

*Cyclocheilichthys apogon* on Madura Island

1 **ACCEPTED MANUSCRIPT**

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3 NEW DISTRIBUTIONAL RECORD OF THE BEARDLESS BARB *Cyclocheilichthys apogon*  
4 (VALENCIENNES, 1842) (CYPRINIFORMES: CYPRINIDAE) FROM MADURA ISLAND,  
5 INDONESIA

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9 DOI: 10.11598/btb.....

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11 To appear in : BIOTROPIA Issue

12

13 Received date : 25 June 2019

14 Accepted date : 07 January 2020

15

16 **This manuscript has been accepted for publication in BIOTROPIA journal. It is unedited, thus,**  
17 **it will undergo the final copyediting and proofreading process before being published in its final**  
18 **form.**

19 **NEW DISTRIBUTIONAL RECORD OF THE BEARDLESS BARB *Cyclocheilichthys apogon***  
20 **(VALENCIENNES, 1842) (CYPRINIFORMES: CYPRINIDAE) FROM MADURA ISLAND,**  
21 **INDONESIA**

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34 **ABSTRACT**

35 Beardless Barb *Cyclocheilichthys apogon* (Valenciennes, 1842) is a species known from  
36 Southeast Asia, including Western Indonesia area (Borneo, Sumatra and Java). In Java Island, it was  
37 previously found in the mainland area. This paper provides the first record of *C. apogon* in the  
38 Lembung River, one of the major rivers in Madura Island, thereby extending the species distribution  
39 up to 150 km northeast from the earlier record. The specimens of *C. apogon* were characterized as  
40 follows: dorsal fin rays 12; anal fin rays 8–9; pectoral fin rays 17–18; lateral line scales 34–35. A  
41 description of detailed morfological characters of a specimen are provided.

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43 **Keywords:** Cyprinid, distribution, freshwater fish  
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45 **INTRODUCTION**

46 In the last glacial era, Southeast Asia and Western Indonesia (Sumatra, Borneo and Java) were  
47 still connected as a single area called Sundaland, where many blocth rivers were connected to each  
48 other, extending from Indochina to the Java Sea (Voris 2000). Major rises in sea level in the South  
49 China Sea and Java Sea occurred in that era divided Sundaland into several archipelagos (Pubellier  
50 and Morley 2014). This geographical change has resulted in the isolation of several freshwater fishes  
51 (Hubert et al. 2015), one of which was the Beardless Barb *Cyclocheilichthys apogon* (Weber and de  
52 Beaufort 1916).

53 *Cyclocheilichthys apogon* (Class: Actinopterygii; Order: Cypriniformes; Family: Cyprinidae)  
54 is a freshwater fish native to the Southeast Asia and the Western Indonesia (Rainboth 1996; Kottelat  
55 2001; Kenthao and Jearanaiprepam 2018). *Cyclocheilichthys apogon* ranged widely in the rivers  
56 across the mainland Java area, which includes East Java, Central Java and West Java (Weber and de  
57 Beaufort 1913; Roberts 1993). This paper reports the presence of *C. apogon* in the Lembung River,  
58 Madura Island, and it is expected to increase the knowledge of the previously known distribution  
59 range of this species.

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## MATERIALS AND METHODS

Nineteen (19) live specimens of *C. apogon* were obtained from local fishermen during a fieldwork carried out on 22-23 March 2019 on Lembung River (7°02'21"S, 113°46'35"E) (Figure 1). Administratively, the site is located on Madura Island, Sumenep Regency, East Java Province, Indonesia. The fishing gear used by the fishermen was a small hook with bottom with molluscs as the baits (Stein et al. 2012).



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Figure 1. Lembung River, Madura Island, showing the location where *Cyclocheilichthys apogon* were collected 23 March 2019.

In order to ensure the validity of the species, the morphological character analysis of *C. apogon* was carried out based on Weber and de Beaufort's (1916) model.

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## RESULTS AND DISCUSSION

The nineteen (19) live specimens of *C. apogon* had a total length between 7.8 and 16.1 cm and weight between 55.5 and 204 grams. Five (5) of them were used as preserved specimens in 96% alcohol solution (Hasan et al. 2019) and deposited at the Hydrobiology Laboratory, Universitas Brawijaya, Malang, Indonesia (UB.0002). The remaining fourteen (14) were kept as livestock at the

79 Fish Reproduction Laboratory, Brawijaya University, Malang, Indonesia. The 14 live specimens were  
80 transported in polyethylene bags with oxygen.

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## 82 **Identification**

83 *Cyclocheilichthys apogon* is distinguished from the other species of *Cyclocheilichthys* by no  
84 barbels in snout but there are conspicuous folds of the skin above upper lip. Other morphological  
85 characters of the 5 preserved specimens are as follows: dorsal fin rays 12; anal fin rays 8–9; pectoral  
86 fin rays 17–18; lateral line scales 34–35; head pointed, lips are swollen, with both lips evenly curved;  
87 dorsal deeply concave, origin of dorsal is opposite to 13<sup>th</sup> scale of lateral line and nearly in the middle  
88 of a line, connecting the end of the snout and the end of the shortest caudal rays, the location of which  
89 is nearer to snout in young specimens, far behind the origin of ventrals; anal concave, with a rather  
90 weak third spine that is longer than half head; pectorals reach the ventrals; ventrals are about equal to  
91 the pectorals, reaching or surpassing the anal; caudal deeply incised, while the lobes are rounded.  
92 Coloration in fresh specimen: yellowish brown, upper parts are dark brown, and each scale has a dark  
93 spot at the base; vertical fins have darkish colours, the others more or less hyaline. There is a blotch  
94 at the end of the lateral line. All of these characters were found in every specimen collected from  
95 Lembung River, Madura Island (Fig. 2).

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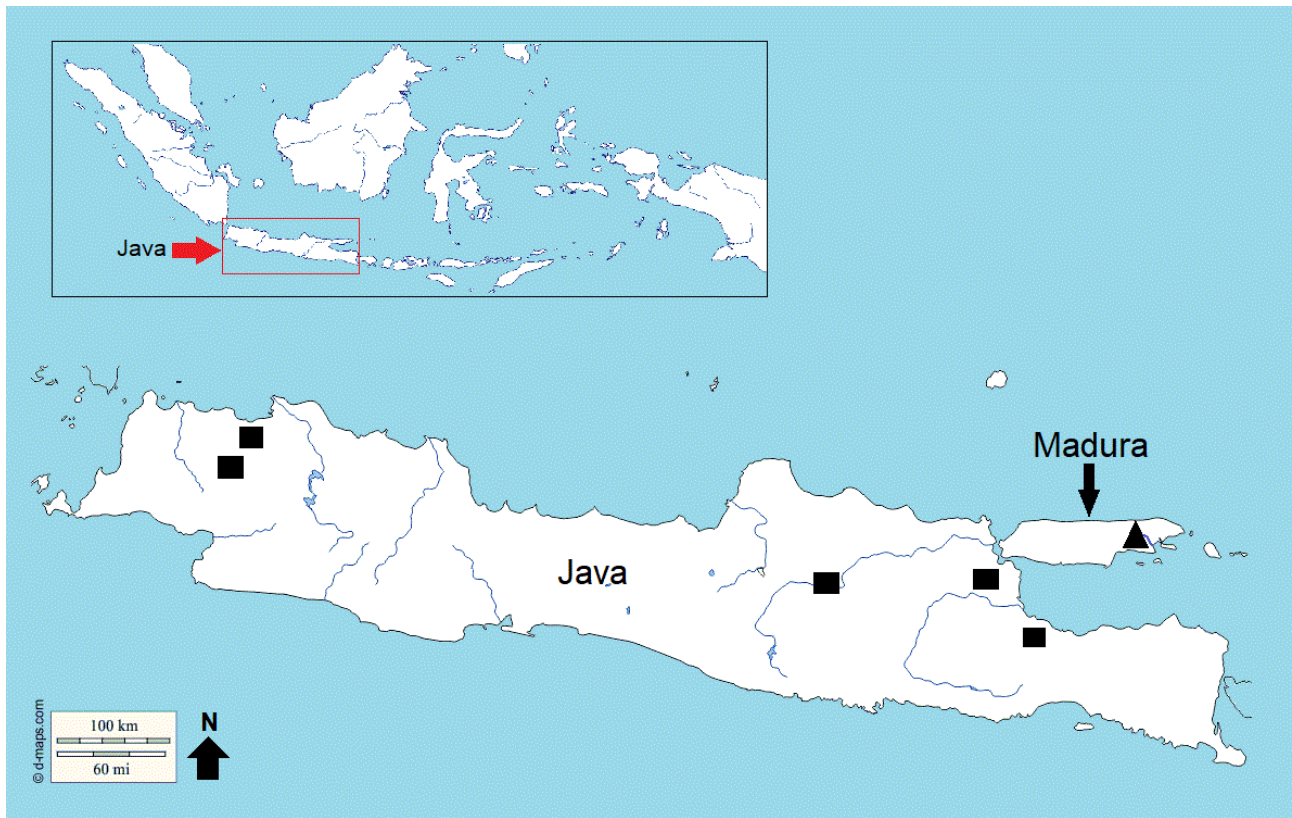
98 Figure 2. Specimen of *Cyclocheilichthys apogon* captured on 23 March 2019 from Lembung River,  
99 Madura Island.

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## 101 **Distribution**

102 The discovery of *C. apogon* in the Lembung River, Madura Island, is the first record of this  
103 species beyond its type locality (mainland of Java: Batavia, Buitenzorg, Ngawi, Surabaya and  
104 Pasuruan) (Weber and de Beaufort, 1916), and represents the easterly extension of previously known  
105 distribution about 150 km (Figure 3).





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107 Figure 3. Known distribution of *Cyclocheilichthys apogon*. Black square are the previous records of  
108 the species based on Weber and de Beaufort's (1916) observation, mainland Java. Black  
109 triangle is the recent record on Lembung River, Madura Island.

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111 The record of *Cyclocheilichthys apogon* in the Lembung River, Madura Island, is the first  
112 record of this species in outside the mainland Java. For a native species, new records are important  
113 contributions for understanding species diversity and biogeography, among other biological topics  
114 (Souto-Santos 2019). As reported in this paper, the new record of *C. apogon* helped to improve the  
115 knowledge of the species as it extends the distribution range of the species further northeast.

116 There are several studies on freshwater fish in Indonesia which are sometimes limited to single  
117 rivers. The case in Sumatra, Tan and Kottelat (2009) have recorded *Crossocheilus obscurus* Tan &  
118 Kottelat, 2008 on Batang Hari Basin, then Iqbal et al. (2017) added *C. obscurus* also recorded on  
119 Musi Basin where the distance between the location of the first and the second recording was more  
120 than 250 km. The discovery of *C. apogon* on Madura Island could be caused by the Lembung River  
121 was being connected to East Sunda River at last glacial era (Hanebuth et al. 2000; Sathiamurthy and  
122 Voris 2006), then being cut off and isolated due to rising sea levels. Besides geological factors, the  
123 spread of freshwater fishes outside the mainland could occur due to human introduction factors.

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## CONCLUSION

*Cyclocheilichthys apogon* is a Southeast Asian native fish that is not only spread on the mainland of Java, but this fish also exists on the island of Madura whose position is at the eastern end of Java. The existence of *C. apogon* in a remote area added to the data on the distribution of fish in Indonesia.

## ACKNOWLEDGEMENTS

We thank the local fishermen acting as our field guides and the Ministry of Finance of the Republic of Indonesia which funded our work (grant no. 20160221035555).

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