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Distributions of a Natural Coloniser and an Established Exotic Fish Species: *Gephyrocharax valencia* (Characiformes: Characidae) and *Trichogaster trichopterus* (Perciformes: Osphronemidae) in Trinidad

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Distributions of a Natural Coloniser and an Established Exotic Fish Species: *Gephyrocharax valencia* (Characiformes: Characidae) and *Trichogaster trichopterus* (Perciformes: Osphronemidae) in Trinidad

The freshwater ichthyofaunal assemblage of Trinidad is dynamic, and our understanding of it is affected by changes in taxonomy and new findings. Phillip and Ramnarine (2001) listed 41 species of freshwater fish within Trinidad and Tobago, with no species unique to Tobago. Since then there have been three additions to the freshwater fish checklist, bringing the species richness up to 44. These three additions were the Three spot gourami, *Trichogaster trichopterus,* at one site in the Oropouche Drainage (Mohammed *et al.* 2010), the Driftwood catfish, *Trachelyopterus galeatus,* in the Caroni and Guayamare Rivers (Mohammed and Lalla 2013), and the characin, *Gephyrocharax valencia,* localised in the Moriquite and Moruga Rivers (Vanegas and Phillip 2013). The three species we examined here were chosen because they are the most recent additions to the fish assemblage and because they are important as a result of their potential ecological impacts.

Kenny (1995) suggested that there were five zones within Trinidad, each with a characteristic freshwater ichthyofaunal assemblage. These included Antillean Zone (north coast), Unstable Relic Zone (southern slope of Northern Range), Stable Relic Zone (majority of which are in the central region), Eastern Colonising or Relic Zone (east coast including Nariva and Ortoire, overlapping into the Stable Relic region of Valencia), and lastly the Colonising Zone (south coast). Vanegas and Phillip (2013) supported Kenny's (1995) claims that the southern regions of Trinidad are "colonising zones" for fish, particularly during periods of heavy discharges of the Orinoco River into the Columbus Channel. Evidence for this included the fact that *G. valencia* was restricted to the freshwater reaches of the Moriquite and Moruga Rivers, which are both located in the south of the country, as well as being found throughout the northern coastal regions of Venezuela.

Repeated sampling by use of river seines and cast netting at more than 100 sites in southern Trinidad over the last five years has allowed us to learn more about these three additions to the checklist. Identifications were confirmed by use of taxonomic keys from Phillip *et al.* (2013).

These identifications have allowed for an increase in the knowledge of distributions of *G. valencia* and *T. trichopterus*. No changes were observed in the distribution of *T. galeatus.* This does not necessarily mean that the ranges of the former two species are expanding, as these new regions of occurrence could potentially be due to lack of monitoring in the past. Figure 1 illustrates the current and previous regions within which *T. trichopterus* and *G. valencia* have been detected, accompanied by Table 1, which gives the GPS coordinates (20P, UTM).

Ornamental strains of *T. trichopterus* that differ from the original wild strains were introduced to the Oropouche Drainage, and this exotic species has since established there. The individuals now being caught closely resemble the wild strain found in the Cambodian Mekong where they originated (Mohammed *et al*. 2010), which indicates that the strain has reverted to the wild type.

Shoals of *G. valencia* usually were found together with other characin species such as *Corynopoma riisei* and *Astyanax bimaculatus.* The general regions in which these were found were mostly within ephemeral drainages along the Penal Rock Road (eastern end) as well as at the original sites of the first records by Vanegas and Phillip (2013). The shoals were found clustered in pools along the rivers during the late rainy season (November 2014). Formation of such mixed shoals would increase survival of all species from piscivorous predators (Ward *et al.* 2002).

In contrast, *T. trichopterus* has established mono-species populations among the shallow lagoons near Ramsingh Trace west of Rochard Road as well as near to Nagesar Trace south of the Penal Rock Road (western end). Being an anabantid species, it is well adapted to low dissolved oxygen concentrations and has the potential of establishing itself rapidly in stagnant waters (Knight 2010; Mohammed *et al.* 2010). Capitalising on this, *T. trichopterus* has displaced several native characins from the lagoons (anecdotal evidence and pers. comm. with several subsistence fish collectors). It is safe to say that this exotic fish has established breeding populations within the Oropouche Basin.

Internationally, *T. trichopterus* also has established populations in parts of India such as Chennai (Daniels and Rajagopal 2004; Daniels 2006) and Vembanad Lake in Kerala (Krishnakumar *et al.* 2009). There is a dearth of information on its ecological impacts in these regions of introduction. However, *T. trichopterus* is considered a territorial and aggressive opportunistic carnivore. In Taiwan it is suspected to be a resource competitor with the endangered Chinese Barb (*Puntius semifasciolata*), causing a decline in populations of that species (Liao and Liu 1989).

Kenny (1995) suggested that the drainage systems of south Trinidad may be a colonising zone for new species of fish from the South American mainland. Our findings support this theory, particularly the presence of *G. valencia*. Whilst *T. trichopterus* and *T. galeatus* are introduced

Table 1. Historical and current distribution of *Trichogaster trichopterus* and *Gephyrocharax valencia.*

Species	Year	Eastings	Northings
Trichogaster trichopterus	2010	667160	1127058
	2012	678626	1128880
	2014	671819	1120567
		673037	1121860
		672763	1121881
		673315	1122197
		673473	1121879
Gephyrocharax valencia	2012	690946	1120488
		686888	1118540
	2014	687659	1127013
		685925	1127135
		685503	1122249
		691065	1120680
		685306	1115005
		685432	1120061
		684705	1120096
		681226	1121503
		679898	1121754

species from Asia and South America, respectively, this new information will contribute towards increased knowledge of freshwater fish distributions within Trinidad.

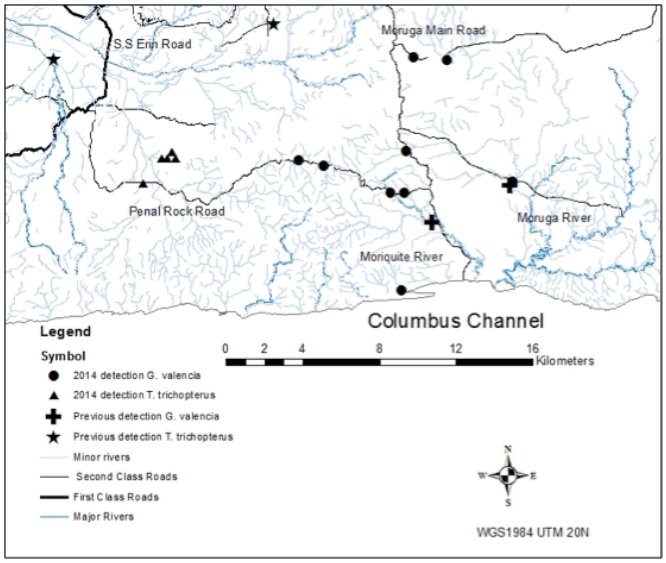

Fig. 1. Distribution of *Trichogaster trichopterus* and *Gephyrocharax valencia.*

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