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Observation of A White-bellied Sea-Eagle *Icthyophaga leucogaster* (Accipitriformes: Accipitridae) Preying on A Jellyfish (Cnidaria: Medusozoa)

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Abstract
The White-bellied Sea-Eagle *Icthyophaga leucogaster* is a widespread Indo-Pacific raptor known for its predominantly piscivorous diet and opportunistic foraging behavior. Here, we report an unusual feeding observation of a juvenile *I. leucogaster* preying on a jellyfish at the mouth of the Sembilang River, South Sumatra, Indonesia, on 20 February 2018, at approximately 11:00 hrs. The eagle was observed lifting the jellyfish from the water surface and transporting it in its talons while in flight to a nearby perch. Jellyfish are rarely reported as prey for raptors and are generally regarded as having low nutritional value; however, their high visibility and ease of capture during periods of abundance may provide short-term energetic gains. This observation broadens current knowledge of the dietary range of *I. leucogaster* and underscores the species' behavioral flexibility in exploiting unconventional prey resources.

Keywords: *Icthyophaga leucogaster*, foraging, Medusozoa, raptor, Sumatra, White-bellied Sea-Eagle.

Introduction

Indonesia is recognized as one of the world's megadiverse countries, supporting exceptionally high levels of biodiversity across terrestrial, freshwater, and marine ecosystems (IBSAP 2016, 2024). The coastal and estuarine ecosystems of Indonesia, including mangroves, mudflats, and river mouths, provide important habitats for a wide range of organisms, from planktonic invertebrates to large marine predators (Zulkifli *et al.* 2012; Iqbal *et al.* 2026). These productive environments sustain complex food webs that support numerous bird species, particularly coastal raptors, shorebirds and seabirds (Iqbal *et al.* 2022b, 2025).

One of the prominent raptors inhabiting these coastal ecosystems is the White-bellied Sea-Eagle *Icthyophaga leucogaster*, a large eagle widely distributed across South and Southeast Asia, extending to Australia and the western Pacific (Marchant & Higgins 1993; Thiollay *et al.* 1994). The species typically inhabits coastal waters, estuaries, mangrove forests, and large rivers where it hunts over open water (Thiollay *et al.* 1994; Ferguson-Lees & Christie 2001). Its diet is known to consist mainly of

fish, but it is also capable of taking birds, reptiles, small mammals, and carrion. (Ferguson-Lees & Christie 2001; Olsen *et al*. 2006; Clohessy 2014; Fuentes *et al.* 2024). Previous studies have highlighted the opportunistic feeding behavior of this species, allowing it to exploit a variety of prey depending on local availability and environmental conditions (Woodall 1982; Debus 2008, 2012).

Jellyfish, belonging to the phylum Cnidaria, are common components of marine ecosystems and can occur in large numbers during seasonal bloom events (Roca *et al.* 2025). Although jellyfish are generally considered to have low caloric value due to their highwater content, they represent a significant biomass in marine food webs and are consumed by various marine organisms such as fish, sea turtles, and some seabirds (Hays *et al.* 2018). However, reports of raptors feeding on jellyfish are extremely scarce, with virtually no documented records available in the published literature (Thiollay *et al.* 1994; Ferguson-Lees & Christie 2001; Olsen *et al.* 2013). In this paper, we report an observation of *I. leucogaster* feeding on a jellyfish at the mouth of the Sembilang River, Sumatra, Indonesia. This observation provides additional information on the feeding ecology of the species and highlights a rarely documented trophic interaction within tropical coastal ecosystems.

Methods

The observation was made at the mouth of the Sembilang River, Banyuasin Regency, South Sumatra, Indonesia, a coastal estuarine environment situated within Berbak Sembilang National Park. The area is characterized by extensive mangrove forests, tidal mudflats, and estuarine waters influenced by tidal exchange with the Bangka Strait (Iqbal *et al.* 2021, 2022a). These habitats support a high diversity of marine and coastal fauna and serve as important foraging grounds for many waterbirds and raptors, including *I. leucogaster* (Iqbal 2004a, b).

The feeding behavior was recorded opportunistically during a bird survey conducted on 20 February 2018 at approximately 11:00 hrs. Observations were made from the guard post of the Berbak Sembilang National Park office located near the river mouth. The surrounding area was scanned for birds using binoculars (10× magnification) and a camera with high magnification, while behavioral observations were documented through field notes and photographs when possible.

The raptor was identified as a juvenile *I. leucogaster* based on its diagnostic morphological characteristics, including its large body size, mottled brown plumage, absence of the distinctive white head and belly seen in adults, and its characteristic wing shape. Identification followed standard regional field guides (*eg.* MacKinnon & Phillipps 1993; Eaton *et al*. 2021; Taufiqurrahman *et al.* 2022), and the species is well known to most observers in the region. The prey appeared soft and partially collapsed, a characteristic typical of jellyfish when lifted out of water, and displayed a whitish, semi-transparent texture consistent with the bell tissue of many jellyfish species. The observation was documented as an opportunistic feeding record, and details of the event, including the time, location, and prey-handling behavior, were recorded for subsequent analysis and comparison with published information on the diet of the species.

Results and Discussion

At approximately 11:00 hrs on 20 February 2018, a juvenile *I. leucogaster* was observed foraging at the mouth of the Sembilang River, Sumatra, Indonesia, from a guard post within Berbak Sembilang National Park. The eagle was seen flying low over the estuary before descending to seize a floating prey item with its talons. The prey was lifted from the water surface and carried to a nearby perch along the river edge, where it was consumed (Fig. 1). Referring to the field guide to jellyfish of the western Pacific (Maran *et al.* 2021), the specimen was tentatively identified as *Acromitus flagellatus*, a jellyfish species commonly found in brackish environments such as mangroves, estuaries, and coastal waters. Its known distribution and habitat correspond well with the mangrove estuarine conditions at the mouth of the Sembilang River. No other prey items were observed during the event.

The White-bellied Sea-Eagle *I. leucogaster* is widely recognized as a coastal raptor with a diet dominated primarily by fish, although it is also known to consume birds, reptiles, mammals, and carrion depending on prey availability (Thiollay *et al.* 1994; Ferguson-Lees & Christie 2001). Previous studies have documented the species' flexible foraging strategies and opportunistic feeding behavior across a range of habitats, particularly in wetlands and coastal environments. Such dietary flexibility enables the species to exploit locally abundant or easily captured prey (Iqbal *et al.* 2013).



Figure 1. A White-bellied Sea-Eagle *Icthyophaga leucogaster* lifting a jellyfish *cf. Acromitus flagellatus* from the water at the mouth of the Sembilang River, Banyuasin Peninsula, South Sumatra, Indonesia, on 20 February 2018. (Photograph: Muhammad Iqbal).



Figure 1. Close-up of a jellyfish *cf. Acromitus flagellates* lifted from the water by a White-bellied Sea-Eagle *Icthyophaga leucogaster* at the mouth of the Sembilang River, Banyuasin Peninsula, South Sumatra, Indonesia, on 20 February 2018 (Photograph: Muhammad Iqbal).

The present observation of *I. leucogaster* consuming a jellyfish represents a highly unusual prey record for a raptor. Jellyfish are generally considered nutritionally poor prey items because of their extremely high water content and relatively low caloric value (Marques *et al*. 2016). Consequently, they are rarely included in the diet of higher trophic-level predators such as raptors. Nevertheless, jellyfish blooms can produce large concentrations of gelatinous biomass in coastal waters, potentially making them conspicuous and easily captured prey at the water surface (Lamb 2018).

In such situations, opportunistic predators may occasionally exploit jellyfish as an available food resource, particularly when they are stranded near shorelines or concentrated in estuarine environments (Milisenda *et al*. 2014). For a surface-foraging raptor such as *I. leucogaster* (Wells 1999; Naoroji 2006), floating jellyfish may be visually conspicuous and require minimal effort to capture compared with more agile prey such as fish. Although the energetic value of jellyfish is likely lower than that of typical prey items, their ease of capture may provide short-term energetic benefits. The observation of jellyfish predation by *I. leucogaster* expands the known dietary breadth of the species and highlights its behavioral flexibility in exploiting unconventional prey resources. Opportunistic feeding on atypical prey may play a role in the survival of juvenile or inexperienced individuals, which may experiment with a wider variety of prey types during foraging (Iqbal *et al*. 2013). As a further point for consideration, it may be worth noting that dietary studies based on pellets or prey remains are unlikely to detect jellyfish, as they lack hard indigestible structures. The rarity of jellyfish in the diet of the Sea-Eagle is also supported by the absence of jellyfish records in dietary studies based on field observations conducted by citizen scientists (Biggs *et al*. 2025a, b). Additional observations would be valuable to determine whether jellyfish consumption by *I. leucogaster* represents a rare incidental event or a more widespread but underreported aspect of its feeding ecology in tropical coastal ecosystems.

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