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First photographic inland record of the Bull shark *Carcharhinus leucas* (Müller and Henle 1839) (Carcharhiniformes: Carcharhinidae) in Java, Indonesia

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ABSTRACT

A single specimen of a sub-adult Bull shark *Carcharhinus leucas* (Müller and Henle, 1839) with c.104 cm of total length was landed and photographed on 18 October 2014 in Ciwulan River, West Java Province, Java Island, Indonesia. This rare finding represents the first-ever known record of *C. leucas* in Javan freshwaters, and only the fifth freshwater record in Indonesia besides former records of *C. leucas* from the islands of West-Papua, Sumatra, Borneo, and Celebes.

Key words: Biogeography, Distribution, Elasmobranchs, Freshwaters, Requiem sharks, Carcharhinidae

Introduction

Carcharhinidae (requiem sharks) is one of the largest shark families that is spread in the tropical, subtropical, and temperate waters worldwide. Although most species inhabit continental coastal and offshore marine waters, the family includes the only euryhaline shark species (Compagno *et al.*, 2005) with a few members that are capable to enter fresh and brackish waters. The Bull shark *Carcharhinus leucas* is one of the few requiem sharks that is truly euryhaline and is a common species that occur in marine and coastal riverine environments including estuaries, rivers, and lakes (Gausmann 2018).

Carcharhinus leucas is a top aquatic predator, and the only known previous freshwater records of this species in Indonesia derive from West-Papua (Boeseman, 1964), Sumatra (Tan and Lim, 1998; Hasan and Widodo, 2020), Borneo Kalimantan (Iqbal *et al.*, 2019b), and Celebes (Hasan and Islam, 2020). However, Java Island of Indonesia is not included in the freshwaters distribution map of *C. leucas* in many important non-marine elasmobranchs references (Compagno and Niem, 1998; Last *et al.*, 2010). In this paper, we report the presence of *C. leucas* in the Ciwulan River, Karangnunggal Sub-District, Tasikmalaya District, West Java Province, Indonesia, which documents an

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extension of the known range for this species in the Indo-Malayan Region and the eastern Indian Ocean.

Materials and Methods

A single female specimen of a sub-adult *C. leucas* (c. 102 cm of total length) was landed and photographed on 18 October 2014 in Ciwulan River, Karangnunggal Sub-District, Tasikmalaya District, West Java Province, Java Island, Indonesia (7°42'06"S; 108°09'03"E) (Fig. 1). The site of the capture is in inland Java at a freshwater habitat located in c. 11 km distance from estuary. Diagnostic morphological characters of the single specimen were analyzed under consideration of the methods by Compagno (1998).

Results and Discussion

This shark was identified as *C. leucas* by the snout much shorter than the width of mouth and bluntly rounded, first dorsal fin triangular, rearward sloping, originating over or slightly behind pectoral insertion, second dorsal fin much smaller than the first dorsal fin (< 3,1:1), and lack of an intradorsal ridge. The coloration of fresh specimen: greyish back and white belly, the black coloration on the tip of the caudal fins and second dorsal fin. The characters above are fitted well to the features of sub-adult *C. leucas* (Compagno *et al.*, 2005). The absence of clasp-

ers identified the specimen as a female (Fig. 2).

The evidence of *C. leucas* in Ciwulan River, Tasikmalaya District, West Java Province, is the first record in freshwaters of Java, and the fifth freshwater



Fig. 2. Lateral view of the *C. leucas* specimen on the Ciwulan River, West Java Province, Indonesia. Photo: Rin Dama.

record beyond previous records from the archipelago of Indonesia (West-Papua, Borneo, Sumatra, and Celebes). Among other biological topics (Tony *et al.*, 2020; Hasan *et al.*, 2021c; Hasan *et al.*, 2019a; Hasan *et al.*, 2019b), the new record of near threatened fishes is an important contribution to raise an understanding of species biogeography (Hasan *et al.*, 2020; Hasan and Widodo 2020; Hasan *et al.*, 2021a; Hasan *et al.*, 2021b; Gani *et al.*, 2021). As reported in this paper, the new record of *C. leucas* will contribute to improve the knowledge of the species as it extends the distribution range of the species in Java.



Fig. 1. Location of the record of *C. leucas* (red square) found in freshwater habitat in Ciwulan River, West Java Province, Indonesia.

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