

One more alien freshwater fish species in New Caledonia: the three-spot gourami *Trichogaster trichopterus* (Teleostei: Osphronemidae)

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Reporting the occurrences of non-native species established in a new territory is an important first step to thereafter evaluating both the spread of potential invaders and their consequences for native biodiversity. This is of particular relevance when the newly colonized areas are hotspots of biodiversity. Located in the southern Pacific, the hydrological drainages of the Grande-Terre

of New Caledonia (i.e. the main and largest island of the New Caledonia Archipelago, Fig. 1) are recognized as hosting a vast diversity of freshwater fish and crustacean species. Among the 104 recovered species (reviewed by MARQUET et al., 2003 (1)), around one quarter are endemic, with some of them having been very recently described (e.g., *Stiphodon mele* KEITH et al., 2009 (2)). These species sometimes co-exist with introduced taxa that pose a threat for their survival (3; 4). Here, we report the presence of an alien osphronemid fish species identified as

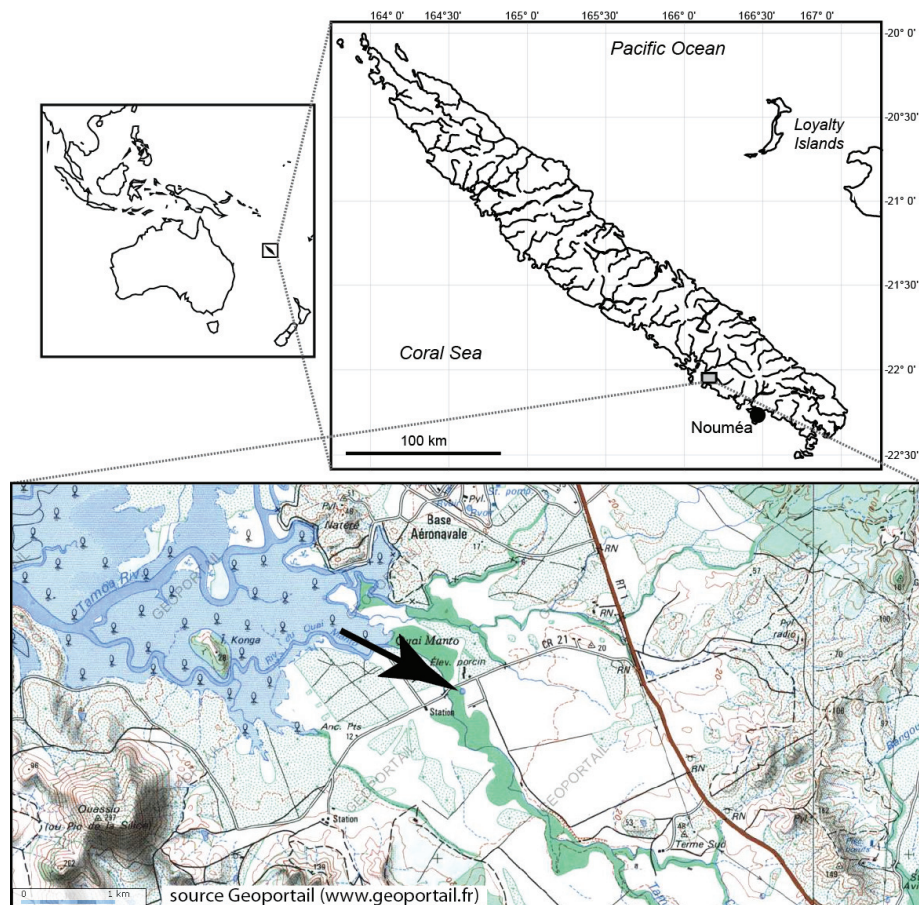


Fig. 1. – Geographic localization of New Caledonia and the pond hosting a population of *Trichogaster trichopterus*. The arrow points the exact location of the pond.

Trichogaster trichopterus (Pallas, 1770) for the first time in New Caledonia.

In two hours fishing effort by one of us (C.F.), 22 individuals were caught using a small-mesh cast-net in a freshwater pond located within the lower reach of the Tamoa drainage (Province Sud, coordinates: 166° 13' 1.77" E, 22° 2' 27.15" S; Fig. 1). These specimens were captured along with a second alien species, the Mozambique tilapia *Oreochromis mossambicus* (Peter, 1852) ($n=35$).

One representative specimen is depicted in Fig. 2. The taxonomic identification is based on descriptions of RAINBOTH (5). The captured specimens exhibit a dorsal fin anteriorly starting far behind the anal fin and a long filamentous pelvic fin. Together, these are characteristic features of the genus *Trichogaster*. The presence of two large dark spots on the side (one at the centre of the body and the other at the basis of the caudal peduncle) and of vertical bars on the anterior part allow us to unambiguously identify this species as the three-spot gourami *Trichogaster trichopterus*. This is further supported by comparisons with *T. trichopterus*

museum specimens hosted in the Bavarian State Collections of Zoology, Munich (ZSM) from Malaysia ($n=3$) and Borneo ($n=5$) which clearly exhibit similar gross morphologies.

Two other species of Osphronemidae have already been introduced in New Caledonia (1). While the giant gourami *Osphronemus gouramy* (Lacépède, 1801) is probably not established, populations of the snakeskin gourami *Trichogaster pectoralis* (Regan, 1910) were recently recovered in one drainage in the northern part of the island (1). Until now, there had been no report of the occurrence of *T. trichopterus* in New Caledonia (1; 4). *T. trichopterus* originates from the Mekong basin where it is found in sluggish or standing-water habitats. It is reported as 'established' (here synonym of 'naturalized', i.e. a species sustaining self-reproducing populations, see e.g. ref. (6)) out of its native range in Asia (Taiwan, Sri Lanka, Philippines), Oceania (Papua New Guinea), Africa (Namibia) and the New World (Columbia, Dominican Republic) (7). To our knowledge, the presence of *T. trichopterus* in New Caledonia is the second occurrence of this species in Oceania (after New Guinea), and the first clue for its spread south-eastward in the Pacific.

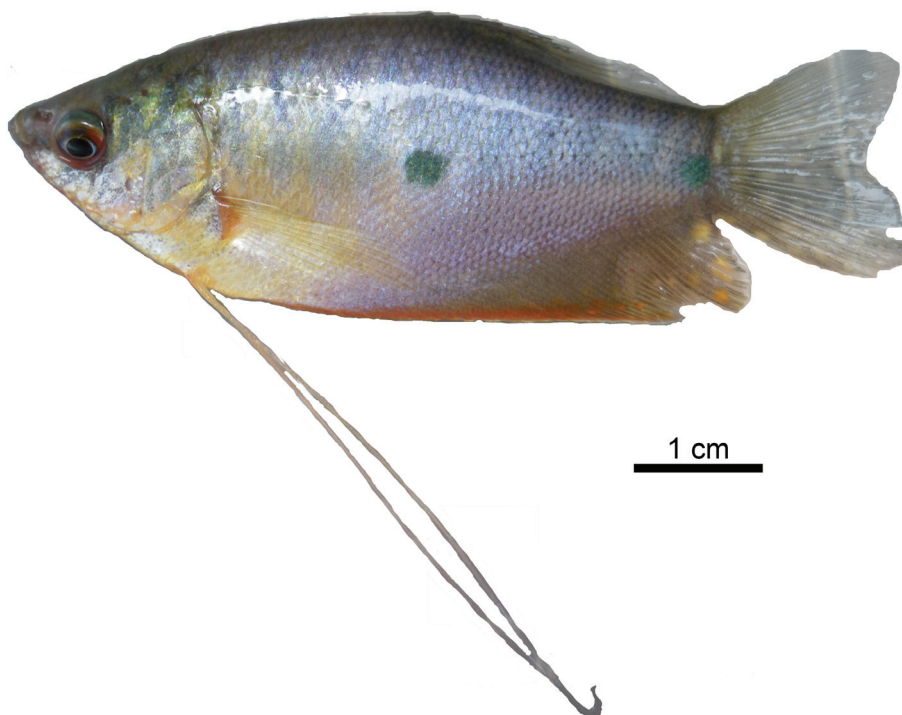


Fig. 2. – An adult specimen of *Trichogaster trichopterus* collected in New Caledonia.

T. trichopterus is widespread in aquarium fish trade and was probably transported to New Caledonia as an ornamental species and then released in the wild. The pond that provided specimens is connected with a tributary of the Tamoia River during the period of floods, suggesting that this species has already spread locally in the drainage. The relatively high number of captured specimens and the already-reported presence of naturalized populations out of the native range (7) suggest that *T. trichopterus* is probably also established in New Caledonia. If other specimens are found in neighbouring drainages, the species could thereafter be considered as established. At least two features of this species would favour its dispersal: (i) Its aesthetic qualities that could stimulate its capture and human-induced transfers as ornamental fish across New Caledonia (or on a larger scale) and (ii) its air-breathing capacity (8), which could favour its survival in eutrophic ponds or swamps before its natural dispersal during flood periods.

T. trichopterus individuals mainly feed on crustaceans, zooplankton and insect larvae (5). At the present time, potential impacts on aquatic invertebrate communities are difficult to evaluate but a potential negative effect can be hypothesized and could be investigated (e.g. through analyses of stomach contents). According to the recent survey of KEITH (4), *T. trichopterus* is the 14th freshwater fish species introduced in New Caledonia and could be the 7th one to become established. Estimating its actual repartition, alerting the public to its presence and its potential negative impacts and encouraging people to remove and kill encountered specimens could represent first steps to management of this new alien species.

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