



## Two non-native cichlid fish species from the natural waters of Chennai, India

Non-native fish are introduced throughout the world mainly for improving fisheries, sport, ornamental fish trade and bio-control of mosquitos (Bijukumar 2000). The aquarium trade has not come under the scanner of environmentalists, conservationists, ecologists, and policy makers as much as trade in terrestrial endangered species (Naylor *et al.* 2001, Chapman *et al.* 2003, Padilla & Williams 2004). The avenues from captivity to the wild include the dumping of unwanted fishes, escape from tanks and breeding farms perhaps during storms, and unchecked drainage of water containing organisms from tanks, and public aquaria (Padilla & Williams 2004). Such organisms are usually healthy adults, which have a greater probability of surviving and reproducing in the wild. Introduced aquarium fish represent a major source of ecological destruction that may be locally alarming if ignored (Liang *et al.* 2006).

The freshwater habitats of Chennai (Madras) and its environs have been surveyed extensively for the past 100 years (Raj 1916, Panikker & Aiyar 1937, Ganapati 1964, Evangeline 1967, Raghunathan 1978, Bai 1993, Rema Devi *et al.* 1999, Daniels & Rajagopal 2004, Raghunathan *et al.* 2005, Raghunathan *et al.* 2008, Knight & Rema Devi 2010, Knight & Balasubramanian 2015). Recent surveys by Knight (2010), Knight & Rema Devi (2010) and Knight & Balasubramanian (2015) have revealed that many alien species, now occur in the area, as a result of unmanaged aquaculture and/or the unregulated aquarium trade. The aquarium trade has already been responsible for the introduction of a few notorious alien invasive species into the natural waters of Chennai, such as the Loricariidae catfishes of the genus *Pterygoplichthys* Gill, 1858 (see Knight 2010, Knight & Rema Devi 2010), South American and African cichlids such as hybrids (Flower Horns) of *Amphilophus* sp. and *Hemichromis* sp. (see Knight & Rema Devi 2009, 2010, Knight

2010), as well as the South East Asian osphronemids, *Trichopodus trichopterus* (Pallas, 1770) (see Daniels & Rajagopal 2004, Knight 2010, Knight & Rema Devi 2010), *Trichopsis vittata* (Cuvier, 1831) and *Macropodus opercularis* (Linnaeus, 1758) (see Knight & Balasubramanian 2015).

Recently (April 2021) the first author noticed that two other cichlid species, which are popular in the aquarium trade, have naturalised in Reteri Lake, in Chennai, Tamil Nadu. The specimens were collected and identified as *Amphilophus labiatus* (Günther, 1864) commonly known as red devil cichlid and *Trichromis salvini* (Günther, 1862) commonly known as yellow belly cichlid. Specimens of *A. labiatus* were identified based on sharply indented cranial profile, moderate nuchal hump and heavily lobed lips with a distinct median knob present on the upper lip. The specimens also had a characteristic colouration with an orange-red body and some black piebald markings (Fig. 1A). *Trichromis salvini* was identified by the characteristic two dark lateral stripes on the upper portion of the body and dark, narrow bars or lines present, typically three or four, from in between the eyes to the predorsal region anterior to the dorsal fin (Fig. 1B). Both the species also fit with the diagnostic characteristics provided in Conkel (1993).

The impacts of these alien species in India have not been documented. However, *A. labiatus* is believed to be one of the most important threats to the native fish of Lake Sentani, Papua, Indonesia due to its ability to colonize new habitat and to successfully exploit a large diversity of trophic niches (Ohee *et al.* 2018). Recent studies (Raj *et al.* 2021) have demonstrated that unmanaged aquaculture and unregulated fisheries can often combine with extreme climatic events to exacerbate biological invasions through the unexpected introduction and escape of novel alien species. The impacts of these species are currently not well documented, as not many studies have been done to determine how they affect ecosystems

and other species. The absence of data does not equate to a lack of effects.

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## Plate 13

A



B



**Figure 1.** (A) *Amphilophus labiatus* (not collected) and (B) *Trichromis salvini* (not collected) observed at Reteri Lake, Chennai, India