

UPDATED ASSESSMENT OF FISH DIVERSITY IN JADA BAHRIN RIVER, BANGKA ISLAND, INDONESIA

PEMUTAKHIRAN KEANEKARAGAMAN IKAN DI SUNGAI JADA BAHRIN, PULAU BANGKA, INDONESIA

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Abstract

Freshwater fish communities on small tropical islands are important components of regional biodiversity, particularly where rivers provide habitat for species with restricted geographic distributions. Jada Bahrin River on Bangka Island is known to support a diverse assemblage of freshwater fishes, but periodic reassessment is needed to document its current composition. This study aimed to provide an updated inventory of freshwater fishes inhabiting Jada Bahrin River and to identify species of native and conservation relevance. Fish observations and collections were conducted in the river system, followed by taxonomic identification based on available morphological characteristics. The current survey recorded 23 unique fish taxa representing a diverse assemblage of freshwater fishes. The recorded community included *Parosphromenus deissneri*, *Betta chloropharynx*, *B. edithae*, *B. schalleri*, *Rasbora bankanensis*, *R. einthoveni*, *R. cephalotaenia*, *Trichopodus trichopterus*, *Nandus nebulosus*, *Luciocephalus pulcher*, *Belontia hasselti*, *Pristolepis fasciata*, *Anabas testudineus*, *Channa lucius*, *C. striata*, *Ompok sp.*, *Kryptopterus sp.*, *Silurichthys sp.*, *Hemirhamphodon pogonognathus*, *Barbodes sellifer*, *B. lateristriga*, *Osteochilus spilurus*, and *O. vittatus*. The occurrence of *P. deissneri* and several *Betta* species highlights the importance of Jada Bahrin as habitat for freshwater fishes with notable conservation and biogeographic significance. The presence of taxa identified only to genus level also indicates the need for further taxonomic verification, potentially through molecular approaches. Comparison with earlier records suggests that continued field surveys are important for capturing temporal and spatial variation in the local fish assemblage. The findings provide an updated baseline for freshwater fish diversity in Jada Bahrin River and support the need for continued biodiversity monitoring and habitat conservation on Bangka Island.

Keyword: freshwater fish; fish diversity; Jada Bahrin River; Bangka Island; native fish; endemic fish; biodiversity conservation

Abstrak

Ekosistem air tawar pada pulau-pulau tropis memiliki peranan penting dalam mempertahankan keanekaragaman hayati, terutama karena sungai dapat menjadi habitat bagi ikan dengan wilayah persebaran yang terbatas. Sungai Jada Bahrin di Pulau Bangka merupakan salah satu habitat yang mendukung komunitas ikan air tawar yang beragam, tetapi pemutakhiran data secara berkala diperlukan untuk mengetahui kondisi terkini komposisi ikan. Penelitian ini bertujuan untuk memperbarui inventarisasi keanekaragaman ikan air tawar di Sungai Jada Bahrin serta mengidentifikasi keberadaan ikan lokal dan spesies yang memiliki nilai konservasi. Pengamatan dan pengambilan sampel ikan dilakukan pada sistem perairan Sungai Jada Bahrin, kemudian identifikasi dilakukan berdasarkan karakter morfologi yang tersedia. Hasil penelitian mencatat 23 taksa ikan unik yang menunjukkan komunitas ikan air tawar yang beragam. Ikan yang ditemukan meliputi *Parosphromenus deissneri*, *Betta chloropharynx*, *B. edithae*, *B. schalleri*, *Rasbora bankanensis*, *R. einthoveni*, *R. cephalotaenia*, *Trichopodus trichopterus*, *Nandus nebulosus*, *Luciocephalus pulcher*, *Belontia hasselti*, *Pristolepis fasciata*, *Anabas testudineus*, *Channa lucius*, *C. striata*,

Ompok sp., *Kryptopterus* sp., *Silurichthys* sp., *Hemirhamphodon pogonognathus*, *Barbodes sellifer*, *B lateristriga*, *Osteochilus spilurus*, dan *O. vittatus*. Keberadaan *P. deissneri* dan beberapa spesies *Betta* menunjukkan pentingnya Sungai Jada Bahrin sebagai habitat ikan air tawar yang memiliki nilai konservasi dan biogeografi. Ditemukannya beberapa taksa yang masih teridentifikasi pada tingkat genus juga menunjukkan perlunya verifikasi taksonomi lebih lanjut, terutama melalui pendekatan molekuler. Perbandingan dengan catatan penelitian terdahulu menunjukkan pentingnya survei berkelanjutan untuk menangkap variasi spasial dan temporal dalam komunitas ikan. Hasil penelitian ini menyediakan data dasar terbaru mengenai keanekaragaman ikan air tawar di Sungai Jada Bahrin dan dapat mendukung kegiatan pemantauan biodiversitas serta upaya konservasi habitat ikan air tawar di Pulau Bangka.

Kata Kunci: ikan air tawar; keanekaragaman ikan; Sungai Jada Bahrin; Pulau Bangka; ikan lokal; ikan endemik; konservasi biodiversitas

INTRODUCTION

Freshwater fishes in Southeast Asia are characterized by high taxonomic and ecological diversity, with many species having relatively restricted geographic distributions (Zhou & Li, 2022). The Sundaland region is particularly important for freshwater biodiversity because its complex geological history and repeated changes in land connectivity have shaped distinct fish assemblages across mainland and island ecosystems. Restricted distributions can increase the conservation importance of individual freshwater habitats, particularly on islands where opportunities for natural dispersal may be limited. At the same time, freshwater ecosystems throughout the region are increasingly affected by human activities, emphasizing the need for reliable and updated biodiversity information (Dudgeon & Strayer, 2025).

Bangka Island, part of the Sunda Shelf, supports a distinctive freshwater fish fauna associated with rivers, streams, wetlands, and peat-influenced habitats (Subriyono et al., 2025). Several freshwater fishes occurring on the island have restricted distributions and are of particular conservation interest. Members of the genera *Betta* and *Parosphromenus*, for example, are commonly associated with shallow, acidic, and vegetation-rich freshwater environments. Such ecological characteristics make small freshwater habitats potentially important for maintaining native fish populations. Therefore, documenting fish communities at the local scale is essential for identifying freshwater habitats with significant biological and conservation value (Piczak et al., 2023).

Freshwater ecosystems on Bangka Island are increasingly exposed to pressures associated with mining, agricultural expansion, settlement development, vegetation removal, and other forms of land-use change. These activities can modify aquatic habitats through changes in runoff, sedimentation, water chemistry, and riparian vegetation. Such changes may have

greater consequences for fishes with specialized habitat requirements or restricted geographic ranges. *Parosphromenus deissneri*, for instance, is restricted to Bangka Island and has been recognized as a species of conservation concern (Valen et al., 2024). Maintaining up-to-date information on freshwater fish communities is therefore important for assessing biodiversity and supporting appropriate conservation priorities.

Jada Bahrin River is one of the freshwater systems on Bangka Island that has received attention because of its fish fauna. Previous research has documented freshwater fishes in this area, including *Betta schalleri* (Lindiatika et al., 2024). These studies provide an important baseline for understanding the local fish community and demonstrate the ecological relevance of Jada Bahrin. However, available information remains limited in terms of temporal coverage and may not fully represent the current composition of the fish assemblage.

Fish communities can vary among sampling periods because of seasonal changes in water level, habitat conditions, fish movement, reproductive cycles, and differences in sampling locations and collection methods. Consequently, a single survey may fail to detect species that occur at low abundance, have localized distributions, or use habitats that are not adequately sampled. Repeated biodiversity assessments are therefore necessary to improve species inventories and provide a more reliable representation of freshwater fish communities. This is particularly relevant for island ecosystems, where habitat modification and restricted species distributions may increase the vulnerability of native fish populations.

Despite the ecological importance of Jada Bahrin River, an updated assessment of its freshwater fish assemblage is still needed. In particular, current information is required to determine whether the composition of the fish community remains consistent with previous

records and to identify taxa that may require greater conservation attention. Such information

can also provide a contemporary baseline for future biodiversity monitoring and facilitate comparisons with subsequent surveys (Akbar & Kurniawan, 2025).

Therefore, this study aimed to update the inventory of freshwater fishes in Jada Bahrin River, Bangka Island, Indonesia. Specifically, the study assessed the current taxonomic composition of the fish assemblage and documented the occurrence of native and conservation-relevant taxa. The updated inventory is expected to provide baseline information for future biodiversity monitoring and freshwater fish conservation on Bangka Island.

MATERIALS AND METHODS

2.1 Study Area and Sampling Period

The study was conducted in Jada Bahrin River, Bangka Island, Bangka Belitung Islands Province, Indonesia. Fish sampling was carried out over a six-month period from February to July 2026. The extended sampling period was

2.2 Fish Sampling

Fish sampling was conducted periodically from February to July 2026 at selected sites along Jada Bahrin River. A combination of fishing gears, including scoop nets, and fish traps, was used to collect fish from different habitat types. Each specimen was photographed and examined for

intended to capture variation in fish occurrence and provide a more representative inventory of the freshwater fish assemblage in the study area.

Sampling sites were selected along the river based on fish occurrence, habitat accessibility, and the representation of available aquatic habitats. The geographic coordinates of the sampling locations were recorded using a Global Positioning System (GPS). General habitat conditions and photographic documentation of the sampling sites and collected specimens were recorded during field activities.

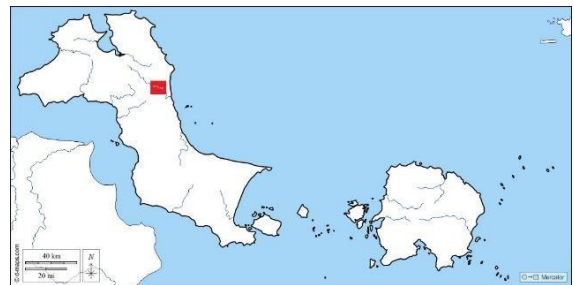


Figure 1. Location of the study area in Jada Bahrin River, Bangka Island, Bangka Belitung Islands Province, Indonesia. The red square indicates the fish sampling location.

morphological characteristics. The number of individuals for each taxon was recorded during each sampling period. Specimens that could not be reliably identified to species level were retained at the genus level and recorded as *Ompok sp.*, and *Kryptopterus sp.*,



Figure 2. Selected fish species recorded from Jada Bahrin River. From left to right: *Parosphromenus deissneri*, *Betta chloropharynx*, *Betta edithae*, *Rasbora bankanensis*, *Osteochilus vittatus*, *Osteochilus spilurus*, *Ompok sp.*, and *Kryptopterus sp.*

2.3 Fish Identification

Fish identification was based on external morphological and meristic characteristics, Identification was conducted using relevant freshwater fish identification guides and taxonomic literature for Bangka Island and the Sundaland region. Scientific names were subsequently checked against current taxonomic references to ensure consistency in nomenclature (Ilmia et al., 2025). When species-level identification could not be confirmed based on the available morphological characters, specimens were retained at the genus level rather than assigning an uncertain species name.

2.4 Data Analysis

Fish data were analyzed descriptively to characterize the current taxonomic composition of the fish assemblage in Jada Bahrin River. The dataset included taxonomic identity and the number of individuals recorded for each taxon during the February–July 2026 sampling period.

The fish inventory was summarized according to family, genus, species, and abundance. Taxa that could not be identified to species level were reported at the genus level. The results were presented in tabular form to provide an updated inventory of freshwater fishes recorded from the study area.

The current species inventory was also compared descriptively with previously published fish records from Jada Bahrin River. The comparison focused on taxa shared between surveys, taxa reported previously but not detected during the current survey, and taxa detected in the present study that were not included in the selected previous inventory.

RESULTS AND DISCUSSION

3.1 Fish Diversity

The survey conducted from February to July 2026 recorded 23 unique fish taxa from Jada Bahrin River, Bangka Island, Indonesia. The recorded assemblage comprised freshwater fishes belonging to several taxonomic groups, indicating that the river supports a heterogeneous fish community. The taxa recorded during the survey were *Parosphromenus deissneri*, *Betta chloropharynx*, *Betta edithae*, *Betta schalleri*, *Rasbora bankanensis*, *Rasbora einthoveni*, *Rasbora cephalotaenia*, *Trichopodus trichopterus*, *Nandus nebulosus*, *Luciocephalus pulcher*, *Belontia hasselti*, *Pristolepis fasciata*, *Anabas testudineus*, *Channa lucius*, *Channa striata*, *Ompok sp.*, *Kryptopterus sp.*, *Silurichthys sp.*, *Hemirhamphodon pogonognathus*, *Barbodes sellifer*, *Barbodes lateristriga*, *Osteochilus spilurus*,

and *Osteochilus vittatus* (Table 1).

Table 1. Fish taxa recorded in Jada Bahrin River during the February–July 2026 survey.

No.	Family	Species/Taxon
1	Osphronemidae	<i>Parosphromenus deissneri</i>
2	Osphronemidae	<i>Betta chloropharynx</i>
3	Osphronemidae	<i>Betta edithae</i>
4	Osphronemidae	<i>Betta schalleri</i>
5	Danionidae	<i>Rasbora bankanensis</i>
6	Danionidae	<i>Rasbora einthoveni</i>
7	Danionidae	<i>Rasbora cephalotaenia</i>
8	Osphronemidae	<i>Trichopodus trichopterus</i>
9	Nandidae	<i>Nandus nebulosus</i>
10	Luciocephalidae	<i>Luciocephalus pulcher</i>
11	Osphronemidae	<i>Belontia hasselti</i>
12	Pristolepididae	<i>Pristolepis fasciata</i>
13	Anabantidae	<i>Anabas testudineus</i>
14	Channidae	<i>Channa lucius</i>
15	Channidae	<i>Channa striata</i>
16	Siluridae	<i>Ompok sp.</i>
17	Siluridae	<i>Kryptopterus sp.</i>
18	Siluridae	<i>Silurichthys sp.</i>
19	Zenarchopteridae	<i>Hemirhamphodon pogonognathus</i>
20	Cyprinidae	<i>Barbodes sellifer</i>
21	Cyprinidae	<i>Barbodes lateristriga</i>
22	Cyprinidae	<i>Osteochilus spilurus</i>
23	Cyprinidae	<i>Osteochilus vittatus</i>

The fish assemblage consisted of species with different ecological characteristics and habitat requirements. The occurrence of cyprinids, labyrinth fishes, snakeheads, catfishes, and other freshwater taxa indicates that Jada Bahrin River provides a variety of aquatic niches. Such taxonomic heterogeneity may reflect differences in water depth, flow conditions, aquatic vegetation, substrate, food availability, and shelter within the river system.

The presence of several species from the family Osphronemidae is particularly noteworthy. *Parosphromenus deissneri*, *Betta chloropharynx*, *B. edithae*, *B. schalleri*, *Trichopodus trichopterus*, and *Belontia hasselti* were recorded during the survey. Members of this group can occupy structurally complex freshwater habitats, particularly shallow waters associated with vegetation and sheltered areas. The occurrence of several taxa within the same river system suggests that Jada Bahrin provides a range of habitat conditions capable of supporting

different ecological strategies.

The cyprinid component of the assemblage, represented by *Rasbora bankanensis*, *R. einthoveni*, *R. cephalotaenia*, *Barbodes sellifer*, *B. lateristriga*, *Osteochilus spilurus*, and *O. vittatus*, further demonstrates the diversity of fish functional groups present in the river. Cyprinids occupy an important position in tropical freshwater ecosystems and may exploit different food resources and microhabitats. Their presence alongside predatory fishes such as *Channa lucius* and *Channa striata* indicates the existence of multiple trophic roles within the fish assemblage.

3.2 Occurrence of Conservation-Relevant Fishes

One of the most important findings of the survey was the occurrence of *Parosphromenus deissneri* and three Betta species, namely *B. chloropharynx*, *B. edithae*, and *B. schalleri*. The occurrence of these taxa increases the conservation and biogeographic significance of Jada Bahrin River because several members of these groups have restricted distributions and strong associations with particular freshwater habitats.

The detection of *P. deissneri* is particularly important in the context of Bangka Island freshwater biodiversity. This species is endemic to Bangka Island and represents one of the distinctive components of the island's native ichthyofauna (Ng & kottelat, 1998). Its continued occurrence in Jada Bahrin indicates that suitable habitat remains available for a species with a geographically restricted distribution.

The presence of Betta species is similarly important. Wild Betta populations are frequently associated with shallow, vegetated, and relatively sheltered freshwater environments. Therefore, the occurrence of *B. chloropharynx*, *B. edithae*, and *B. schalleri* suggests that parts of Jada Bahrin retain habitat characteristics suitable for these fishes (Khanati et al., 2024).

From a conservation perspective, the significance of Jada Bahrin should therefore not be evaluated solely from the number of taxa recorded. The identity, distribution, and ecological requirements of individual species are equally important. A river supporting geographically restricted species may have substantial conservation value even when its total species richness is lower than that of larger river systems.

3.3 Updated Inventory and Comparison with Previous Records

The current survey provides an updated record of fish diversity in Jada Bahrin River. The

detection of 23 unique taxa demonstrates the value of repeated field assessments for documenting freshwater biodiversity on Bangka Island.

Differences between the present inventory and earlier fish records should, however, be interpreted cautiously. The observed composition of a fish community can vary according to sampling season, water level, habitat accessibility, sampling effort, fishing gear, and the detectability of individual species. Species occurring at low abundance or in restricted microhabitats may not be detected during every survey.

Therefore, the absence of a species from the current inventory should not automatically be interpreted as evidence of local extinction. Similarly, the detection of a species that was not previously reported from Jada Bahrin does not necessarily indicate recent colonization. Such differences may instead reflect differences in sampling coverage or temporal variation in fish occurrence.

Nevertheless, repeated surveys remain important because they allow the development of a more comprehensive biodiversity baseline. The six-month sampling period used in this study, combined with multiple fishing gears, provides an opportunity to detect taxa that may be missed during short-term or single-method surveys.

3.4 Taxa Requiring Further Taxonomic Verification.

Three taxa were identified only to the genus level: *Ompok sp.*, *Kryptopterus sp.*, and *Silurichthys sp.* Their inclusion in the inventory demonstrates the presence of additional siluriform diversity in Jada Bahrin, but species-level interpretation remains uncertain.

Further investigation using molecular approaches would therefore be valuable. DNA barcoding, particularly using the mitochondrial cytochrome c oxidase subunit I (COI) gene, could complement morphological identification and help determine the taxonomic identity of these unresolved specimens (Hubert, et al., 2008; Antil et al., 2023). This approach would also be useful for detecting cryptic diversity that may not be readily distinguished using external morphology alone.

CONCLUSION

The survey conducted from February to July 2026 recorded 23 unique fish taxa in Jada Bahrin River, Bangka Island, Indonesia. The fish assemblage comprised a diverse range of freshwater taxa, including *Parosphromenus deissneri*, *Betta chloropharynx*, *B. edithae*, *B. schalleri*, several *Rasbora*, *Barbodes*, and

Osteochilus species, as well as *Channa*, *Ompok*, *Kryptopterus*, and *Silurichthys*. The occurrence of *P. deissneri* and several *Betta* species highlights

the biogeographic and conservation importance of Jada Bahrin River as a habitat for native freshwater fishes of Bangka Island.

The present survey provides an updated baseline of fish diversity in Jada Bahrin River and demonstrates the value of repeated biodiversity assessments using multiple fishing gears. Three taxa, *Ompok* sp., *Kryptopterus* sp., and *Silurichthys* sp., remain unresolved at the species level, indicating the need for further taxonomic verification using an integrative approach, particularly DNA barcoding. Continued monitoring of Jada Bahrin River is recommended to document temporal changes in fish composition and to support the conservation of native and geographically restricted freshwater fishes on Bangka Island.

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