Check List the journal of biodiversity data
NOTES ON GEOGRAPHIC DISTRIBUTION

# First records of *Hypoatherina temminckii* (Bleeker, 1854), Samoan Silverside (Atheriniformes, Atherinidae), from Bidong Island, Terengganu, Malaysia

**Daichi Sasaki**[1], **Ying Giat Seah**[2,3], **Seishi Kimura**[4]

1 Mie Prefecture Fisheries Research Institute, 3564-3 Hamajima, Hamajima-cho, Shima, Mie, Japan
2 Faculty of Fisheries and Aquaculture Sciences, Universiti Malaysia Terengganu, Kuala Nerus, Terengganu, Malaysia
3 Repository and Reference Centre (RRC-UMT), Universiti Malaysia Terengganu, Kuala Nerus, Terengganu, Malaysia
4 Graduate School of Bioresources, Mie University, 1577 Kurimamachiya-cho, Tsu, Mie, Japan

Corresponding author: Ying Giat Seah (ygseah@umt.edu.my)

**Abstract.** Twelve specimens of *Hypoatherina temminckii* (Bleeker, 1854) were collected from Bidong Island, off Terengganu in the southern South China Sea in July 2025. They represent the first report of this species from Malaysia, although the species is widely distributed in the Indo-West Pacific. Morphometric and meristic characters are described herein. *Hypoatherina temminckii* is distinguished by having body depth 13–19% of the standard length (SL), caudal-peduncle depth 5.7–7.6% of SL, the anus posterior to the pelvic-fin tip, the pectoral-fin axillary scale elongated posteriorly, vertebrae 39–43, midlateral scales 38–42, and a narrow interorbital width, 29–39% of the head length.

**Key words.** Geographic distribution, marine fish, new record, Peninsular Malaysia, Silverside, South China Sea

**Sasaki D, Seah YG, Kimura S** (2026) First records of *Hypoatherina temminckii* (Bleeker, 1854), Samoan Silverside (Atheriniformes, Atherinidae), from Bidong Island, Terengganu, Malaysia. Check List 22 (2): 211–216. https://doi.org/10.15560/22.2.211

## Introduction

The four species of atherinids (order Atheriniformes, family Atherinidae) are known from Malaysian waters, namely *Atherinomorus lacunosus* (Forster, 1801), *Atherinomorus pinguis* (Lacepède, 1803), *Doboatherina aetholepis* (Kimura, Iwatsuki & Yoshino, 2002), and *Doboatherina valenciennei* (Bleeker, 1854) (Kimura 2011; Sasaki and Kimura 2019). In July 2025, atherinid specimens were collected from the west coast of Bidong Island, off Terengganu, Peninsular Malaysia. Based on these specimens, we document the occurrence of *Hypoatherina temminckii* (Bleeker, 1854), a first record in Malaysian waters. The genus *Hypoatherina* Schultz, 1948 is widely distributed in Indo-Pacific region and is characterised by the following combinations of characteristics: ascending process of premaxilla long and slender, its height more than 2.7 times the maximum width; anterior and posterior lateral processes of premaxilla narrow and deep, anterior process almost equal to or slightly deeper than posterior process; premaxilla not tapering posteriorly; posterior upper margin of dentary with a prominent process; upper posterior limb of dentary with rounded or with somewhat angular posteroventral corner; anterior preopercular ridge with a deep notch just above corner; anus posterior to, or slightly anterior to, appressed pelvic-fin tip in adults; dorsoventral height of exposed area in midlateral scale (third) row large, almost equal to maximum height of scale and almost same height as scales just above or below midlateral row (Sasaki and Kimura 2014). The genus is composed of 10 valid species (Sasaki and Kimura 2014), but it has not been recorded in Malaysian waters. Here, we provide a detailed description of *H. temminckii* based on the collected 12 specimens; these represent the first records of the species from Malaysia.

## Methods

All specimens were collected using a hand net from Bidong Island, Terengganu, Malaysia, in July 2025 during ichthyological expeditions along the east coast of Peninsular Malaysia. The collection

OPEN ACCESS

Academic editor: Kar-Hoe Loh
Received: 8 December 2025
Accepted: 2 March 2026
Published: 10 March 2026

Copyright © The authors. This is an open-access article distributed under terms of the Creative Commons Attribution License (Attribution 4.0 International – CC BY 4.0)

was performed under the MyABS permit number 600206. Following collection, the specimens were photographed in fresh condition and subsequently fixed in 10% formalin and preserved for long-term storage in 70% ethanol. Meristic counts and proportional measurements follow Sasaki and Kimura (2012, 2014). All measurements of length were made with digital callipers to the nearest 0.01 millimetres. Osteological observations were made from soft x-ray photographs. Cyanine blue was used to easily examine and count scales. Standard and head lengths are abbreviated as SL and HL, respectively. The distribution map was created by plotting our new records as well as data from Sasaki and Kimura (2014) and Kimura (2018) on the digital world map MAPIO WORLD (A&P Coordinator Japan Co., Ltd.). The material listed in this study is deposited in Graduate School of Bioresources, Mie University (FRLM), Japan and the Repository and Reference Centre (RRC-UMT), Universiti Malaysia Terengganu (UMTF), Malaysia.

# Results

Class Actinopterygii
Order Atheriniformes
Family Atherinidae
Genus *Hypoatherina* Schultz, 1948

***Hypoatherina temminckii* (Bleeker, 1854)**
Figure 1

**English name.** Samoan Silverside

**New standard Malay name.** Paku Samoa

**New records.** MALAYSIA — Terengganu • Bidong Island, western coast of Bidong Island; 05°37′15.6″N, 103°03′25.2″E; 14 July 2025; Sasaki D leg.; hand net; 3 spec., 54–57 mm SL, FRLM 66016–66018 • Jeti Pulau Bidong, southwestern coast of Bidong Island; 05°36′46.8″N, 103°03′32.4″E; 15 July 2025; Sasaki D; hand net; 4 spec., 48–58 mm SL, FRLM 66065–66068 • Bidong Island, western coast of Bidong Island; 05°37′15.6″N, 103°03′25.2″E; 16 July 2025; Sasaki D; hand net; 5 spec., 41–55 mm SL, FRLM 66095, FRLM 66104, UMTF 13564–13566.

**Identification.** Body depth 13–19% SL, caudal-peduncle depth 5.7–7.6% SL; ascending process of premaxilla long and slender, its height more than five times in maximum width, but shorter than horizontal length of premaxilla; interorbital width narrow, 29–39% HL; midlateral scales entire or slightly notched; predorsal scale not extending posteriorly; pectoral-fin axillary scale usually elongated posteriorly; anus posterior to appressed pelvic-fin tips in adults; midlateral scales 38–42; total number of vertebrae 39–43 (Sasaki and Kimura 2014; this study).

Meristic counts and proportional measurements are shown in Table 1. Body cylindrical; anterodorsal profile of head and dorsal profile of body from top of head to origin of second dorsal fin almost straight; ventral profile of body slightly convex; head moderately long; snout pointed; mouth inclined obliquely upward; posterior tip of upper jaw reaching to, or slightly anterior to, a vertical through anterior margin of eye; maxilla slanted down posteriorly, with round posterior upper corner;

**Figure 1.** Fresh specimen of *Hypoatherina temminckii*, FRLM 66065, 58 mm standard length, Bidong Island, Terengganu, Malaysia.

**Table 1.** Counts and measurements of *Hypoatherina temminckii* specimens collected from Bidong Island, Terengganu, Malaysia. The values in parentheses indicate mean values.

| | **Present study, *n* = 12** |
|---|---|
| **Standard length (mm)** | **41–58 (52.7)** |
| Counts | |
| 1st dorsal-fin rays | V–VII (6.3) |
| 2nd dorsal-fin rays | I, 8–10 (9.0) |
| Anal-fin rays | I, 11–12(11.4) |
| Pectoral-fin rays | I, 16–19 (17.4) |
| Midlateral scales | 38–40 (39.2) |
| Predorsal scales | 16–17 (16.6) |
| Interdorsal scales | 7–9 (7.9) |
| Gill rakers on lower arch | 21–24 (21.9) |
| Precaudal vertebrae | 22–23 (22.5) |
| Caudal vertebrae | 18–19 (18.3) |
| Total vertebrae | 40–41 (40.8) |
| Midlateral scales between levels of pectoral-fin tip and first dorsal-fin origin | 3.0–5.0 (4.2) |
| **Measurements** | |
| As % of standard length | |
| Head length | 24–26 (24.9) |
| Snout length | 5.4–6.5 (5.9) |
| Upper jaw length | 6.5–7.7 (7.0) |
| Eye diameter | 9.2–10 (9.6) |
| Postorbital length of head | 9.1–11 (10.0) |
| Interorbital width | 8.5–9.8 (9.0) |
| Predorsal length | 50–52 (50.8) |
| Distance between snout and 2nd dorsal-fin origin | 70–73 (71.4) |
| Distance between origins of 1st and 2nd dorsal fins | 20–23 (21.0) |
| Distance between snout and insertion of pectoral fin | 25–26 (25.5) |
| Distance between snout and pectoral-fin tip | 40–44 (41.7) |
| Pectoral-fin length | 15–18 (16.7) |
| Distance between snout and insertion of pelvic fin | 37–39 (37.8) |
| Distance between snout and pelvic-fin tip | 48–51 (49.7) |
| Distance between snout and anus | 51–53 (51.5) |
| Distance between insertion of pelvic fin and anus | 13–15 (14.0) |
| Pelvic-fin length | 11–13 (12.4) |
| Caudal-peduncle length | 17–19 (18.0) |
| Body depth | 15–17 (15.9) |
| Caudal-peduncle depth | 6.2–6.9 (6.5) |
| As % of head length | |
| Snout length | 21–25 (23.6) |
| Upper jaw length | 26–30 (28.1) |
| Eye diameter | 37–41 (38.5) |
| Postorbital length of head | 38–43 (40.1) |
| Interorbital width | 35–39 (36.3) |
| As % of pelvic-fin length | |
| Distance between insertion of pelvic fin and anus | 103–124 (113.3) |
| As % of body depth | |
| Width of midlateral band | 25–29 (26.6) |
| As % of caudal-peduncle depth | |
| Width of midlateral band | 60–69 (64.9) |

ascending process of premaxilla long and slender, both anterior and posterior lateral processes narrow and deep; posterior upper margin of dentary with a prominent dentary process; anterior preopercular ridge with a deep notch just above corner; anus posterior to appressed pelvic-fin tip; dorsoventral height of exposed area in the midlateral scale (third) row large, almost equal to the maximum height of the scale, and almost the same height as scales just above (second) or below (fourth) the midlateral row; small conical teeth in jaws, vomer, basihyal, basibranchial, endopterygoids; tooth band on premaxilla wide, extending to outer surface except on symphysis; tooth band on dentary wide anteriorly; anterior nostril situated dorsolaterally near anterior tip of snout; posterior nostril just anterior to upper margin of eye; six branchiostegal rays; gill rakers long and slender; interorbital space flat. Scales cycloid, large, covering head (deciduous) and body; circumferential scales 14; lateral scales entire; predorsal scale not extending posteriorly; lateral line absent. First dorsal-fin with slender, feeble spines; second dorsal-fin origin posterior to a vertical through the anal-fin origin; caudal fin forked; pelvic fin I, 5. First dorsal-fin originating nearly above anus; second dorsal-fin origin located just above base of fourth anal-fin soft ray.

Colour of fresh specimens: head and body greenish grey dorsally, brilliant silver laterally; dorsal and dorsolateral scale pockets fringed with black; midlateral band glossy indigo blue, with upper margin light green, extending to upper lobe of caudal fin; ventrolateral body with small black dots; no black crescent marking in front of eye; snout and pectoral-fin base blackish; fin membranes hyaline.

**Remarks.** Our specimens share the following diagnostic characters of *H. temminckii* as given by Sasaki and Kimura (2014): body depth 15–17% SL (13–19% SL; Sasaki and Kimura 2014), caudal-peduncle depth 6.2–6.9% SL (5.7–7.6% SL); ascending process of premaxilla long and slender; lateral scales entire; predorsal scale not extending posteriorly; pectoral-fin axillary scale usually elongated posteriorly; anus posterior to appressed pelvic-fin tips; midlateral scales 38–40 (38–42); total number of vertebrae 40–41 (39–43). The interorbital width is slightly greater in our Malaysian specimens than described by Sasaki and Kimura (2014) (35–39% HL vs. 29–38% HL). The morphological characters of our specimens agree well with those of *H. temminckii* as described by Sasaki and Kimura (2014).

# Discussion

*Hypoatherina temminckii* is known from a wide area of the Indo-West Pacific, north to southern Japan, south to Queensland (Australia) and Madagascar, west to the east coast of Africa, and east to Fiji; it does not occur in the Red Sea (Sasaki and Kimura 2014; this study: Figure 2). However, despite this large geographical distribution, the species has not been previously reported from Malaysia (Mohsin and Ambak 1996; Ivantsoff and Crowley 1999; Ambak et al. 2010; Kimura 2011; Sasaki and Kimura 2014; Kimura et al. 2015; Du et al. 2019; Seah et al. 2020, 2021; Sasaki 2021). Maxwell (1921: 23) stated that species of Atherinidae are common all along the coast of Malaysia, and that they are frequently found in estuaries and tidal rivers, but he did not give any specific locality of any atherinid species. Maxwell's description of the family was largely based on Seale's (1909) description of the family recorded in the Philippines, and Seale (1909) wrote that the most common species there is *Atherina* (now *Hypoatherina*) *temmincki*. Probably in response to this, Maxwell (1921: 77) listed *H. temminckii* (as *Atherina*) in his book on Malayan fishes. Fowler (1938) also included *H. temminckii* among the fishes of Malaya, and also with unspecified locality. Therefore, our specimens from Bidong Island are the first confirmed records of this species from Malaysia.

*Hypoatherina temminckii* is most similar to *Hypoatherina gobio* (Klunzinger, 1884), *H. tropicalis* (Whitley, 1948), *H. tsurugae* (Jordan & Starks, 1901), and *H. uisila* (Jordan & Seale, 1906). *Hypoatherina temminckii* differs from *H. tsurugae* in having fewer vertebrae (39–43 vs. 43–47 in *H. tsurugae*) and midlateral scales (38–42 vs. 42–46), and in having the pectoral-fin axillary scale extending posteriorly (vs. usually not extending). *Hypoatherina temminckii* differs from *H. uisila* in having fewer midlateral scales (38–42 vs. 41–44 in *H. uisila*), the pectoral-fin axillary scale extending but not lanceolate in shape (vs. lanceolate), and a comparatively deeper body (body depth 13–19% SL vs. 12–16% SL; caudal-peduncle depth 5.7–7.6% SL vs. 4.9–6.3% SL), and it differs from *H. tropicalis* in having a long, slender ascending process of the premaxilla, its height more than 5 times in maximum width (vs. slightly shorter and blunt, its height less than 3 times in maximum width), and fewer predorsal scales (16–18 vs. 18–20) and total vertebrae (39–43 vs. 43–44) (Sasaki and Kimura 2014; this study). Sasaki and Kimura (2014) suggested that it is almost impossible to distinguish *H. temminckii* from *H. gobio* by their

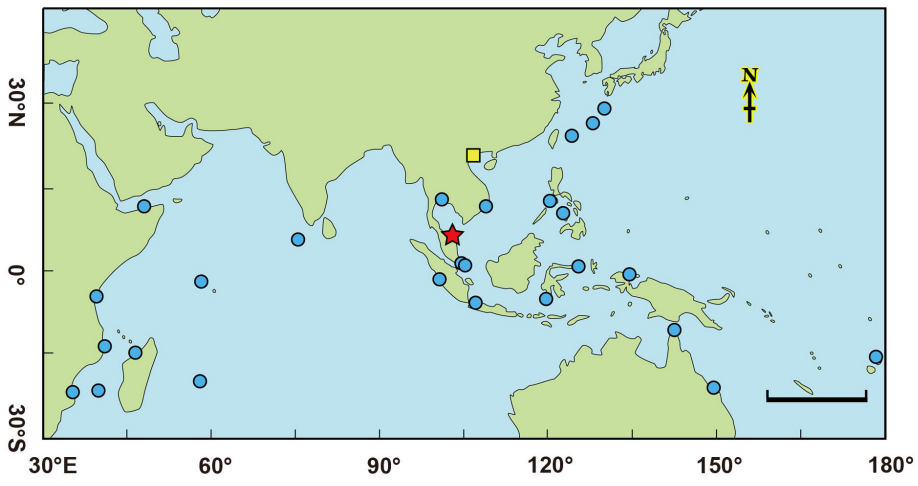


**Figure 2.** Distributional map of *Hypoatherina temminckii*. Red star indicates the new record from Malaysia, blue circles and yellow square indicate distributional records of Sasaki and Kimura (2014) and Kimura (2018), respectively. Scale bar indicates 2,000 km at the equator.

external morphology but that they are clearly shown to be distinct by molecular analysis. *Hypoatherina temminckii* has a somewhat angular posteroventral corner on the upper posterior limb of the dentary (vs. rounded in *H. gobio*), somewhat fewer lower gill rakers (19–25 vs. 22–26), 2.5–6.5 midlateral scales between the pectoral-fin tip and the first dorsal-fin origin (vs. 4.5–7), and a longer pectoral fin (15–20% SL vs. 14–18% SL). These characteristics distinguish this species from congeners.


# Acknowledgements

We are deeply indebted to H. Motomura (KAUM), M. Nakae (NSMT), and all members of Bidong Island Ichthyological Expeditions for their cooperation in field collections. The collection was done under the MyABS permit number 600206 together with the research approvals from Kelantan State Economic Planning Unit, Terengganu State Economic Planning Unit, Pahang State Biodiversity Council and Johor State Economic Planning Division. We wish to acknowledge the support and facilities provided by Universiti Malaysia Terengganu and South China Sea Repository and Reference Centre.


# Additional information

**Conflict of interest**

The authors declare that no competing interests exist.

**Ethical statement**

No ethical statement is reported.


**Funding**

This study was supported by the Universiti Malaysia Terengganu (UMT) through a Strategic Research Grant (UMT/SRG/2023/55435).


**Author contributions**

Conceptualization: DS. Formal analysis: DS, SK. Funding acquisition: DS, YGS, SK. Investigation: DS, YGS, SK. Methodology: DS. Resources: DS, YGS, SK. Writing – original draft: DS, SK. Writing – review and editing: DS, YGS, SK.


**Author ORCID iDs**

Daichi Sasaki https://orcid.org/0009-0005-4670-0269
Ying Giat Seah https://orcid.org/0000-0002-2976-4448
Seishi Kimura https://orcid.org/0000-0001-6844-5864


**Data availability**

All data that support the findings of this study are available in the main text.

# References


**Ambak MZ, Isa MM, Zakaria MZ, Ghaffar MA** (2010) Fishes of Malaysia. Universiti Malaysia Terengganu, Kuala Terengganu, Malaysia, xii+334 pp.

**Du J, Loh K-H, Hu W, Zheng X** (2019) Common reef fishes of Terengganu, Malaysia. Science Press, Beijing, China, 196 pp.

**Fowler HW** (1938) A list of the fishes known from Malaya. Fisheries Bulletin 1: 5–268 + i–lvi.

**Ivantsoff W, Crowley LELM** (1999) Atherinidae (Silversides [or hardyheads]). In: Carpenter K, Niem VH (Eds.) FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific. Vol. 4. Bony fishes, part 2 (Mugilidae to Carangidae). Food and Agriculture Organization, Rome, Italy, 2113–2139.

**Kimura S** (2011) Atherinidae (Silversides). In: Matsunuma M, Motomura H, Matsuura K, Shazili NAM, Ambak MA (Eds.) Fishes of Terengganu-east coast of Malay Peninsula Malaysia. National Museum of Nature and Science, Tokyo, Japan, Universiti Malaysia Terengganu, Kuala Terengganu, Malaysia, and Kagoshima University Museum, Kagoshima, Japan, 52–53.

**Kimura S** (2018) Atherinidae. In: Kimura S, Imamura H, Nguyen VQ, Pham TD (Eds.) Fishes of Ha Long Bay, the natural world heritage site in northern Vietnam. Fisheries Research Laboratory, Mie University, Shima, Japan, 68–70.

**Kimura S, Arshad A, Imamura H, Ghaffar MA** (2015) Fishes of the northwestern Johor Strait, Peninsular Malaysia. Universiti Putra Malaysia Press, Serdang, Malaysia and Mie University, Tsu, Japan, viii + 108 pp.

**Maxwell CN** (1921) Malayan fishes. Methodist Publishing House, Singapore, 104 + ii pp., 72 pls.

**Mohsin AKM, Ambak MA** (1996) Marine fishes & fisheries of Malaysia and neighbouring countries. Univesiti Pertanian Malaysia Press, Serdang, Malaysia, xxxvi + 746 pp.

**Sasaki D** (2021) Atherinidae. In: Motomura H, Kimura S, Seah YG, Sheikh Abdul Kadir ST, Ghaffar MA (Eds.) Reef and shore fishes of Bidong Island, off east coast of Malay Peninsula. The Kagoshima University Museum, Kagoshima, Japan, 17.

**Sasaki D, Kimura S** (2012) Two new silversides, *Hypoatherina celebesensis* and *Hypoatherina macrophthalma*, from the West Pacific (Atheriniformes: Atherinidae). Ichthyological Research 59: 347–353. https://doi.org/10.1007/s10228-012-0299-6

**Sasaki D, Kimura S** (2014) Taxonomic review of the genus *Hypoatherina* Schultz 1948 (Atheriniformes: Atherinidae). Ichthyological Research 61: 207–241. https://doi.org/10.1007/s10228-014-0391-1

**Sasaki D, Kimura S** (2019) A new atherinomorine genus *Doboatherina* (Atheriniformes: Atherinidae) with a review of included species. Ichthyological Research 67: 225–261. https://doi.org/10.1007/s10228-019-00718-5

**Seah YG, Mat Jaafar TNA, Ali MS** (2020) Field guide to trawl fishes near Bidong Island. Universiti Malaysia Terengganu, Kuala Nerus, Malaysia, 144 pp.

**Seah YG, Ali MS, Ghaffar MA, Mat Jaafar TNA** (2021) Marine fishes of Kuantan: Malaysia Biodiversity Information System (MYBIS). Universiti Malaysia Terengganu, Kuala Nerus, Malaysia, xi + 172 pp.

**Seale A** (1909) The fishery resources of the Philippine Islands. Part I, commercial fishes. The Philippine Journal of Science 3 (Sec A): 513–531.