

A record of Tricolour Sharkminnow from southern India: an addition to the introduced fish fauna of the river Cauvery.

The proliferation of exotic or introduced species is a major global problem. This problem is further complicated in freshwater habitats, where the scale of fish invasions and their impacts are hard to track, due to practical difficulties in monitoring fishes. Fishes get introduced intentionally or accidentally via various methods such as commercial aquaculture, release of ornamental species, bioremediation and sometimes through live release from traditional religious practices (Everard et al. 2019). Approximately 5,300 species of freshwater fish (Novák et al. 2020) and 1,802 species of marine fishes are traded



Tricolor Sharkminnow captured on rod and line at the Malligemaradahalla Lake, Malavalli. The specimen was healthy with no physical deformities. © Ranjeet Singh.



Habitat where the specimen was captured. © Bradley N. Demos

internationally as ornamentals alone (Hensen et al. 2010; Rhyne et al. 2012), making up one-third of the top 100 global invasive species (Knight 2010). In India, the ornamental fish trade is a big business, and the risk of a wide variety of fish escaping into natural water bodies is high. Such intentional or unintentional introductions can lead to the proliferation of non-native species in natural waterbodies.

Direct impacts of alien invasive species include competition for food and territory with native fishes, increased predation pressures in the case of predatory species, introduction of parasitic invertebrates, genetic erosion of indigenous species and socio-economic impacts on fisher communities (Kumar 2000).

So far, not much attention has been given to monitoring fish invasions in the Cauvery River although literature suggests that 17 introduced fish species occur here. This number is likely to be much higher given the lack of literature available on the subject and limitations in field identification of fish. The handful of studies that are available, suggest that 11 of these species occur in the middle reaches of the river (Muralidharan et al. 2016; Sreenivasan et al. 2021).

In the Shivanasamudram Fish Sanctuary and the Cauvery Wildlife Sanctuary, these account for 17% of the documented species. Other studies in the lower reaches of the river report the presence of the Giant Gourami *Osphronemus goramy* and Mosquito Fish *Gambusia affinis*, that were

introduced to the Stanley Reservoir in the 1940's (Chacko et al. 1955). The Three-spot Cichlid *Amphilophus trimaculatus* (Kumar et al. 2021) and Dwarf Gourami *Trichogaster lalius* (Ramya et al. 2019) are two other species that have been reported from the lower reaches of the Cauvery. The African Sharptooth Catfish *Clarias gariepinus*, the world's most successful aquatic invader (Booth et al. 2010), is now widely distributed in the Cauvery system. Perhaps the most profound socio-economic impact of this invasive species is felt by fishermen who complain that their previous species-rich catch is now mostly comprised of *C. gariepinus*. Another invasive species, Nile Tilapia *Oreochromis niloticus* are found along the entire length of the Cauvery River. Their nesting pits are often visible along sandy banks as the river recedes. Then, there are the three Indian major Carps *Labeo catla*, *Labeo rohita* & *Cirrhinus mrigala*, Grass Carp *Ctenopharyngodon idella* and Common Carp *Cyprinus carpio* that are routinely stocked in the basin to support commercial fisheries. Below is an account of a new addition to the list of introduced species in the Cauvery River.

The Tricolour Sharkminnow *Balantiocheilos melanopterus* (Bleeker, 1850) is highly valued in the ornamental fish trade. The species is native to several countries including Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Thailand, and Vietnam (Acosta & Gupta 2005). However, a high demand for live caught specimens has led to the overharvest and subsequent extinction of

B. melanopterus from most of its distribution range (Baras et al. 2007). The species is commonly found in the world's aquarium market under the trade name, 'Bala shark' or 'Silver shark'.

On 12 October 2020, an adult specimen of *B. melanopterus* was captured at a recreational 'catch and release' fishery site near Shivanasamudram, Karnataka (12.3° N, 77.144° E). The collected specimen is likely to have escaped from aquaria or might have been intentionally released by a hobbyist. The fish was captured by a member of the Wildlife Association of south India, Mr. Ranjeet Singh while angling with a plant-based bait on a spring-feeder rig. The specimen measured 37.8 cm in standard length, it was photographed and released alive at the site of capture. The specimen was observed to be vigorous and healthy with no deformities. Angling guides working at the campsite for over 10 years, confirmed that they had not come across this species before.

It is important to monitor introduced species to understand patterns in their behaviour, distribution, and abundance. Apart from monitoring, there is also a need to carry out education programmes. Such campaigns will educate and sensitize hobbyists, anglers, or religious institutions to conservation issues. This current record of *B. melanopterus* from Cauvery, is a reminder for the need to employ strong legislations to regulate the import, propagation, and transport of non-native fishes in India. It also draws attention to the possibility of exploring the logistic potential

of angling community in the country to scientifically document fish diversity in a cost-effective manner. Given the right engagement between anglers, fishers, scientists, and conservationists, an opportunity to establish a citizen science platform could be explored to crowd source and manage data on the diversity and distribution of freshwater fishes in India.

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