

# First record of the Mozambique tilapia, *Oreochromis mossambicus* Peters, 1852 (Perciformes, Cichlidae), on Kangean Island, Indonesia

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## Abstract

In 2019 we captured specimens of *Oreochromis mossambicus* Peters, 1852 from Batu Batu River, an estuary river on Kangean Island (Indonesia), a conservation area in the Java Sea. These records are among the first of this species from an island in the Java Sea. A description of morphological characters of sampled specimens is provided.

## Keywords

Cichlid, distribution, estuary, non-native

## Introduction

*Oreochromis mossambicus* Peters, 1852 is a tilapia native to coastal regions and the lower reaches of rivers in southern Africa, from the Bushman River in the Eastern Cape to Zambezi River delta (Bruton and Bolt 1975; Cooper and Harrison 1992). It is now introduced to many countries for aquaculture (Arthington et al. 1984). *Oreochromis mossambicus* exhibits tolerance to salinity (de Moor et al. 1986; Russell et al. 2012). It can have negative impacts on aquatic communities through predation, competition for food and other resources, and as a vector of disease causing pathogens (Barker et al. 2002; Cucherousset and Olden 2011).

Tilapias have generally spread in mainland Indonesia (brackish and freshwaters) where aquaculture activities have been underway for some time (Basuki and Sri 2014). Kangean, one of islands in the Java Sea, is a conservation area and has no record of culturing tilapia. The presence of *O. mossambicus* on Kangean constitutes a new record.

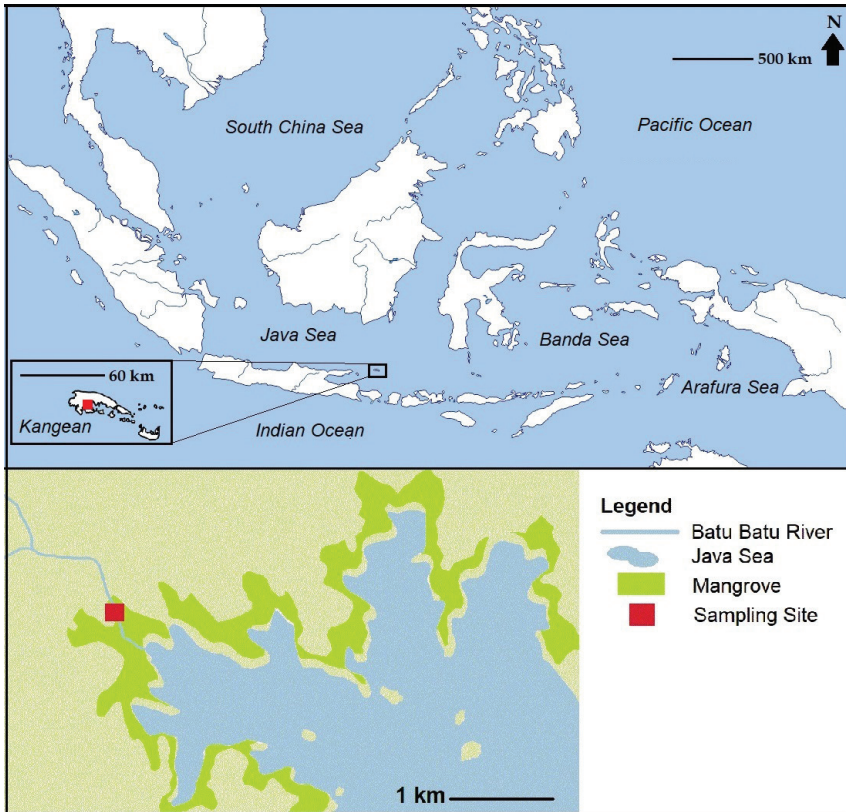
Specimens of *O. mossambicus* were captured with land net on 18–19 March 2019. The specimens were preserved in 10% formalin solution and deposited at the Hydrobiology Laboratory, Brawijaya University, Malang, Indonesia (HB.Om.III.2019). Diagnostic morphological characters of the specimens were analyzed following Trewavas (1983).

New records. (Figs 1, 2). Indonesia: Java Sea: Kangean Island: Batu Batu River (6°55'09"S; 115°19'53"E), 18–19 March 2019, V. Hasan leg. (9 specimens, total length 6.6–23.1 cm, photographed).

The meristic characters are shared with *Oreochromis mortimeri*, and both species are close to *Oreochromis spilurus* in numbers of vertebrae, dorsal rays and gill rakers. *Oreochromis placidus* usually has five anal spines and a higher number of dorsal spines. *Oreochromis urolepis* has greater numbers of gill rakers and the mean number of dorsal rays is greater. Its pharyngeal teeth are somewhat coarser and adults may have a densely scaled caudal fin. Other specific morphological characters are as follows: Snout long; forehead with relatively large scales, starting with two scales between the eyes followed by nine scales up to the dorsal fin. Snout duckbill-like due to enlarged jaws, often causing upper profile to become concave. Pharyngeal teeth very fine and dentigerous area with narrow lobes, blade in adults longer than dentigerous area; lower gill rakers 14–20; caudal fin not densely scaled; vertebrae 28–31; dorsal spines 15–18; dorsal soft rays 10–13; anal spines 3; anal soft rays 7–12. All of these characters were found in the specimens of Tilapia from Batu Batu River, Kangean Island.

In the 20<sup>th</sup> century alone, tilapias were introduced into many countries (Shelton and Popma 2006). Tilapias in general are listed among the top 100 worst alien species around the globe and have successfully established in more than 90 countries on five continents (all except Antarctica) (Russell et al. 2012).

The first establishment of tilapias is believed to have occurred in Java in the 1930s as a result of an aquarium release of *O. mossambicus* (Courtenay and Wil-



**Figure 1.** Location of Batu Batu River on Kangean Island (Indonesia) in the Java Sea.



**Figure 2.** Batu Batu River, location where *Oreochromis mossambicus* was found on Kangean Island (Indonesia) in the Java Sea.



**Figure 3.** Fixed specimen of *Oreochromis mossambicus* (Hb.Om.III.2019) found in Kangean Island (Indonesia) in the Java Sea.

liams 1992). Due to aquaculture, *O. mossambicus* now occurs in all brackish and freshwaters of mainland Indonesia. Its presence on the estuary of Kangean Island, in the Java Sea and 185 km from the nearest mainland (Fig. 3), represents a new record. Estuary conditions on Kangean Island, namely temperature 27–30 °C; salinity 9–25 ppt, depth 0.5–2 m and current velocity 10 cm/s, are ideal for *O. mossambicus* reproduction and survival (Riede 2004).

We speculate that *O. mossambicus* was released into an estuary on the Kangean Island by local people, but the purpose is not clear. As the island does not have an aquaculture industry, further investigation is warranted to determine the source of *O. mossambicus* on Kangean Island. In the future further introductions should be prevented to reduce the impact of *O. mossambicus* on the conservation area on does not disturb the conservation area (de Silva et al. 2004; Picker and Griffiths 2011).

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