AN UPDATED CHECKLIST OF *RASBORA BALIENSIS* (HUBBS & BRITTAN 1954) (CYPRINIFORMES: CYPRINIDAE) IN INDONESIA

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ABSTRACT *Rasbora baliensis* (Hubbs & Brittan, 1954) is a native freshwater fish from Indonesia, which was described in East Java, Bali Island, and the West Lesser Sunda Islands. In the present paper, we reported on the presence of *R. baliensis*, which was collected from several new rivers in Java and East Lesser Sunda Islands. The specimen was identified as *R. baliensis* based on the number of scales on the lateral line 26 and on the predorsal 12; the upper head and body are light brown while the lower jaw and belly are silver; mid-lateral stripe from opercle to caudal base light blue; dorsal, caudal, and anal fins yellowish; and pectoral and ventral fins hyaline. The paper also showed the current distribution range of this species. The new records of native freshwater fish are important contributions to understanding species diversity and biogeography.

Keywords: cyprinids, distribution, freshwater, Sundaland

1. INTRODUCTION

Cyprinidae is the largest family of freshwater fish and is found throughout much of the world, with the exception of South America, Madagascar, and Australasia (Nelson, 2006; Kottelat, 2013; Hasan et al., 2019a; Hasan et al., 2019b). *Rasbora* is one of the most species-rich genera in the family Cyprinidae, with 70 valid species currently living throughout South Asia, Indochina, Southern China, Malay Peninsula, and Western Indonesia Archipelago (Sundaland) (Rainboth, 1991; Lumbantobing, 2010; Kusuma et al., 2016). One of the *Rasbora* found in Indonesia is *Rasbora baliensis* (Hubb & Brittan, 1954). *Rasbora baliensis* was listed as a Least Concern (LC) species based on the IUCN Red List Status (Lumbantobing, 2021).

When it was first described, *R. baliensis* was considered endemic to

Bratan Lake, Bali Island (Brittan, 1954; Kottelat et al., 1993). Previously, *Rasbora* from Bali Island was considered as *R. lateristriata* (Weber & de Beaufort, 1916). Redescription of the specimen *Rasbora* from Bratan Lake, Bali Island by Hubbs and Brittan in 1954 confirmed that the species is distinct from *R. lateristriata*. However, recent research showed that this fish was also found in East Java and was introduced to the West Lesser Sunda Islands such as Lombok Island, Sumbawa Island, Flores Island, and Sumba Island (Hubert et al., 2019; Lumbantobing, 2021). In this paper, we report on the presence of *R. baliensis* for the first time in several new rivers that were not sampled previously in Java and Timor Island. The last locations were in the East Lesser Sunda Islands. These records showed that the furthest distribution range of *R. baliensis* was in Java and Lesser Sunda Islands.

2. MATERIALS AND METHODS

Rasbora baliensis specimens were captured using a small hook, landing net, and fish trap from 11th April to 1st November 2020 in Java and East Lesser Sunda Islands (Figure 1). Photographs of live specimens were taken, while vouchers specimens were labeled and preserved in 96% ethanol (Hasan & Tamam, 2019). The examined materials were deposited at the Zoology Laboratory, Generasi Biologi Indonesia Foundation (GBI). Diagnostic morphological characters of the specimens were analyzed following Brittan (1954) and Kottelat et al. (1993).

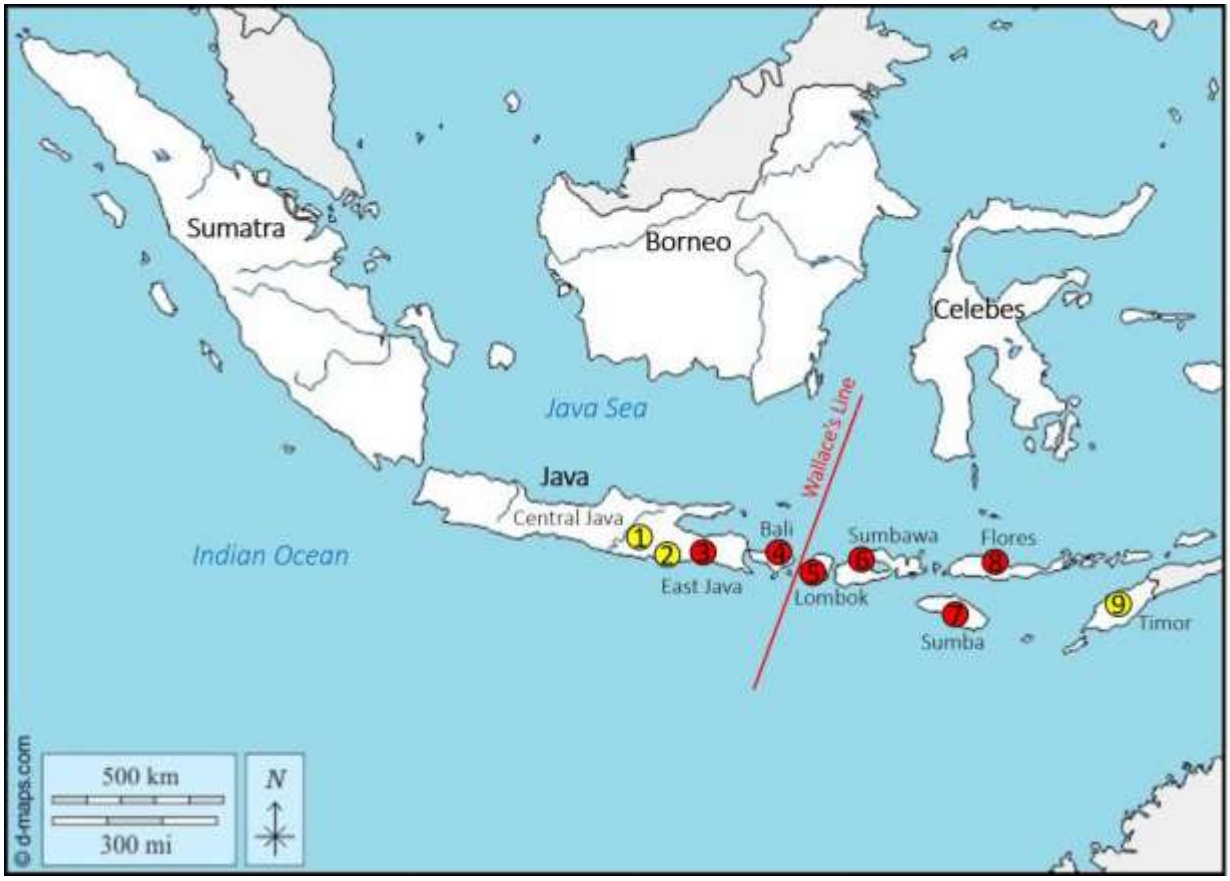

Figure 1. Records of *Rasbora baliensis* in Java and the Lesser Sunda Islands based on previous studies (red circles) and present study (yellow circles). Numbers refer to all the records of this species which correspond to the numbers given in Table 1 (see table for detailed localities and sources).

Table 1. Records of *Rasbora baliensis* in Indonesia (Java, Bali, and the Lesser Sunda Islands). Records are listed from east to west. Numbers refer to localities in Figure 1.

No. Site	Localities	Sources
1	Solo River, Central Java	This study
2	Brantas River, East Java	This study
3	Lumajang, East Java	Hubert et al., 2019; Lumbantobing, 2021
4	Bali Island	Brittan, 1954; Hubert et al., 2019; Lumbantobing, 2021
5	Lombok Island	Hubert et al,. 2019; Lumbantobing, 2021
6	Flores Island	Lumbantobing, 2021
7	Sumba Island	Lumbantobing, 2021
8	Oehala River, Timor Island	This study

3. RESULTS AND DISCUSSIONS

Specimens collected from the sampling sites were identified as *R. baliensis* based on the number of scales on the lateral line 26 and on the predorsal scales 12. *Rasbora baliensis* is almost similar to *R. lateristriata*; however, *R. baliensis* can be distinguished from *R. lateristriata* by the combination of the following meristic characters: (1) the number of scales on the lateral line with 26-28 in *R. baliensis* and 29-33 in *R. lateristriata*; and (2) the number of scales on the predorsal scales with 11-12 in *R. baliensis* and 12-14 in *R. lateristriata*. The coloration of fresh specimen: upper head and body light brown, while the lower jaw and belly are silver; mid-lateral stripe from opercle to caudal base light blue; dorsal, caudal, and anal fins yellowish; and pectoral and ventral fins hyaline (Figure 2 and 3).

Figure 2. Fresh specimen of *Rasbora baliensis* collected from Brantas River, East Java (Photo: Dicky Eko Febriantoro).

Figure 3. A live specimen of *Rasbora baliensis* collected from the Solo River, Central Java (Photo: Heri Cahyono).

The natural distribution of cyprinids in Indonesia is in the western Indonesia archipelago such as Sumatra, Borneo, Java, and the small islands around it; whereas, the Wallace area (Lombok, Sumbawa, Sumba, Flores, and Timor Island) is not their natural distribution area (Berra, 2001; Lumbantobing, 2014). The presence of non-native freshwater fish beyond their natural distribution is possible due to the introduction by humans for aquaculture or aquarium trade (Hasan et al., 2019c; Insani et al., 2020; Hasan et al., 2020a; Wijayanti et al., 2021; Mangitung et al., 2021; Serdiati et al., 2021). These fishes are released into the rivers or lakes and are then able to adapt to the new environment. Cyprinids are tolerant to new environments (Hasan et al., 2020b), whereby several cases have proven that these fishes are able to reproduce massively in areas that are not their natural habitats such as in South America (Troca et al., 2012; Maiztegui et al., 2019) and Australia (Pinto et al., 2005; Haynes et al., 2009).

Among other biological concerns, such new records of native freshwater fish contribute significantly to our knowledge and understanding of species biogeography and diversity (Hasan & Widodo, 2020; Hasan & Islam, 2020; Hasan et al. 2021a; Hasan et al. 2021b; Hasan et al., 2021c; Hasan et al., 2021d). As reported in this paper, the presence of *R. baliensis* in Brantas River and Solo River are new records of this species being found beyond its previous records in the rivers of Java. Furthermore, the new discovery of *R. baliensis* in Oehala River, Timor Island has revealed the western-most records of *R. baleinsis* in its distributional range. Given that the distribution of *R. baliensis* is now known to be more widespread than before, its conservation status in the IUCN Red List therefore needs to be reviewed.

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