

## IDENTIFICATION OF SAILFIN CATFISHES (TELEOSTEI: LORICARIIDAE) IN SOUTHEASTERN ASIA

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**Abstract.** – Three species of sailfin catfishes (*Pterygoplichthys*) native to South America, *P. multiradiatus*, *P. pardalis* and *P. disjunctivus*, have been collected recently in several countries in southeastern Asia. *Pterygoplichthys multiradiatus* is known to reproduce in Taiwan, and *P. pardalis* is presumed to be reproducing in Singapore given the frequency of its collection and the range in size of specimens collected. The status of the species elsewhere in southeastern Asia is less certain. These catfishes are common in the pet trade and almost certainly were released by aquarists. It is likely that these fishes will become widely established in southeastern Asia and will have negative environmental impacts, including alteration of food webs, in non-native areas.

**Key Words.** – *Pterygoplichthys*, exotic species.

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### INTRODUCTION

*Pterygoplichthys multiradiatus* is established in the Kaoping River in southern Taiwan (Liang et al., 2005), and Kottelat et al. (1993) tentatively identified sailfin catfishes found in Indonesia as *Pterygoplichthys pardalis*. Specimens in the Zoological Reference Collection, Raffles Museum of Biodiversity Research (ZRC), and the Florida Museum of Natural History (UF) document the presence of *Pterygoplichthys pardalis* in Singapore, Peninsular Malaysia, Java and Sumatra, and *Pterygoplichthys disjunctivus* in Singapore, Java and Taiwan (see Material Examined).

With about 80 genera and 680 species (Reis et al., 2003), Loricariidae is the largest family of catfishes (Siluriformes). Loricariids are endemic to South America and Panama and are characterized by having large bony plates and a ventral mouth. Loricariids with 10 or more dorsal fin rays are members of the genus *Pterygoplichthys* and are referred to as sailfin catfishes. All specimens of *Pterygoplichthys* from southeastern Asia lack an elevated supraoccipital process and have the supraoccipital bone bordered posteriorly by three scutes. A group of four closely related species of *Pterygoplichthys* share these traits (Weber, 1991, 1992): *P. multiradiatus*, *P. anisitsi*, *P. disjunctivus*, and *P. pardalis*. Among these species, only *P. anisitsi* has light spots on a dark background, and only *P. multiradiatus* has a pattern of

uncoalesced dark spots on a light background. *Pterygoplichthys disjunctivus* and *P. pardalis* possess a dorsal pattern of coalesced dark spots on a light background. *Pterygoplichthys disjunctivus* differs from *P. pardalis* in having dark spots on the venter coalesced to form a vermiculate pattern (Fig. 1); in *P. pardalis* the venter is covered with discrete spots (Fig. 2). Specimens at ZRC and UF are easily identified as *P. pardalis* and *P. disjunctivus*.

*Pterygoplichthys pardalis* occurs naturally in the lower, middle and upper Amazon River basin of Brazil and Peru (Weber, 2003). *Pterygoplichthys disjunctivus* is native to the Rio Madeira drainage of Brazil and Bolivia. English common names are Amazon Sailfin Catfish for *P. pardalis* (see Nelson et al., 2004) and Vermiculated Sailfin Catfish for *P. disjunctivus* (see Page, 1994). Both species are common in the tropical fish trade and almost certainly were released into Asian water bodies by aquarists.

Species of *Pterygoplichthys* are widespread invasives known from many areas outside their native ranges, including at least Hawaii, Mexico, Puerto Rico and the continental United States (Bunkley-Williams et al., 1994; Guzmán & Barragán, 1997; Fuller et al., 1999; Edwards, 2001; Nico & Martin, 2001) in addition to Indonesia, Malaysia, Singapore and Taiwan. In all instances, the presumed mechanism of introduction was aquarium release or escape from aquaculture farms.

Deleterious environmental effects recorded in association with the introduction of *Pterygoplichthys* are classifiable as environmental degradation or ecological disruption. In Hawaii, the burrowing and tunneling activities of adult male *P. multiradiatus* have caused siltation problems in reservoirs and streams (Devick, 1989). In Puerto Rico, endangered Brown Pelicans (*Pelecanus occidentalis*) were observed to have strangled while trying to consume specimens of *P. multiradiatus* (Bunkley-Williams et al., 1994). *Pterygoplichthys* species in Florida are thought to be competing with native fishes for resources and may be altering food web dynamics (Nico & Martin, 2001).

It is likely that species of *Pterygoplichthys* will become widely established in southeastern Asia and will have negative impacts on native species. The most likely impact is alteration of food web dynamics, as predicted in Florida by Nico & Martin (2001). *Pterygoplichthys* species are herbivores, and large populations can significantly alter the ecology of a water body by reducing the amount of energy available to other herbivores such as aquatic insects and other arthropods. Reductions in populations of arthropods will lead to reduced populations of other animals that feed on arthropods, including many native fishes of southeastern Asia (Inger & Chin, 2002; Kottelat et al., 1993).

#### MATERIAL EXAMINED

*Pterygoplichthys pardalis*: Singapore: Ulu Sembawang (3 ex., ZRC 22494-22496, Apr.1992), Choa Chu Kang fish ponds (2 ex., ZRC 13558 & UF 146785, 1990), stream in rural Mandai (1 ex., ZRC 11650, 1988), Singapore – no precise locality (6 ex., ZRC 11687-11689, 11691-11692; UF 146784,

1989); Malaysia: Johor, Sungai Machap, (1 ex., ZRC 19412, 18 Aug.1991); Indonesia, Java: Banjar market (1 ex., ZRC 44093, 27 Jun.1997), Kampung Patro (5 ex., ZRC 43860, 1 Jul.1997), Citalahab (3 ex., ZRC 43879, 26 Jun.1997); Indonesia, Sumatra: Medan, Sungai Deli (4 ex., ZRC 42466, 14 Jun.1996).

*Pterygoplichthys disjunctivus*: Singapore: Choa Chu Kang fish ponds (1 ex., ZRC 13557, 1990), stream in rural Mandai (1 ex., ZRC 11650, 1988); Indonesia, Java: Banjar market (1 ex., ZRC 44093, 27 Jun.1997); Taiwan: Pingtung County, Gaoping basin (1 ex., ZRC 46820, 30 Nov.2001).

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Fig. 1. Underside of *Pterygoplichthys disjunctivus* (ZRC 13557; 259.7-mm SL), Choa Chu Kang Fish Ponds, Singapore, 1990. Note the pattern of dark vermiculations on a light background.



Fig. 2. Underside of *Pterygoplichthys pardalis* (ZRC 11689; 112.1-mm SL), Singapore, 1989. Note the pattern of unconnected dark spots on a light background.

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