

THE STATUS OF THE CATFISH *MYSTUS WOLFFII* BLEEKER, 1851 (ACTINOPTERYGII: SILURIFORMES: BAGRIDE) IN SINGAPORE, WITH NOTES ON ITS TAXONOMY

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ABSTRACT. — The status of the bagrid catfish *Mystus wolffii* Bleeker, 1851 as a non-native species in Singapore is reassessed in this study. Evidence is presented here to suggest that *Mystus wolffii* is native to Singapore. The taxonomic status of *Mystus armiger*, here considered a junior subjective synonym of *Mystus wolffii*, is also clarified in this study.

INTRODUCTION

The bagrid catfish *Mystus wolffii* Bleeker, 1851 was recorded from Singapore for the first time by Ng & Tan (2010) as an alien species, a conclusion made primarily on the basis of the absence of this species in previous surveys of the ichthyofauna of Singapore. Since then, additional material has been obtained from Singapore; this additional material, together with what we understand of the biology of the catfish, suggests that *Mystus wolffii* may in fact be native to Singapore. The purpose of this study is to reassess the status of *Mystus wolffii* as a species alien to Singapore, as well as to provide notes on the taxonomy of this species.

MATERIAL AND METHODS

Measurements were made point to point with dial calipers and data recorded to tenths of a millimeter. Counts and measurements were made on the left side of specimens whenever possible. Subunits of the head are presented as proportions of head length (HL). Head length and measurements of body parts are given as proportions of standard length (SL). Measurements follow those of Ng & Dodson (1999). Institutional abbreviations follow Ferraris (2007).

RESULTS

A total of 17 specimens of *Mystus wolffii* from freshwater and coastal habitats of Singapore was examined. An additional 26 specimens from similar habitats in Borneo and the Malay Peninsula were also examined.

Mystus wolffii (Bleeker)

Fig. 1

Bagrus wolffii Bleeker, 1851: 205 (type locality: Banjarmasin, Borneo)

Mystus armiger Ng, 2004: 883, Figs. 1–3 (type locality: Kelantan River at Kampung Kuala Besar, 200 m from the sea, Kelantan, Malaysia)

Material examined. — SINGAPORE: ZRC 53387, 2 ex., 135.1–141.0 mm SL; Sungei Buloh at sluice gate near bridge. ZRC 53260, 2 ex., 59.2–61.2 mm SL; Punggol Reservoir, Seletar Wet Gap. ZRC 51208, 1 ex., 161.3 mm SL; Upper Seletar Reservoir. ZRC 51021, 1 ex., 180.8 mm SL; ZRC 51166, 1 ex., 172.6 mm SL; Upper Peirce Reservoir. ZRC 52065, 1 ex., 181.9 mm SL; drain from conduit between Upper Seletar and Lower Peirce reservoir. ZRC 51126, 6 ex., 163.4–174.4 mm SL; ZRC 53390, 2 ex., 144.4–160.8 mm SL; Lower Peirce Reservoir. ZRC 50978, 1 ex., 141.1 mm SL; Tengeh Reservoir. BORNEO: RMNH 6866, holotype, 101.0 mm SL; Borneo: Banjarmasin. ZRC 41847, 3 ex., 138.9–143.9 mm SL; Sarawak: Serian market, from Sungai Sadong. PENINSULAR MALAYSIA: CAS 218896, holotype of *Mystus armiger*, 107.9 mm SL; CAS 65248, 9 paratypes of *Mystus armiger*, 79.5–155.5 mm SL; Malaysia: Kelantan, Kelantan River at Kampung Kuala Besar, 200 m from the sea. ZRC 49149, 3 ex., 105.9–130.4 mm SL; Selangor: Kuala Selangor. ZRC 24770, 1 ex., 145.8 mm SL; Johor: Muar River at Kampung Bukit Kepong. ZRC 40494, 1 ex., 129.5 mm SL; Johor: Muar, Tanjung Olak, 5–6 km from Bukit Pasir. THAILAND: CAS 55554, 7 ex., 103.7–133.0 mm SL; Songkhla Province: brackish lagoon channel parallel to sand bar of Songkhla Channel, near gulf entrance.



Fig. 1. *Mystus wolffii*, ZRC 53260, 61.2 mm SL; Singapore: Punggol Reservoir. (Photograph by: Kelvin Lim).

Diagnosis. — *Mystus wolffii* is easily distinguished from Southeast Asian *Mystus* species by the combination of extremely long maxillary barbels (reaching to or beyond the middle of the anal-fin base), a relatively short adipose-fin base (12–15% SL) that is approximately as long as the anal-fin base and a uniformly gray body devoid of any other markings.

Distribution. — This species is known from the lower reaches and estuaries of river drainages in the Malay Peninsula as far north as Lake Songkhla, Singapore, southern Sumatra, western and southern Borneo (Fig. 2). In Singapore, this species is known from the Lower Peirce, Lower Seletar, Murai, Punggol, Tengeh, Upper Peirce, and Upper Seletar reservoirs, and Sungei Buloh. Records of this species from the Mekong River drainage (e.g., Rainboth, 1996) refer to a similar-looking, undescribed species.

Remarks. — A detailed re-examination of the type material of *Mystus wolffii* and *Mystus armiger* reveals no significant differences between the two. On this basis, they are regarded as conspecific in this article. *Mystus wolffii* is found syntopically in Singapore with *Mystus gulio*, which it superficially resembles. The two species can be distinguished by the length of the maxillary barbels (reaching beyond the anal-fin origin and frequently to the base of caudal fin in *Mystus wolffii*, versus reaching between pelvic- and anal-fin bases in *Mystus gulio*), the extent of the cranial fontanel (reaching the base of the supraoccipital spine in *Mystus wolffii*, versus not reaching in *Mystus gulio*), and the shape of the adipose fin (without a deeply incised posterior margin in *Mystus wolffii*, versus with a deeply incised posterior margin in *Mystus gulio*; Fig. 3).

DISCUSSION

Mystus wolffii was regarded as a species alien to Singapore by Ng & Tan (2010), citing the absence of this species from earlier surveys of Singapore's freshwater ichthyofauna. Additionally, this species was only recorded from freshwater reservoirs of Singapore. Their conclusion was further supported by the fact that the lentic habitats of Singapore's reservoirs are not naturally-occurring ecosystems that possess a preponderance of alien freshwater species (Ng & Tan, 2010; Yeo, 2010). However, surveys from other parts of Sundaic Southeast Asia (most notably in Thailand and northern Peninsular Malaysia) indicate that *Mystus wolffii* is not restricted to freshwater habitats, but also lives in brackish and shallow inshore marine habitats. Even so, *Mystus wolffii* is very infrequently encountered during ichthyological surveys of the lower reaches and estuaries of the river drainages it is known to naturally occur. For instance, numerous surveys of the lower Kapuas River drainage in western Borneo (Imaki et al., 1981; Roberts, 1989) have failed to encounter this species, and *Mystus wolffii* has not been found in the lower Kapuas River drainage since Bleeker (1858) first recorded this species from there.

Given that *Mystus wolffii* is known from areas surrounding Singapore (Fig. 2), the fact that this species is very infrequently encountered in ichthyological surveys, and that this species occurs in estuarine habitats (Sungei Buloh) in Singapore makes it much more plausible that *Mystus wolffii* is native to Singapore and has been overlooked in previous surveys. As further support, it is worth noting that this species has been found in the Muar River, Johor (albeit in freshwater habitats), only about 150 km northwest of Singapore.

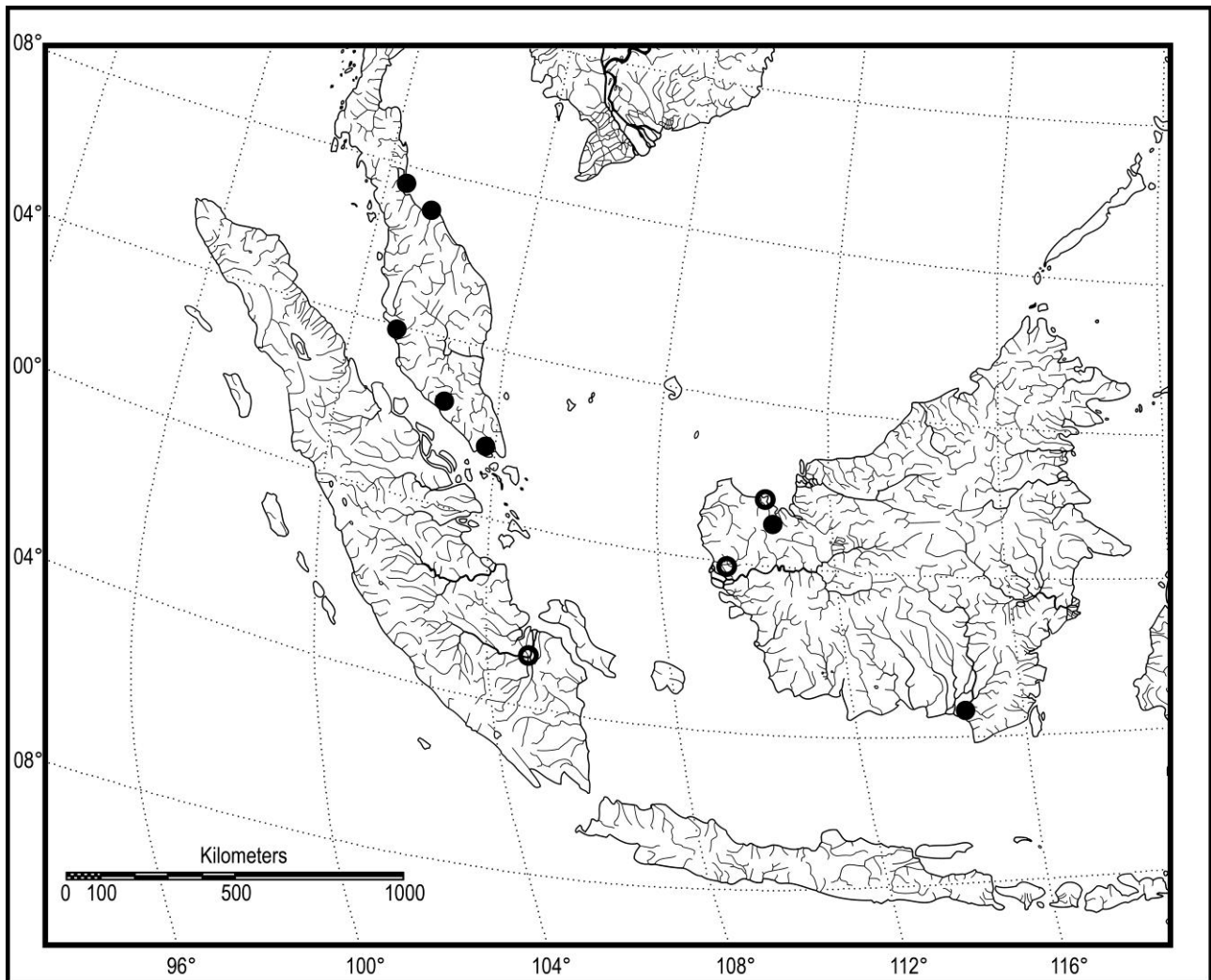


Fig. 2. Map showing distribution of *Mystus wolffii*. Closed circles represent records based on specimens, while open circles indicate records from the literature.

The presence of *Mystus wolffii* in estuarine habitats may explain the occurrence of this species in some of the reservoirs of Singapore (Lower Seletar, Murai, Punggol, and Tengeh), which were formed by the impoundment of river mouths. It is unusual to note that *Mystus wolffii* has not been recorded previously in ichthyofaunal surveys of Singapore (e.g. Alfred, 1966), which had led to the hypothesis that this species is not native. However, the fish fauna of estuarine habitats in Singapore have not been comprehensively surveyed, and it is very likely that this species (which is apparently not commonly encountered in many estuarine habitats even in other areas of its geographic distribution) could have been overlooked.

The populations of *Mystus wolffii* in the Central Catchment (Upper and Lower Peirce, Upper Seletar) reservoirs are still likely to be non-native, as the portions of Kallang (Upper and Lower Peirce reservoirs) and Seletar (Upper Seletar Reservoir) rivers that were dammed to form the reservoirs were not estuarine, and thus unlikely for *Mystus wolffii* to be found there pre-impoundment. As pointed out by Ng & Tan (2010), the catfish might have been introduced via raw water pumped from the Tebrau River in Johor (which is discharged via an outlet in the Upper Peirce Reservoir). As raw water is transported among the three reservoirs through either direct connections (Upper and Lower Peirce reservoirs) or conduits (Upper Seletar and Lower Peirce reservoirs), this makes it easy for the catfish to move within the three reservoirs.

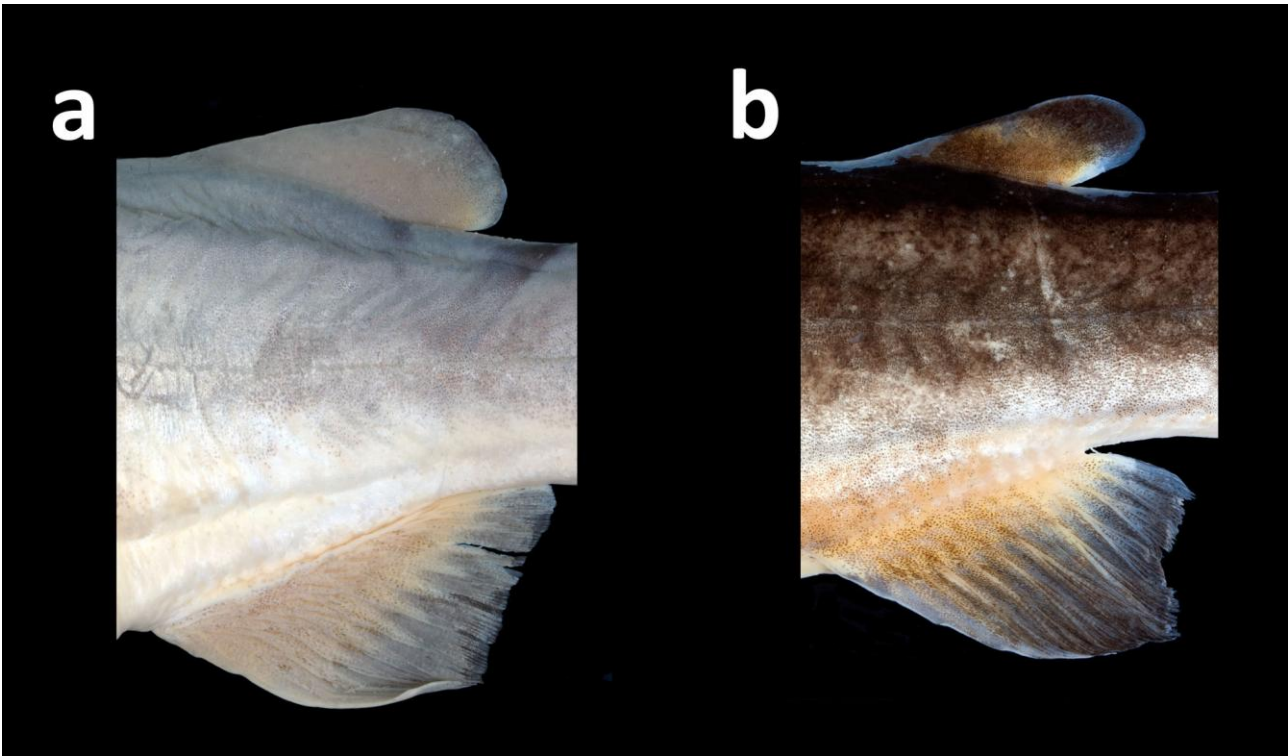


Fig. 3. Adipose fins of: a, *Mystus wolffii*, ZRC 53387, 141.0 mm SL; b, *M. gulio*, ZRC 52087, 157.4 mm SL, to show differences in shape. Figures are not to scale.

COMPARATIVE MATERIAL

Mystus gulio: ZRC 784, 27 ex., 52.2–132.3 mm SL; Singapore: Sungei Poyan. ZRC 1152, 1 ex., 100.0 mm SL; ZRC 2427, 1 ex., 72.7 mm SL; Singapore: Sungei Tengeh. ZRC 46167, 8 ex., 70.0–120.0 mm SL; ZRC 46383, 4 ex., 93.6–109.3 mm SL; Singapore: Pandan Canal. ZRC 52087, 1 ex., 157.4 mm SL; Singapore: Serangoon Reservoir. ZRC 53158, 1 ex., 139.0 mm SL; Singapore: Sungei Buloh Wetland Reserve.

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