


First records of *Stigmatogobius yanamensis* Visweswara Rao, 1971 (Perciformes: Gobiidae) in Indonesian waters

MUHAMMAD IQBAL^{1*}, ARUM SETIAWAN¹ & INDRA YUSTIAN¹

¹Department of Biology, Universitas Indo Global Mandiri, Jalan Jend. Sudirman No. 629, Palembang 30129, South Sumatra, Indonesia

*Corresponding Author. E-mail: miqbal@uigm.ac.id;  <https://orcid.org/0000-0002-6657-0183>

²Department of Biology, Faculty of Science, Sriwijaya University, Jalan Raya Palembang-Prabumulih KM 32, Indralaya, South Sumatra, Indonesia

E-mail: arum.setiawan@unsri.ac.id;  <https://orcid.org/0000-0001-6024-1090>

E-mail: idr_yustian@unsri.ac.id;  <https://orcid.org/0000-0002-7226-078X>

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Abstract

Stigmatogobius yanamensis is a small and cryptic goby, whose distribution remains poorly known. On 2 April 2016, two specimens of *S. yanamensis* with a standard length of 20-21 mm were caught by hand net in the intertidal zone of estuarine mangroves, above a muddy substrate at the mouth of Sembilang River, South Sumatra Province, Indonesia. In addition, ten specimens were collected on 1-4 June 2023 in Sungsang (c. 40 km from Sembilang River) South Sumatra Province, Indonesia. This finding constitutes the first records of *S. minima* in Indonesian waters.

Keywords: cryptic, distribution, estuarine, small goby, *Stigmatogobius yanamensis*.

Introduction

Most marine fish live on or near the edges of the continents, from the intertidal regions to the edge of the continental shelf (Moyle & Cech 2004). Whereas the intertidal zone is where terrestrial and marine habitats meet, an estuary is a place where freshwater and saltwater meet (Nybakken 2001). The Asian region has some of the most extensive estuarine areas in the world, including the Ganges Delta in the Bay of Bengal, the Irrawaddy Delta of Burma, the Indus of Pakistan, the Mekong of Vietnam and the large estuaries of Borneo and Sumatra (Blaber 1997). There are many smaller estuaries, particularly in India, Malaysia and Indonesia; and All of these support diverse fish faunas and productive fisheries (Blaber 1997; Iqbal *et al.* 2019; Setiawan *et al.* 2019).

Gobioid fishes of the family Gobiidae occur most worldwide, in shallow inland and coastal waters (Larson *et al.* 2016). Gobies are the largest family of fish, comprising more than 220 genera and an estimated 2,000 species (Nelson 2006; Larson *et al.* 2016). The systematics and phylogeny of the gobies are acknowledged as being difficult, especially the smaller gobiids, which are often overlooked by collectors (Larson 2001). Most species are usually secretive in their habits and typically very small, as small as 8 mm in length (Larson & Murdy 2001). Furthermore, current descriptions and good illustrations are scattered and sometimes hard to find (Larson & Lim 2005). These difficulties have often been compounded when genera have been erected with merely a reference to the type species, the descriptions of which themselves are often inadequate and without figures (Gill *et al.* 1992; Gill 1993).

Stigmatogobius is a genus of Gobiidae that is rarely mentioned in taxonomic literature, although the name has been used in the past as a catch-all for a variety of misidentified species (Larson, 2005). *Stigmatogobius yanamensis* is one species of this genus, which was first described based on specimens from India: as *Ctenogobius minima* (Hora, 1923) based on specimens from Chilka Lake, and as *Stigmatogobius yanamensis* based on specimens from Godavari estuary (Larson & Hammer 2021). However, a later revision of the Gobiidae family put the species into the genus *Pseudogobius* (Larson

2001; Larson 2005), and it was named *Pseudogobius yanamensis* (e.g. Tran *et al.* 2013). The latest update resurrected *Stigmatogobius yanamensis* (Larson & Hammer 2021). In this paper, we report the presence of *S. yanamensis* in the Sembilang River of South Sumatra Province, which is the first record for Indonesian waters.

Methods

On April 2016, We conducted an ichthyofauna survey in the mouth of Sembilang River, Banyuasin District, South Sumatra Province, Indonesia (02°01'09.2"S, 104°41'15.9"E) (Fig. 1). This area is part of Berbak Sembilang National Park, the biggest and most important wetland in Sumatra (Yong *et al.* 2018; Iqbal *et al.* 2022). Collection of specimens is prohibited in the national park, without special permits, which we did not have. Therefore, no voucher specimens were preserved. On 2 April 2016, one male and one female *S. yanamensis* were caught by hand net, with a mesh size is 1 mm, in the intertidal zone of the mangrove forest; the bottom of the habitat is soft mud. The length measurements and characteristic details were recorded before the fish were released.



Figure 1. Map showing the known distribution of *Stigmatogobius yanamensis*, red triangles are previously known and a circle is recent distribution records (represent Sembilang River and Sungsang, Sumatra, Indonesia).

We conduct two follow-up field surveys to collect the specimen of *S. yanamensis* on the east coast of South Sumatra Province, including in Jeruju River of Ogan Komering Ilir District on 12-15 August 2022 (c. 150 km from Sembilang River, 03°33'53.6"S, 105°50'05.3"E), and in Sungsang of Banyuasin District on 1-5 June 2023 (c. 40 km from Sembilang River, 02°18'27.5"S, 104°54'57.8"E). No specimen of *S. yanamensis* was found in the Jeruju River of Ogan Komering Ilir District, but this species look common in Sungsang of Banyuasin District. We collect ten specimens from Sungsang of Banyuasin District using hand net, in the intertidal zone of the mangrove forest. All specimens were collected and deposited to Museum Zoology of Sriwijaya University (MZS) with catalogue number Muszoo/Ict/Deposit/Coll.01.02062023.

Results and Discussion

The specimens of small goby found from Sembilang River have the following characteristics: body elongate; snout rounded, overhanging upper lip; mouth slightly oblique, upper jaw prominent, teeth very small; conspicuous black bar on first dorsal fin; three large rounded spots at caudal fin base.

Colour in life: pale or pale yellow with four or five oval blotches on the flank (Figs 2-5). The morphometric and meristic characters were summarised in Table 1.

Table 1. Comparison of morphometric and meristic characters of *Stigmatogobius yanamensis*.

Character	Present study	Krishnan & Mishra 2001; Mishra <i>et al.</i> 2013; Froese & Pauly 2023
Number of specimen	10	Not available
Standard Length	20-21 mm	20 mm
First dorsal fin	(VI+1)	VII (VI+1)
Second dorsal fin	I, 7-8	I, 8
Anal fin	I, 8-9	I, 7-8
Pectoral fin	14-15	15
Segmented caudal fin	15-16	15-16

We identified the fish as *S. yanamensis* as these features agreed with the descriptions of recent authorities (Talwar & Jhingran 1991; Tran *et al.* 2013; Froese & Pauly 2023). The male had 20 mm SL (Standard Length) and the female had 21 mm. It is reported that *S. yanamensis* can reach up to 30 mm SL (Tran *et al.* 2013). We have shared the photographs of our specimens and our tentative identification with Dr. Helen Larson (Curator Emeritus, Fishes, Museum and Art Gallery of the Northern Territory, Australia), a leading Gobiidae expert for Indo-Pacific waters. She has confirmed that our specimens are indeed *S. yanamensis*.



Figure 2. The dorsal view of live specimens of *Stigmatogobius yanamensis* caught on 2 April 2016 in Sembilang River, Banyuasin District, South Sumatra Province, Indonesia (Photograph by Muhammad Iqbal).



Figure 3. Female *Stigmatogobius yanamensis* with 21 mm SL, caught on 2 April 2016 in Sembilang River, Banyuasin District, South Sumatra Province, Indonesia (Photograph by Muhammad Iqbal).



Figure 4. Male *Stigmatogobius yanamensis* with 20 mm SL, caught on 2 April 2016 in Sembilang River, Banyuasin District, South Sumatra Province, Indonesia (Photograph by Muhammad Iqbal).



Figure 5. Preserved *Stigmatogobius yanamensis* with 21 mm SL, caught on 2 June 2023 in Sungsang, Banyuasin District, South Sumatra Province, Indonesia (Photograph by Muhammad Iqbal).

Gobies of the genus *Pandaka* are similar to *S. yanamensis*. *Pandaka* are small, slender-bodied gobies, having a first dorsal fin with a narrow dark bar extending to the body, a body with spots of diffuse bands, and dusky vertical marks on the cheeks (Kottelat *et al.* 1993; Larson 2001; Larson & Murdy 2001). *Stigmatogobius yanamensis* differs from *Pandaka* by having a first dorsal fin whitish with a black band that does not reach the body, paler spots on the body and absence of dusky vertical marks on the cheek. The habitat has a soft muddy substrate in the intertidal zone of mangrove forest; similar habitat to the most recent report of this species (Kano 2017).

The finding of *S. yanamensis* in the east coastal zone of South Sumatra Province is the only known record of this species in Indonesian waters. This species was recorded on the northeast coast of India, the Vietnamese Mekong Delta and Singapore (Talwar & Jhingran 1991; Tran *et al.* 2013; Kano 2017; Tan & Lim 2019; Froese & Pauly 2023). The most likely reason why *S. yanamensis* has only been found recently in Sembilang River and Sungsang of South Sumatra Province is that the fish fauna of South Sumatran waters is little explored. Few species of fish are known to occur in the South Sumatran waters of Indonesia, and some, such as *Crossocheilus obscurus*, *Fluvitrygon oxyrhynchus*, *F. signifer*, *Lobocheilos ixocheilos* and *Urogymnus polylepis* have only been recorded recently (Iqbal & Yustian 2016; Iqbal *et al.* 2017a, b, c; Iqbal *et al.* 2018). In addition, the lack of local Gobiidae experts and the small size and cryptic appearance leads to the species being overlooked by researchers. The record of *S. yanamensis* in Indonesian waters extends the species' range over 1,000 km to south of the equator (2°S). The species should be sought elsewhere in Indonesia.

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