga</i>	Indian Glass Fish	Slow Water	R
17	<b>Family: Cichlidae</b>			
	<i>Etropluscanarensis</i>	Canara Pearl spot	Slow Water	R

## Results and Discussion

Totally, 17 Species of ornamental fish were found belonging to 9 different families. Of these families, Cyprinidae family was the most dominant with 9 species. Previous studies by Mohite et al<sup>18</sup>, Johnson et al<sup>19</sup>, Wakid et al<sup>20</sup>, Tamboli et al<sup>29</sup>, Chaudary et al<sup>30</sup> also say that Cyprinidae family is dominant in rivers and streams of Western Ghats and other water bodies. There were 7 endemic ornamental fishes, Out of which 2 are endemic specifically to southern Western Ghats (*Carinotetraodon imitator* and *Etropluscanarensis*). Of the 17 species recorded, 2 are abundant, 7 common, 5 moderate and 3 rare in the study area, as shown in table 1.

*C. imitator* is one of the least known freshwater ornamental fish of Western Ghats. There is hence an urgent need to generate baseline information on its actual distribution, population status, life history and ecology. IUCN<sup>21</sup> has classified the *Carinotetraodon imitator* as Data Deficient. *Etropluscanarensis* has been classified under Endangered Species with restricted distribution. *Bhavaniaaustralis*, *Devariomalabaricus*, *Baraliusbakeri* and *Puntiusnarayani* have been classified as Least Concern, but according to IUCN<sup>21</sup> study, these species still require further research and conservation as habitat decline could be a possible threat. These fishes were also found and

studied in Kumaradara River, Southern Western Ghats, Karnataka by Raghavan et al<sup>22</sup>.

Of the 17 species, 3 species were found in fast water habitat, 3 in riffle, 6 in shallow water and 5 in slow water habitat, as shown in figure 1. This indicates that fishes in the study area are more common in shallow water habitats in comparison with other habitats. This could be due to the habitat itself, as it could be favourable for fish.

Although previous studies may imply that the fish fauna of the Western Ghats are threatened by introduced alien species<sup>22-26,28</sup> such introduced fish were not seen during this particular study.

## Conclusion

There is prolific diversity of ornamental fish in *Adda Hole* which is not much threatened by anthropogenic activities. Similar results were observed by Jadhav et al<sup>27</sup> in Koyna River, Northern Western Ghats. There is a possible threat to the area due to the construction of Mini Hydel power project at *Gundia*<sup>10</sup>. The surrounding undisturbed area is vitally important in maintaining fish stock. Any effort towards conservation must ensure that the status quo of fish fauna is maintained by

minimizing anthropogenic impacts and by not allowing any “developmental activities” in the area.

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