

# Morphometric variations of fish from Brantas river, East Java, Indonesia

**Alfiah Hayati\***, Muhammad Fadhil Mirza Rasyad, Imam Dary Supriyadi Putra, Tri Nurhariyati, Muhammad Hilman Fu'adil Amin, Trisnadi Widyaleksono Catur Putranto, Aken Puti Wanguyun, Sugiharto and Mochammad Affandi

*Biology Department, Faculty of Science and Technology, University of Airlangga, Surabaya, Indonesia*

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## ABSTRACT

The present study aimed to investigate the morphometric measurements and body weight of fish that live in the Brantas River, East Java. The sampling method of fish was done by capturing fish using nets, then morphometric measurements including fish weight. Sampling was carried out in two locations, including upstream and downstream of Brantas River in 2016. Furthermore, sampling for each location was repeated twice with 100 m distance differ. All data analysis were performed using SPSS version 21. The results showed that there was no significant difference ( $P > 0.05$ ) from morphometric measurements to body weight of fish, except *Barbonymus gonionotus* and *Barbonymus balleroides* in both locations. In addition, the fish that live upstream of the river have a higher morphometric measurements than those living downstream of the Brantas river.

**Key words:** Morphometric, Fish, Upstream, Downstream, Brantas River

## Introduction

Brantas River is located in East Java, Indonesia. This river is very important for the communities. The water from the river was used for many activities including a place to catch fish which can be consumed by the people. The river also becomes a water source for industries and public water supply. However, water quality of Brantas river was decline in the last few decades, both in the upstream (Karangkates reservoir) and downstream (flow to Surabaya) (Hayati *et al.*, 2017<sup>a</sup>). A lot of anthropogenic pressures from settlements and industries along streams such as paper, ceramics, bicycles, nuts and bolts causing high concentrations of contaminants like heavy metals.

The heavy metals are toxic, thus disrupting the

health of freshwater fish (Jia *et al.*, 2017). The impact of exposure to heavy metals causes the damage and death (apoptosis) of fish cells and tissues that can lead to fish death. For example, Pb and Cr at low concentrations lead to liver cell necrosis, while at high concentrations cause damage to gills (Hayati *et al.*, 2017<sup>b</sup>).

The contamination of heavy metals (Pb, Cr, Cu, and Cd) in Brantas River has exceeded the quality standards. Their concentrations were higher in downstream than in upstream (Hayati *et al.*, 2017<sup>a</sup>). Several species of fish in the Brantas River were often found dead. The death of the fish in the river is suspected caused by dangerous chemicals produced by industries that was dumped on the river bank. Furthermore, the high contamination of heavy metals in the river can decrease the diversity of fish. Therefore,

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\*Corresponding author email: alfiah-h@fst.unair.ac.id