

Preliminary Checklist of the Inshore Fishes (Chondrichthyes and Osteichthyes) of Pukan Beach, Bangka Island, Sumatra

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Abstract

Pukan Beach is gently sloping intertidal sandy shores that have a great potential for tourist and having great number of inshore biodiversity in Bangka Island, Sumatra. A survey to collect information on species diversity of fishes has been conducted on 7 December 2024. The fishes were collected using a hand pulling fishing net as long as 5x7 m, at evening, time ranges between 4.00 p.m to 8.00 p.m. A total of 19 species of fishes from 17 genera and 14 families has been documented from the study site. The genera include *Brevitrygon* (Dasyatidae), *Sardinella* and *Anodontostoma* (Dorosomatidae), *Acentrogobius* (Gobiidae), *Ambassis* (Ambassidae), *Gerres* (Gerreidae), *Terapon* (Terapontidae), *Equulites* and *Leiognathus* (Leiognathidae), *Carangoides* (Carangidae), *Callionymus* (Callionymidae), *Platycephalus* and *Onigocia* (Platycephalidae), *Saurida* (Synodontidae), *Sillago* (Sillaginidae), *Triacanthus* (Triacanthidae) and *Lagocephalus* (Tetraodontidae). This checklist is preliminary checklist of the species of fishes in Pukan Beach.

Keywords: Bangka, coastal, hand pulling fishing net, Karimata Strait, Pes-caprae.

Introduction

Situated between the Indian and Pacific Oceans and between the Asian and Australian continents, the seas of the Indonesian Archipelago are home to a notable amount of marine biodiversity (Sukardjo & Pratiwi 2015; Windusari *et al.* 2019). With a coastline that spans about 1.9 million kilometres, Indonesia is a remarkable maritime nation that plays a vital role in managing its ocean, small islands, and coastal areas (Hutomo & Moosa 2004; Iqbal *et al.* 2024a, b). From Sumatra to the Indonesian Papua islands, the inclination of physical diversity and island sizes is the major driver of the biological diversity of this part of the world through the antipathetic influence of both the connectivity given by the sea and the isolation of the islands (Hoeksema 2007; Serge *et al.* 2022).

Sumatra has about 4,500 km of coastline length (excluding the smaller islands), and its numerous remote islands remain among the least studied with regards to marine biodiversity distribution (Tomascik *et al.* 1997; Pormansyah *et al.* 2019). Six types of ecosystems are found around the coasts of Sumatra, including beach vegetation on accreting coasts (pes-caprae formation), mangrove forests, beach vegetation on abrading coasts (*Barringtonia* formation), brackishwater forests, rocky shores, and coral reefs (Whitten *et al.* 2000). It is widely recognized that ecosystems around the coasts in Sumatra have played an important role as locations for attractions and recreation, including upon which tourism

development (Valeriani & Wardhani 2015).

Bangka Island is the second largest island in Sumatra, with a total area of more than 11,300 km² and is 70 km at its widest (in the south) and approximately 245 km at its longest (Iqbal *et al.* 2012). This island can be essential habitat for many species of flora and fauna in Indonesia (Amrillah *et al.* 2019; Syafutra *et al.* 2018, 2024). Pukan Beach, located on the eastern coast of Bangka Island facing the Karimata Strait, is a coastal area with significant tourism potential and rich inshore biodiversity, characterized by a temperature range of 30-32°C and a pH range of 6.30-6.71, which is considered suitable for aquatic organisms (Saputri *et al.* 2023). Unfortunately, there is no information available for inshore fish diversity in Pukan beach. In this paper, we report a preliminary checklist of the inshore fishes of Pukan Beach of Bangka Island, Sumatra.

Methods

On 7 December 2024, a survey to collect specimens of inshore fishes was conducted in Pukan Beach (2°02'S, 106°09'E), Bangka Island, Sumatra. Administratively, Pukan Beach was situated in Air Anyir Village, Merawang Subdistrict, Bangka District, Bangka Belitung Islands Province, Indonesia (Fig. 1). The stretch of Pukan Beach is approximately 3 km, characterized by a type of gently sloping intertidal sandy shore with a line of pine trees (Coastal she-oak *Casuarina equisetifolia*) along the edge, which, at low tide has a stretch of beach as far as 500-600 m from the coastline.

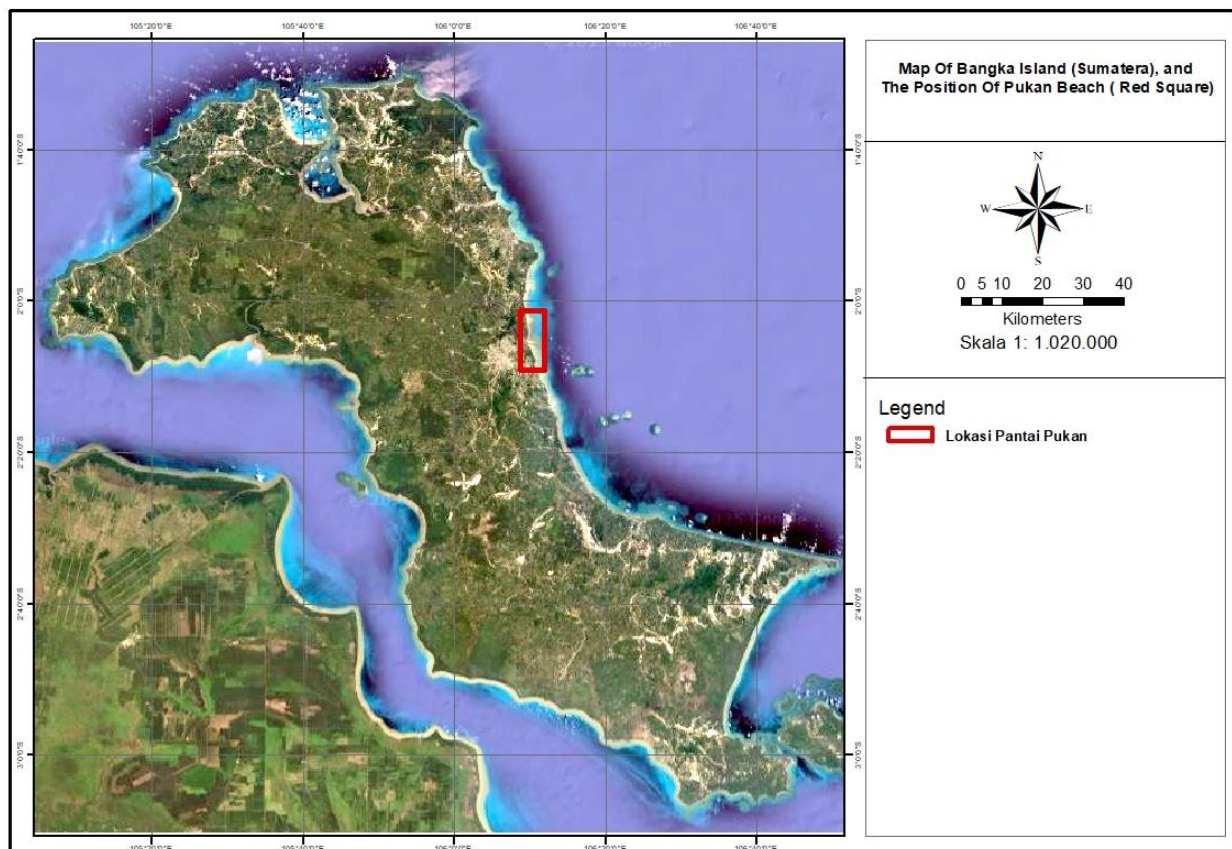


Figure 1. Map of Bangka Island (Sumatra), and the position of Pukan Beach (red square).



Figure 2. The intertidal sandy shores with a line of pine trees (Coastal she-oak *Casuarina equisetifolia*) along the edge of Pukan Beach, Bangka Island, Sumatra (Photograph: Muhammad Iqbal).



Figure 3. The gently sloping intertidal sandy shores and sample collection using traditional hand-pulling fishing nets in Pukan Beach, Bangka Island, Sumatra (Photograph: Muhammad Iqbal).

During our visit to Pukan Beach, we used a hand-pulling fishing net as long as 5x7 m to catch the various fish species (Fig. 3). We conduct five repetitions to collect fish specimens using hand-pulling fishing in the evening; time ranges between 4:00 p.m. to 8:00 p.m. This hand-pulling fishing net is a traditional fishing technique of residents in Bangka Belitung Islands Province, namely by local people “pukat tarik” (Kurniawan *et al.* 2019; Salim *et al.* 2019; Saputra 2019).

The abundances of the species werereviewed by how many individuals of each species were collected during the survey. The following terms therefore refer to a measure of abundance:

- Common: encountered in some numbers, more than 50 individuals
- Frequent: encountered in some numbers, range 21-50 individuals
- Infrequent: rather few records, range 11-20 individuals
- Scarce: rather few records, range 6-10 individuals
- Rare: less than five individuals

Due to our limitation of equipment and permits for collecting samples, no specimen was collected properly during this visit. However, we took some photos of live or fresh specimens for documentation and identification. For identification of the specimens collected, the fishes were determined using various appropriate references (Kottelat *et al.* 1993; Mohsin & Ambak 1996; Kimura & Matsuura 2003; Allen 2024; Larson & Lim 2005; Lim & Low 1998; Rainboth *et al.* 2012; Iqbal *et al.* 2018, 2019). The references above are significant to determine inshore fishes of Bangka Island and its adjacent areas. The abundances of the species were reviewed by how many individuals of each species were collected during the survey.

Results and Discussion

A total of 19 fish species were recorded at Pukan Beach (Table 1, Fig. 4 and 5). Based on local abundance, the species were categorized as follows: three common, three frequent, five infrequent, three scarce, and three rare. The species composition consisted of one Chondrichthyes (*Brevitrygon walga*) and 18 Osteichthyes species.

Table 1. The list of the species of fishes found on 7 December 2024 in Pukan Beach, Air Anyir Village, Merawang Subdistrict, Bangka Island, Sumatra.

No	Species	English Name	Family	Remarks
1	<i>Brevitrygon walga</i>	Dwarf whipray	Dasyatidae	Rare
2	<i>Sardinella lemuru</i>	Bali sardinella	Dorosomatidae	Common
3	<i>Anodontostoma chacunda</i>	Chacunda gizzard shad	Dorosomatidae	Infrequent
4	<i>Acentrogobius caninus</i>	Tropical sand goby	Gobiidae	Scarce
5	<i>Ambassis interrupta</i>	Long-spined glass perchlet	Ambassidae	Infrequent
6	<i>Gerres erythrourus</i>	Deep-bodied mojarra	Gerreidae	Frequent
7	<i>Terapon theraps</i>	Large scaled terapon	Terapontidae	Scarce
8	<i>Equulites leuciscus</i>	Whip fin ponyfish	Leiognathidae	Common
9	<i>Equulites elongatus</i>	Elongate pony fish	Leiognathidae	Common
10	<i>Leiognathus brevirostris</i>	Shortnose ponyfish	Leiognathidae	Frequent
11	<i>Carangoides praeustus</i>	Brownback trevally	Carangidae	Infrequent
12	<i>Callionymus</i> sp.	Dragonet	Callionymidae	Scarce
13	<i>Platycephalus indicus</i>	Bartail flathead	Platycephalidae	Rare
14	<i>Onigocia spinosa</i>	Midget flathead	Platycephalidae	Rare
15	<i>Saurida micropectoralis</i>	Shortfin lizardfish	Synodontidae	Infrequent
16	<i>Sillago Aeolus</i>	Oriental trumpet whiting	Sillaginidae	Frequent
17	<i>Triacanthus nieuhofii</i>	Silver tripodfish	Triacanthidae	Scarce
18	<i>Lagocephalus scleratus</i>	Silver-cheeked toadfish	Tetraodontidae	Rare
19	<i>Lagocephalus spadiceus</i>	Half-smooth golden pufferfish	Tetraodontidae	Rare

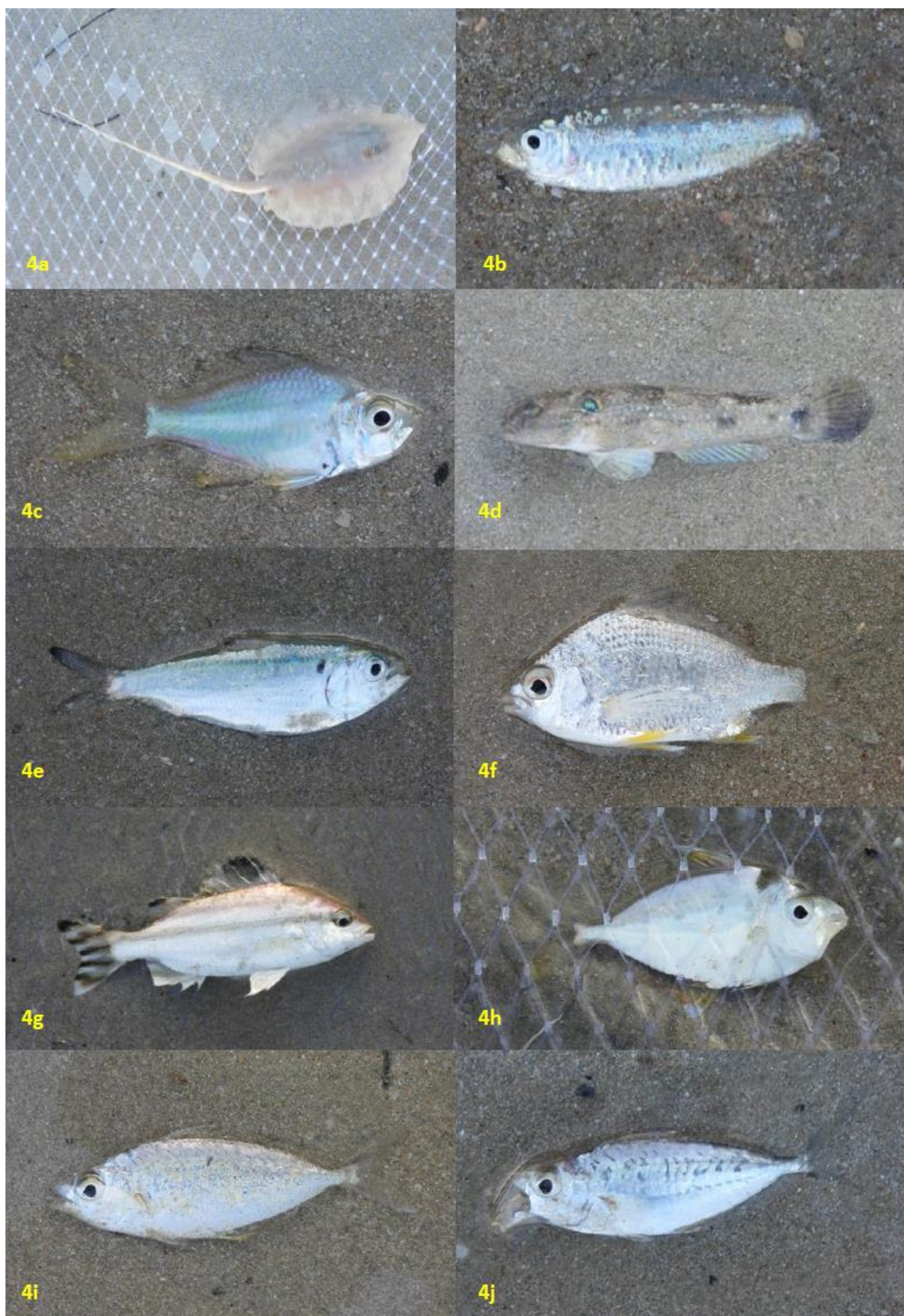


Figure 4. Photographic documentation of fishes from Pukan Beach, Bangka Island. Sumatra: 4a. *Brevitrygon walga*, 4b. *Sardinella lemuru*, 4c. *Ambassis interrupta*, 4d. *Acentrogobius caninus*, 4e. *Anodontostoma chacunda*, 4f. *Gerres erythrouus*, 4g. *Terapon theraps*, 4h. *Leiognathus brevirostris*, 4i. *Equulites leuciscus*, and 4j. *Equulites elongatus* (Photograph: Muhammad Iqbal).



Figure 5. Photographic documentation of fishes from Pukan Beach, Bangka Island. Sumatra: 5a. *Triacanthus nieuhofii*, 5b. *Carangoides praeustus*, 5c. *Callionymus* sp., 5d. *Callionymus* sp. (ventral view), 5e. *Platycephalus indicus*, 5f. *P. Indicus* (ventral view), 5g. *Onigocia spinosa*, 5h. *O. Spinosa* (lateral view), 5i. *Sillago aeolus*, 5j. *Saurida micropectoralis*, 5k. *Lagocephalus scleratus*, and 5l. *L. spadiceus* (Photograph: Muhammad Iqbal).

The fishes were divided into 14 families, including Dasyatidae (1 species), Dorosomatidae (2 species), Gobiidae (1 species), Ambassidae (1 species), Gerreidae (1 species), Terapontidae (1 species), Leiognathidae (3 species), Carangidae (1 species), Callionymidae (1 species), Platycephalidae (2 species), Synodontidae (1 species), Sillaginidae (1 species), Triacanthidae (1 species), and Tetraodontidae (2 species). The most dominant families were Leiognathidae (3 species), followed by Dorosomatidae and Platycephalidae (2 species). The diversity of inshore fishes at Pukan Beach indicates a healthy marine ecosystem. The records of species of fishes from various families suggest a good condition of marine environments, consistent with previous studies (Carey & Wahl 2011; Pinna *et al.* 2023). Some possible factors to consider in explaining the presence of these species include: water quality and chemistry, habitat characteristics (e.g., substrate, vegetation, depth), food availability and trophic relationships, adaptations to local environmental conditions (e.g., temperature, salinity, currents), geographic distribution, ecological niches and interactions with other species.

The fishes were collected during the low tide, and the length ranged from 5-40 cm, with the majority (80%) being small-sized (<20 cm). Fish abundance and diversity fluctuated significantly between morning, afternoon, evening, and night tides. This variation may be attributed to tidal-induced changes in water temperature, salinity and food availability. The presence of commercial species like *Terapon* sp., *Saurida* sp., and *Ambassis* sp. highlights the fishery potential of the area (White *et al.* 2013). However, the small size of most fish caught raises concerns about overfishing and sustainability.

The findings of this study emphasize the need for conservation efforts to protect Pukan Beach's marine biodiversity. Bangka Belitung Islands Province is a maritime province that has high fisheries potential. In 2018, fishermen's catches are quite abundant, and Bangka Belitung fishermen managed to catch 228.5 thousand tons of fish, or the equivalent of IDR 8.3 trillion (Babelprov 2024). There is little information on Ichthyofauna in Bangka Belitung Islands Province, but the research of Ichthyofauna is still limited (Bukhari *et al.* 2017; Akbar *et al.* 2018; Kurniawan & Farhaby 2018; Kurniawan *et al.* 2019; Hafizah *et al.* 2023; Adibrata *et al.* 2024; Baifa *et al.* 2024). As Pukan Beach is an open-access tourist area, the recommendations for monitoring fish populations and habitat health are crucial to maintaining the ecological balance. Further studies should investigate the impact of tourism activities on Pukan Beach's marine ecosystem, and research priorities include assessing fish population dynamics, monitoring water quality, and exploring sustainable fishing practices. Collaborative management efforts between stakeholders, universities, local communities, and government agencies are essential for conserving Pukan Beach's marine biodiversity.

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