

Original Article

Extended distribution of the invasive Sucker catfish *Pterygoplichthys pardalis* (Pisces: Loricariidae) to Cauvery river system of Peninsular India

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Abstract: This report provides the first record of the exotic sucker fish *P. pardalis* from the Cauvery River system, Tamilnadu State, India. Information on the assumed presence of this invasive species based on sightings of a hitherto unknown species by local people and fishermen in stretches of Cauvery River has been confirmed by our study. Sailfin sucker fishes are popular among pet traders and aquarists in southeast Asian countries and have been regarded as invaders worldwide. Occurrence of *P. pardalis* in newer habitats due to its potential invasion in the South Indian waters issues threat to native fauna.

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Introduction

Invasion of aquatic systems by exotic fishes, widely recognized as the consequence of human mediated environmental intervention, has become the prominent threat to biodiversity in the recent years. Aquaculture and aquariums are responsible for introduction of ornamental and economically important fish species to newer environments (Chavez et al., 2006). The family Loricariidae includes catfish generally referred to as “Plecs” that are widespread throughout South America. Though the majority of the species available are from wild, these are also being bred through commercial breeding farms for the aquarium trade. As the reason they are often hybridized among stocks for better varieties, hence, the identity of individual species is always uncertain (Wu et al., 2011).

Pterygoplichthys pardalis, suckermouth armored catfish of the family Loricariidae is native to Tropical America, occurring in the lower, middle and upper Amazon River basin of Brazil and Peru

(Weber, 2003; Page and Robins, 2006). This species is characterized by bony plates covering the body, a pair of subterminal barbels, sucking lips, usually a spine in front of the adipose fin, a flat-bottom body (Page and Burr, 1991) and uncoalesced dark spots on a light background (Page and Robins, 2006). Being voracious algal feeders, the introduction of this species was solely for the aquaria. Species of *Pterygoplichthys* are widespread invasive fish known from many areas outside their native ranges, including Hawaii, Mexico, Puerto Rico and the continental United States (Ludlow and Walsh, 1991; Page and Burr, 1991; Bunkley-Williams et al., 1994; Chavez et al., 2006). Species of this genus have been recorded from several Southeast Asian countries, including Singapore, Malaysian Peninsula, Java, Sumatra, Vietnam and Taiwan (Liang et al., 2005; Page and Robins, 2006; Levin et al., 2008), Bangladesh (Hossain et al., 2008) and India (Daniels, 2006; Krishnakumar et al., 2009; Knight, 2010; Sinha et al., 2010). In addition, *P. pardalis* has

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Figure 1. Dorsal and ventral view of *P. pardalis* collected from Cauvery River, India.

been recorded from Lake Matano, Sulawesi, Indonesia (Herder et al., 2012), Malaysian Peninsula (Samat et al., 2008), Philippines (Chavez et al., 2006) and Sri Lanka (Sumanasinghe and Amarasinghe, 2013). Further, it has been regularly bred and exported from Singapore. *Pterygoplichthys pardalis* and *P. multiradiatus* are among the most popular and intensively marketed varieties of tropical aquarium fish species in South India (Knight, 2010).

The ecological impacts upon introduction of this species to the aquatic habitat are disruption of food chain by overgrazing of benthic algae (Liang et al., 2005; Chavez et al., 2006), competing with native species (Nico and Martin, 2001), modifying substrates and disrupting benthic communities (Hoover et al., 2004) and damaging the banks by burrowing (Bunkley-Williams et al., 1994). Information on the new ranges occupied and extension in distribution range would enable effective management. Herein, we report the occurrence of *P. pardalis* in Cauvery River of Peninsular India.

Materials and methods

Fish collection was accomplished with cast nets. Specimens were preserved in 10% buffered formalin and stored at Sri Paramakalyani Centre for

Environmental Sciences, Manonmaniam Sundaranar University, Alwarkurichi. Meristic characters and morphometric measurements were carried out following the methods of Armbruster (2003). Measurements were taken with digital slide calipers up to the nearest 0.1 mm and expressed as percentage of standard length. Other external features and coloration were also examined. Abbreviations of meristic counts: D - Dorsal, A - Anal, P - Pectoral, V - Ventral, C - Caudal, L.L - Lateral line scales.

Results

Eight specimens of *P. pardalis* (Fig. 1) were collected from Cauvery River (11°02'10.4"N, 78°08'45.2"E) at Mohanur (Fig. 2), Namakkal district, Tamilnadu on 24 October 2013. *Pterygoplichthys pardalis* is diagnosed by discrete dark spots on the lateral and caudal peduncle with a pattern of uncoalesced dark spots on a light background, stout pectoral fins with rough surfaces and inferior disc-like protrusible mouth. Fin ray counts for the fishes are D: I 12, A: I 4; P: I 6; V: I 5; C: 14; L.L: 26-32. Morphometric details of the samples as provided in Table 1. Body behind head completely plated dorsally and laterally. Belly naked, with the plates occurring on the ventral side of the body only at the caudal peduncle region.

Table 1. Morphometric measurements of *P. pardalis* collected from Cauvery River, India.

Measurements	Range	Mean	S.D.
Total Length (mm)	142.5 - 189.1	163.91	12.8
Standard Length (mm)	107.3 - 138.4	125.38	10.0
Expressed as %SL			
Predorsal Length	40.07 - 45.90	42.36	2.1
Head Length	22.46 - 27.03	24.50	1.6
Snout Length	10.55 - 14.42	12.23	1.3
Mouth Length	9.45 - 13.40	11.56	1.4
Barbel Length	4.03 - 6.50	5.10	0.8
Pectoral Spine Length	28.13 - 31.48	29.01	1.0
Pelvic Spine Length	17.61 - 23.62	20.25	1.8
Anal Fin Spine Length	11.62 - 15.46	13.49	1.8
Dorsal Spine Length	25.79 - 32.14	28.33	2.0
Dorsal fin base length	36.41 - 39.29	38.23	1.0
Caudal Peduncle depth	9.10 - 11.42	9.97	0.9
Head depth	12.46 - 17.36	15.29	1.7
Mouth width	10.63 - 13.22	12.01	0.8
Orbit diameter	2.17 - 3.52	3.01	0.3
Pre adipose length	83.72 - 90.34	86.87	2.5



Figure 2. Distribution of the genus *Pterygoplichthys* in South India. Collection site of *P. pardalis* (Red star). Previous records of *P. multiradiatus* (Black star).

Ventral surface of the pectoral girdle covered in skin mesial to the coracoid strut. Caudal peduncle round in cross section. Adipose fin present in the peduncle region. Edge of snout covered with plates. Postdorsal ridge inconspicuous, with the single, median, unpaired preadipose plate. Body coloration, particularly on the abdomen, consists of dark spots

on light background, however head exhibit linear patterns forming geometric shapes. Most of the samples have a base color of light gray usually becoming lighter towards the ventral side. This is the first report of *Pterygoplichthys pardalis* in a South Indian river system.

Discussion

In Southern India, *P. multiradiatus* another species of the genus has been reported from Vylathur and the Chackai Canal Kerala (Daniels 2006; Krishnakumar et al., 2009) and wetlands of Chennai, Tamilnadu (Knight, 2010). Being a generalist with a wide spectrum of food, this opportunistic invader could be a threat to native species. It is hence regarded as potential threat to native fish diversity in Western Ghats (Molur et al., 2011). Occurrence of *P. pardalis* in open waters of peninsular India is concerning in terms of the mounting pressure on the already dwindling indigenous fishes. Distribution of *Pterygoplichthys* species along the stretches of the Cauvery River basin may be expected as there are few news reports on the occurrence of this species in Mettur reservoir and of being caught in the

downstream river. The reason for successful expansion and establishment could be due to the suitable habitat for feeding and nesting and the polluted segments with fewer disturbances from humans.

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