

Notes on the Presence of Combtooth Blennies (Blenniiformes: Blenniidae) in Lampung Province, Sumatra, Indonesia

GUSTI AYU WIDAYANTI^{1*}, DELON DIAN PUTRA², INA APRILLIA¹, AULIA
SALSABILA², NUR ARIFAH¹, MUHAMMAD AFLAH², AYU KARLINA² &
MUHAMMAD IQBAL¹

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

*Corresponding Author. E-mail: gustiah@uigm.ac.id;  <https://orcid.org/0009-0001-7336-8581>

E-mail: inaaprillia@uigm.ac.id;  <https://orcid.org/0000-0003-3531-2445>

E-mail: nura@uigm.ac.id;  <https://orcid.org/0009-0002-2105-5775>

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

²Biology Program, Universitas Indo Global Mandiri, Jalan Jend. Sudirman No. 629,
Palembang 30129, Sumatera Selatan, Indonesia

E-mail: 2023150010@students.uigm.ac.id;  <https://orcid.org/0009-0009-7474-951X>

E-mail: auiasalsabila2727@gmail.com;  <https://orcid.org/0009-0000-0162-2459>

E-mail: dozerr27@gmail.com;  <https://orcid.org/0009-0007-0674-6347>

E-mail: ayu.karlina@uigm.ac.id;  <https://orcid.org/0009-0005-1270-6339>

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Abstract

Combtooth Blennies (Blenniiformes: Blenniidae) are small, cryptic coastal fishes that are often underrepresented in regional ichthyofaunal surveys. Lampung Province, located at the southern tip of Sumatra, encompasses diverse coastal habitats suitable for blenniid fishes; however, information on their occurrence remains limited. Here, we present preliminary records of Combtooth Blennies from Lampung Province, based on field observations and photographic documentation conducted between 2017 to 2025, complemented by verified citizen-science records. A total of seven taxa representing five genera were recorded, including *Alticus saliens*, *Aspidontus taeniatus*, *Entomacrodus vermiculatus*, *Istiblennius* sp., *Istiblennius dussumieri*, *Salarias* sp. and *Salarias fasciatus*. Records were obtained from multiple coastal districts and habitats, including rocky intertidal zones, shallow reefs and nearshore coastal areas. *Istiblennius dussumieri* was the most frequently recorded species and was widely distributed across the study area. The findings provide essential baseline data on the distribution of Blenniidae in Lampung Province, emphasizing the importance of targeted surveys alongside citizen-science initiatives for documenting cryptic coastal fish diversity in southern Sumatra.

Keywords: Blennioidei, coastal fishes, intertidal zone, Lampung Province, Percomorpha.

Introduction

Indonesia supports one of the world's richest fish faunas, owing to its geographic position and the wide variety of freshwater, coastal and marine habitats it encompasses (Kottelat *et al.* 1993; Kuitert & Tonozuka 2003; Arifah *et al.* 2025a). More than three thousand marine fish species have been documented from Indonesian waters, inhabiting ecosystems that range from coral reefs and mangroves to rocky intertidal zones and shallow coastal platforms (Tomascik *et al.* 1997; Froese & Pauly 2000). Despite this remarkable diversity, information on fish distribution in Indonesia remains uneven (Iqbal *et al.* 2018a, 2024), as research has largely focused on commercially valuable or visually conspicuous taxa (Iqbal *et al.* 2024a, 2025), while small, cryptic, and habitat-specialized fishes are often overlooked (Hanum *et al.* 2019; Setiawan *et al.* 2018; Setiawan *et al.* 2019).

Combtooth Blennies (Blenniiformes: Blenniidae) represent a diverse family of small, benthic reef-associated fishes widely distributed in tropical and subtropical regions (Patzner *et al.* 2009). They commonly inhabit shallow coastal environments such as rocky shores, tide pools, coral reefs, and

mangrove margins, where they play important ecological roles as algal grazers and small invertebrate predators (Lin & Hastings 2013; Nelson *et al.* 2016). Indonesia supports a particularly high diversity of Blenniiformes species, with more than one hundred species reported across numerous genera, including *Alticus*, *Ecsenius*, *Istiblennius*, *Meiacanthus*, *Omobranchus*, *Phenablennius* and *Salarias* (Froese & Pauly 2000; Patzner *et al.* 2009). However, their cryptic behavior, small body size, and site-attached habits have resulted in frequent underrepresentation in regional ichthyofaunal inventories (Arisuryanti *et al.* 2024; Moore *et al.* 2025).

Lampung Province, situated at the southern tip of Sumatra and bordering both the Sunda Strait and the Indian Ocean, encompasses a wide range of coastal habitats suitable for diverse fish assemblages, including combtooth blennies, such as rocky intertidal zones, shallow reefs, and nearshore coral communities (Sagala *et al.* 2020; Yuliana *et al.* 2020). Nevertheless, ichthyological studies in this region have largely focused on economically important fishes, leaving reef-associated groups such as Blenniidae poorly documented (Akbar *et al.* 2025). Here, we present preliminary records of combtooth blennies from Lampung Province, providing baseline distributional data and highlighting the need for more comprehensive surveys of cryptic coastal fishes in southern Sumatra.

Methods

Study area

Field observations were conducted along selected coastal sites in Lampung Province, southern Sumatra, Indonesia. this Province covers an area of 35,288.35 km² and is located between 103°48'–105°45' E and 3°45'–6°45' S, bordered by the Indian Ocean to the west, the Java Sea to the east, South Sumatra and Bengkulu Provinces to the north, and the Sunda Strait to the south (BPS Lampung 2021). Surveys focused on rocky intertidal zones, shallow reef flats, and nearshore coral or coral-rubble habitats exposed during low tide, which represent typical environments occupied by combtooth blennies (Blenniidae). Geographic coordinates and basic habitat descriptions were recorded for each observation site (Table 1, Fig. 1).

Two dedicated field visits were conducted to document Combtooth Blennies in Lampung Province. The first survey was carried out on 27 and 28 November 2017 at Laguna Gayau (Gayau Lagoon) and Teluk Kiluan (Kiluan Beach), both administratively located in Tanggamus District. These sites are characterized by rocky shorelines, tide pools, and wave exposed intertidal habitats. The second survey was conducted on 6 November 2025 at Muara Indah Suak Beach, Lampung Selatan District, an area dominated by shallow coastal habitats with mixed sandy and reef substrates.

Species identification

Combtooth blennies were documented through visual surveys conducted during low tide and opportunistic shallow-water fishing activities, with individuals recorded in situ and photographed to capture diagnostic external morphological features. No specimens were collected or preserved for deposition in museum collections. Individual fish were briefly handled to examine morphological characters and to obtain photographic documentation, after which they were released. For each observation, data on habitat type, tidal conditions, and microhabitat use (e.g., rock crevices, tide pools, and exposed reef surfaces) were recorded, with photographic documentation serving as voucher evidence and the primary basis for species identification. In addition to field observations, supplementary occurrence data were obtained from iNaturalist (2026), one of the largest global citizen science biodiversity platforms, to improve spatial coverage and include areas not directly surveyed.

Records of Blenniidae from Lampung Province and adjacent coastal regions were reviewed, with only observations supported by clear photographic evidence and identified to species or genus level being included. Species identification was based on external morphological characters visible in photographs, including body shape, coloration patterns, fin morphology, and head markings. Identifications were cross-checked using relevant fish taxonomic literature (Kuitert & Debelius 1994; Allen 2004; Randall 2005; Iqbal *et al.* 2018b). For iNaturalist derived records, identifications were further evaluated by examining community consensus and expert level annotations when available, and records lacking sufficient diagnostic characters were conservatively assigned to genus level.

Data analysis

All confirmed records from both field observations and iNaturalist were compiled to produce a preliminary species list for Lampung Province. We followed Iqbal *et al.* (2024a) and Arifah *et al.* (2025b) by applying a descriptive, occurrence-based approach that integrates field observations with

citizen science data to summarize species composition and distributional patterns. This study provides baseline occurrence data and demonstrates the methodological value of combining field surveys and citizen science for documenting cryptic coastal fishes.

Results and Discussion

A total of seven taxa of Combtooth Blennies (Blenniiformes: Blenniidae) representing five genera were recorded from coastal habitats in Lampung Province, southern Sumatra (Table 1). The recorded taxa include *Alticus saliens*, *Aspidontus taeniatus*, *Entomacrodus vermiculatus*, *Istiblennius* sp., *Istiblennius dussumieri*, *Salarias* sp. and *Salarias fasciatus* (Fig. 1). Observations were documented from multiple coastal districts, including Pesisir Barat, Lampung Selatan, Pesawaran, and Tanggamus, indicating a wide distribution of Combtooth Blennies fishes across the province (Fig. 2).

Table 1. Summary of Combtooth Blennies (Blenniiformes: Blenniidae) found in Lampung Province, southern Sumatra, Indonesia. Note after species name, refer to sources or observers: iN (iNaturalist), GAW (Gusti Ayu Widayanti), MI (Muhammad Iqbal), IA (Ina Aprillia), DDP (Delon Dian Putra), AS (Aulia Salsabila), NA (Nur Arifah), MA (Muhammad Aflah) and AK (Ayu Karlina).

No.	Species	Date	Location	Cordinates
1	<i>Istiblennius</i> sp. (iN)	28 Jan 2024	Tembakak Way Sidi, Pesisir Barat	5°06'S, 103°52'E
2	<i>Istiblennius dussumieri</i> (iN)	18 Apr 2017	Krui, Pesisir Barat	5°18'S, 103°59'E
	<i>I. dussumieri</i> (iN)	3 Feb 2024	Karya Tunggal, Lampung Selatan	5°34'S, 105°22'E
	<i>I. dussumieri</i> (GAW, MI, IA)	27 Nov 2017	Teluk Kiluan, Tanggamus	5°46'S, 105°06'E
	<i>I. dussumieri</i> (DDP, AS, NA, MA, AK)	6 Nov 2025	Muara Indah Suak, Lampung Selatan	5°38'S, 105°27'E
3	<i>Alticus saliens</i> (GAW, MI, IA)	28 Nov 2017	Laguna Gayau, Tanggamus	5°46'S, 105°06'E
4	<i>Salarias</i> sp. (iN)	3 Feb 2024	Bangun Rejo, Pesawaran	5°44'S, 105°09'E
5	<i>Salarias fasciatus</i> (iN)	3 Feb 2024	Gebang, Pesawaran	5°34'S, 105°13'E
	<i>S. fasciatus</i> (DDP, AS, NA, MA, AK)	6 Nov 2025	Muara Indah Suak, Lampung Selatan	5°38'S, 105°27'E
6	<i>Entomacrodus vermiculatus</i> (iN)	3 Feb 2024	Gebang, Pesawaran	5°34'S, 105°14'E
7	<i>Aspidontus taeniatus</i> (iN)	12 May 2025	Krakatau, Lampung Selatan	6°06'S, 105°25'E



Figure 1. Combtooth Blennies from Lampung Province: 1a. *Istiblennius dussumieri* (Teluk Kiluan); 1b. collected specimen of *Alticus saliens* (Laguna Gayau); 1c. live specimen of *A. saliens* (Laguna Gayau); and 1d. *Salarias fasciatus* (Muara Indah Suak). Photographs: Muhammad Iqbal and Delon Dian Putra.

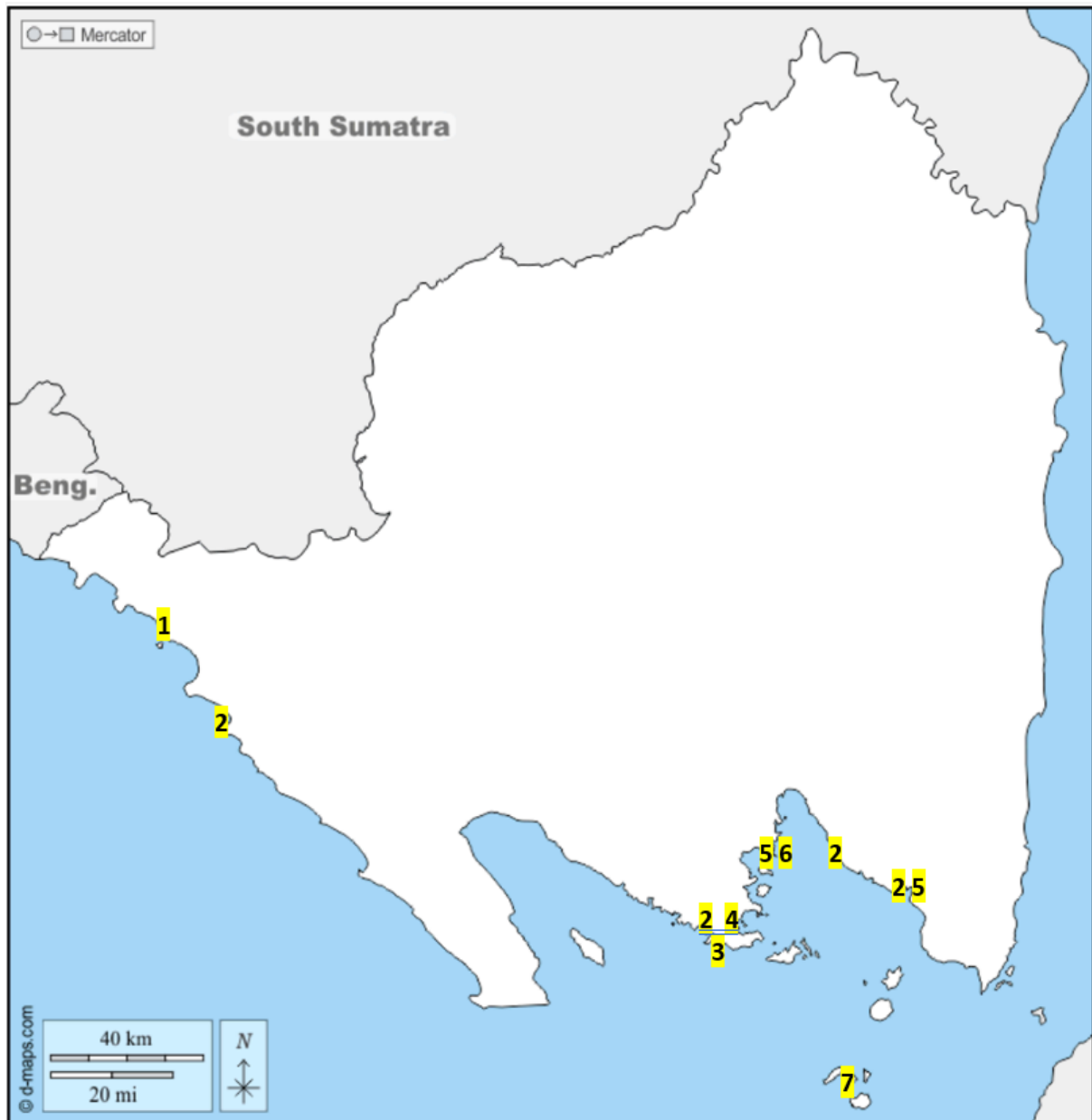


Figure 2. Map of Lampung Province showing the distribution of combtooth blennies (Blenniidae). Numbers on the map correspond to species listed in Table 1.

Among the recorded species, *Istiblennius dussumieri* was the most frequently observed taxon, with records from five localities spanning the western and southern coasts of Lampung between 2017 and 2025. This species is widely distributed and locally abundant throughout the Indo-West Pacific (Froese & Pauly 2000; Arndt & Fricke 2019; Fricke *et al.* 2024). Other species were recorded less frequently, often from single or few localities, including *Aspidontus taeniatus* from the Krakatau area and *Alticus saliens* from Laguna Gayau, Tanggamus. Most observations were made in rocky intertidal zones, shallow reefs and nearshore habitats (Fig. 3 and 4).

Records were assembled using a combination of field observations conducted by multiple observers and verified photographic evidence submitted to the iNaturalist platform over the period 2017–2025 (iNaturalist 2025). The extended temporal span of these data demonstrates the long-term persistence of Combtooth Blennies in the coastal waters of Lampung Province and provides important baseline information on their regional distribution; however, further assessment is needed to determine whether habitats at Teluk Kiluan and Laguna Gayau have experienced degradation over time, which could affect the status of these functionally intact ecosystems. Collectively, the records indicate that Lampung supports a taxonomically and ecologically diverse assemblage of Blenniidae, encompassing strictly intertidal species, reef-associated forms and semi-terrestrial taxa adapted to exposed coastal habitats.



Figure 3. The rocky shorelines of Laguna Gayau or Gayau Lagoon in Tanggamus District. This habitat is a typical habitat of *Alticus saliens* (Photograph: Muhammad Iqbal).



Figure 4. The intertidal shallow reef habitats of Muara Indah Suak, Lampung Selatan District, represent typical environments occupied by *Istiblennius dussumieri* and *Salarias fasciatus* (Photograph: Muhammad Iqbal).

The repeated documentation of *Istiblennius dussumieri* across numerous localities and survey periods suggests that this species represents a common and broadly distributed component of Lampung's coastal fish fauna. This pattern is consistent with its well-documented ecological preference for exposed rocky shores and intertidal habitats, where it often occurs in relatively high local abundance. Overall, these findings highlight the complementary value of integrating targeted field surveys with citizen science-based observations in documenting the diversity and spatial distribution of cryptic coastal fishes. They further emphasize the importance of continued, standardized, and long-term monitoring efforts to improve assessments of population dynamics, biogeographic patterns, and conservation status of combtooth blennies in the region.

The occurrence of *Alticus saliens* and *Entomacrodus vermiculatus* further highlights the presence of exposed intertidal environments along the Lampung coastline. Both species are characteristically associated with wave-exposed rocky substrates, where strong hydrodynamic conditions and periodic emersion shape highly specialized ecological niches (Myers 1991; Fricke *et al.* 2024). Their presence suggests that these dynamic habitats remain available and functionally intact in parts of the study area.

Despite its distinctive semi-terrestrial behavior and broad Indo-Pacific distribution, *Alticus saliens* remains classified as Data Deficient (Williams 2014). This status reflects a lack of comprehensive information on its population size, distributional continuity, and long-term trends, rather than evidence of rarity or decline. This species is often overlooked in conventional reef-fish surveys due to its occupation of marginal intertidal habitats, cryptic behavior, and its ability to move rapidly between crevices when disturbed, including prolonged periods spent out of water (Myers 1991). As a result, available records are sparse and geographically fragmented, with only approximately eight records reported from Indonesia (GBIF 2025). The present documentation from Lampung contributes valuable baseline data toward resolving this knowledge gap, underscoring the need for targeted intertidal surveys and standardized monitoring to better assess the conservation status of this species. In addition, the record of *Aspidontus taeniatus*, a well-known reef-associated mimic species (Kuwamura *et al.* 2022), indicates the availability of suitable coral or coral-rubble habitats, particularly in offshore or island settings such as the Krakatau area. The ecological roles of the recorded species vary considerably. *Aspidontus taeniatus* exhibits aggressive mimicry of the cleaner wrasse *Labroides dimidiatus*, allowing it to approach reef fishes and feed on fins or mucus, thereby increasing feeding success while reducing predation risk (Randall & Randall 1960; Côté & Cheney 2004). In contrast, *A. saliens* is classified as Data Deficient and, despite its amphibious lifestyle in intertidal habitats and potential role in linking marine and semi-terrestrial food webs, remains poorly studied, highlighting the need for further research (Ord & Cooke 2016). Studies on fish diversity have been conducted in the waters of the Krakatau Islands; however, species-level information remains limited (Sari 2018; Muwarni 2019). Together, these findings emphasize the ecological heterogeneity of Lampung's coastal systems and highlight the importance of incorporating intertidal and cryptic taxa into regional biodiversity assessments.

Although only seven taxa were recorded, this number likely underestimates the true diversity of Blenniidae in Lampung Province. Combtooth Blennies are small, cryptic, and often overlooked in general ichthyofaunal surveys that focus on larger or commercially important fishes (Egan *et al.* 2021). The integration of opportunistic field observations with citizen-science data proved effective in documenting species occurrences and extending known local distributions. These preliminary records emphasize the need for more systematic and targeted surveys of cryptic coastal fishes in southern Sumatra to better assess regional fish diversity and distribution patterns.

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