THE RANGE EXPANSION OF *Parachromis managuensis* GÜNTHER, 1867 (PERCIFORMES, CICHLIDAE) IN JAVA, INDONESIA

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ABSTRACT

The Jaguar cichlid, *Parachromis managuensis* (Günther, 1867), is native to Central America, with introductions reported from West Java and Central Java Provinces of Indonesia. On 7-8 January 2019, sixteen specimens of *P. managuensis* were collected from Karangkates, the largest hydropower reservoir in East Java Province of Indonesia. A description of the morphological characters of specimens is provided.

Keywords: Cichlid, distribution, freshwater fish, Jaguar Guapote

INTRODUCTION

Parachromis managuensis (Günther, 1867), is a cichlid native to Costa Rica, Nicaragua and Honduras (Conkel 1993), but it has been introduced to several countries in North America (Fuller *et al.* 1999), South America (Magalhães & Jacobi 2013), and Southeast Asia (Agasen *et al.* 2006). *Parachromis managuensis* exhibits highly predatory habits and tolerance to new habitats (Rosana *et al.* 2006; Agasen *et al.* 2006), which make *P. managuensis* potential to become an invasive species (Yamamota & Annete 2000).

Parachromis managuensis is generally sold as ornamental fish and has not been cultured openly. *P. managuensis* in Indonesia is firstly found in the freshwaters of West Java (Dahruddin *et al.* 2016) and Central Java (Hedianto *et al.* 2013) Provinces of Indonesia. The presence of *P. managuensis* at the Karangkates Reservoir is considered a new finding because there has been no previous record of exotic fish culture in Karangkates Reservoir, the largest hydropower reservoir in East Java Province.

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MATERIALS AND METHODS

The Fish Sampling and Description of the Study Sites

Sixteen (16) live specimens of *P. managuensis* were obtained from a local angler during fieldwork conducted on 7 - 8 January 2019 at the Karangkates Reservoir (8°11'16"S; 112°27'22"E) (Fig. 1). Administratively, the Karangkates Reservoir is located in Malang Regency, East Java Province, Indonesia. Fishing gear used by the angler was a medium hook with a bottom and using worms as bait (Stein *et al.* 2012).

Figure 1 The collecting point of *Parachromis managuensis* at the Karangkates Reservoir in East Java Province

Fish Identification

The morphological characters of the fish specimens were determined by using the methods employed by Kullander and Hartel (1997) and Bussing (1998).

RESULTS AND DISCUSSION

Specimens Collection

The sixteen (16) live specimens of *P. managuensis* had a range of total length between 9.9 mm and 26.6 cm. Five (5) of the specimens were preserved in 96% alcohol solution (Hasan & Taman 2019) and transported to the Hydrobiology Laboratory, Universitas Brawijaya, Malang, Indonesia (voucher no. Hb.Pm.I.2019). The remaining eleven (11) specimens were kept as livestock at the Fish Reproduction Laboratory, Universitas Brawijaya, Malang, Indonesia. The 11 living specimens were transported in oxygen-filled polyethylene bags.

Diagnosis

The morphological characters of the specimens are as follows: a large mouth, projecting lower jaw, prominent enlarged canine teeth, a more or less continuous black stripe between the eye and opercular margin, and another stripe between the eye and the lower angle of the opercle, and a row of black blotches along the middle of the side.

The fish can be distinguished from other members of the genus by having the expanded preopercle at the angle. It has silvery or golden-green to purple body colors and black spots on the fins and body. There are also numerous black spots on the anal and caudal fins. The fish has moss green back, purple iridescence sides, and a whitish or yellowish belly. It also has whitish yellowish, or blue iridescence dorsal interspaces, and a black blotch on the caudal-fin base.

All of these characteristics were found in every specimen collected from the Karangkates Reservoir, East Java Province, Indonesia (Fig. 2).

Figure 2 Specimen of *Parachromis managuensis* captured on 8 January 2019 in Karangkates Reservoir, East Java Province

Distribution

The discovery of *P. managuensis* in Karangkates Reservoir is the first record of this species in East Java Province. Other discoveries occurred at reservoirs in West Java and Central Java Provinces. The discovery in Karangkates Reservoir represents a discovery in the eastern part of Java Island, which is around 400 km apart from the Central Java Province (Fig. 3). This record is an important contribution to understanding the dispersal of alien fish species in Indonesia.

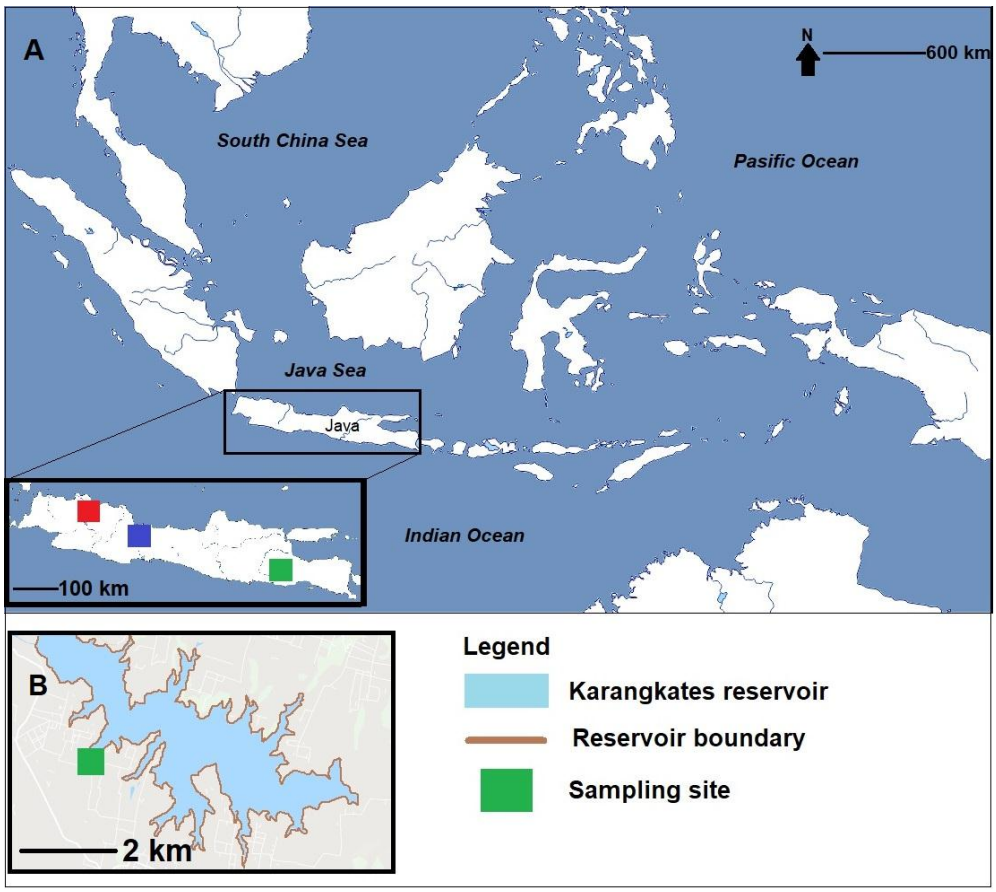

Figure 3 A. Distribution of *Parachromis managuensis* in Java Island
Notes: Red square: West Java Province; Blue square: Central Java Province; Green square: East Java Province).
B. Location of the Karangkates Reservoir in East Java Province
Note: The green square indicates the new record of *P. Managuensis*.

We speculated that *P. managuensis* were released into Karangkates Reservoir in East Java Province by exotic fish hobbyists without clear purposes. Further investigation is warranted to determine the source of *P. managuensis* in East Java Province because the reservoir has never been used for any exotic fish culture industry. Control and prevention of further introductions are needed to prevent alien fish from disturbing the freshwaters ecosystem (Hasan *et al.* 2020; Wijayanti *et al.* 2021; Hasan *et al.* 2021).

CONCLUSION

Parachromis managuensis is a non-native fish of Indonesia. This fish species has been found in freshwater in West Java and Central Java Provinces and also in the Karangkates Reservoir in East Java Province. The existence of *P. managuensis* in East Java is considered a new finding and added data on the alien fish species distribution in Indonesia.

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