

BIODIVERSITY OF SHARKS AND RAYS IN SOUTH-EASTERN INDONESIA

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ABSTRACT

Indonesia has a very diverse shark and ray fauna and is the largest chondrichthyan fisheries in the world. Most of the sharks are caught by longlines and gillnets and rays are caught both as target, e.g. in the tangle net and demersal gillnet fisheries, and as bycatch in other fisheries such as in demersal and drift gillnet, trammel net and long line fisheries. The sharks and rays caught from the Indian Ocean, adjacent to Indonesia, were mostly landed at artisanal fisheries in south-eastern Indonesia, such as Pelabuhan Ratu (West Java), Cilacap (Central Java), Kedonganan (Bali), Tanjung Luar (East Lombok), and Kupang (West Timor), and Merauke (West Papua). Surveys were conducted at these fish landing sites between April 2001 and March 2006, with a total of 80 species of sharks belonging to 21 families recorded. The dominant shark family was the Carcharhinidae with 27 species. A high diversity of sharks was recorded at Kedonganan (49 species), at Tanjung Luar (47 species), at Cilacap (32 species), and at Pelabuhan Ratu (27 species). A total of 55 species of rays belonging to one of 12 families were recorded from the same landing sites. The most speciose and commonly recorded family of rays was the Dasyatidae, which was represented by 28 species, and contributed 65.2% to the total number of chondrichthyan individuals recorded. The most abundant dasyatids recorded were the smaller ray species *Neotrygon kuhlii*, *Dasyatis zugei*, and *Himantura walga*, and the larger species *Himantura gerrardi* and *Himantura fai* which collectively comprised 57.8% of the total number of all chondrichthyans landed.

KEYWORDS: shark, ray, biodiversity, south-eastern Indonesia

INTRODUCTION

Indonesia is known as having the highest diversity of elasmobranchs (sharks and rays) in the world (Blaber, 2006), with their fishery production reported as 100,037 tones in 2005 (Directorate General of Capture Fisheries, 2007) and then increased to be 110,528 tones in 2006 (Directorate General of Capture Fisheries, 2008). Most elasmobranchs are caught opportunistically through-out Indonesian waters, mainly in coastal artisanal fisheries and bycatch of commercial shrimp trawlers (Keong in Camhi et al., 2008). The reported elasmobranch landings in Indonesia consist of 66% sharks and 34% rays, of which, members of the Dasyatidae are, by far, the most dominant species (Carpenter & Niem, 1999; Stevens et al., 2000). In 2006, a study conducted by fisheries scientist, Shelley Clarke, indicated that up to 73 million sharks are now being killed annually to supply the fin trade. This was three times higher than the official catch statistics reported by the FAO, because it included new data taken from illegal shark fin traders who unreported their catches ([www.elasmodiver.com/Shark books](http://www.elasmodiver.com/Shark%20books)).

The diversity of sharks was recorded of about 375-500 species in the world, which was dominated by the order of Carcharhiniformes (ground sharks; 56%).

There are three other major groups, Squaliformes (dogfish sharks), Orectolobiformes (carpet sharks), and Lamniformes (mackerel sharks) that respectively comprise 23, 8, and 4% of the living sharks (Demski & Wourms, 1993; FAO, 2000). More than 400 species of chondrichthyes consist of sharks, rays, and chimaera (600 species) in the world (Camhi et al., 1998; Compagno (1984; 2002). While Fahmi & Dharmadi (2005) estimated that Indonesian waters contain more than 200 chondrichthyan species.

The high diversity of the elasmobranch fauna in Indonesia has been well documented by Gloerfelt-Tarp & Kailola (1984), Last & Stevens (1994), Carpenter & Niem (1999). Elasmobranchs are caught in Indonesia by both as target fisheries and as bycatch in other fisheries. Target fisheries, which are mainly artisanal, use a variety of fishing methods, such as gillnets, trammel nets, purse seines, longlines, and droplines. The fisheries that land substantial catches of elasmobranchs as a bycatch include the prawn and fish fishery exploited by commercial trawlers and pelagic tuna fisheries. Although Indonesia has the largest chondrichthyan fishery and is considered to have one of the richest chondrichthyan fauna in the world, there are almost no published biodiversity of sharks and rays in Indonesia. In a region where shark and ray population are amongst the most heavily