

STOCK ABUNDANCE INDEX, DENSITY, COMPOSITION, AND DISTRIBUTION OF DEEP-SEA SHARK AND RAY RESOURCES IN THE EASTERN INDIAN OCEAN

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ABSTRACT

Deep-sea shark and ray resources in the Indian Ocean provide one of the most economically important fish mesopelagic and demersal resources. Data analyzed were part of the survey carried out in May to June 2005 in the framework of *The Japan-Indonesia Deep Sea Fisheries Resources Joint Exploration Marine Research 2004*. Data were obtained by using bottom trawl operated by using the research vessel R/V Baruna Jaya IV (1.219 GT) in Southern Java and Western Sumatera. The stock density of rays in the southern Java is estimated about 3.94 tonnes km⁻², or about six time higher than in the western Sumatera, while the density of the sharks resources in the waters of southern Java was about 0.36 tonnes km⁻², in the western Sumatera was 0.35 tonnes km⁻². During the period of survey the total catch of sharks in the southern Java was almost 50% higher than in the western Sumatera. The maximum catch rate in the western Sumatera was more than three time higher compared with the maximum catch rate in southern Java, however the difference of the minimum and the mean catch rate in both areas was not statistically significant. Total of 13 species of rays belonging to the 4 families found during the survey period were identified and recorded. The detail 12 species found in the southern Java and only 7 species in the western Sumatera. The most abundance families in both waters are the Plesiobatidae, with species *Plesiobatis* sp., *Plesiobatis daviesi*, and Hexatrygonidae, with only one species, *Hexatrygon longirostra*, while a total of 21 species belonging to 11 families of mesopelagic sharks found in the waters of the Indian Ocean were identified. The most dominant species in weight in the southern Java were *Centrophorus* sp. and *Centrophorus moluccensis* (family *Centrophoridae*), while in the western Sumatera was *Mitsukurina owstoni*.

KEYWORDS: deep-sea rays, sharks, stock abundance index, stock density, species composition, distributon, southern Java, western Sumatera, Eastern Indian Ocean

INTRODUCTION

Sharks and rays provide one of the most economically importance fisheries commodities. Almost all parts of the shark body can be utilized and have a high value. Shark fins provide the most expensive part of shark body beside meats, skin, and bone. The fins are usually exported to the international markets, while the meats are usually consumed directly either in the form of fresh or dry salted. The skin after being processed and tanned provide one of the most expensive leathers and turned into fashion accessories, such as wallets, shoes, belts, and others. Shark bones provide raw material for glue while shark liver oil provide raw materials that can be further processes into cosmetics, medicines and other pharmaceutical purposes. Ray resources were not only to fulfill the demand for meat consumption but also for industrial small scale sectors. In the case of skin of sharks and rays, these material are also processed into leathers and turned into fashion accessories, such as wallets, shoes, belts, and others. Cartilaginous rays bones, also provide raw material for glue then to be utilized in wood industry and household equipments (Saleh *et al.*, 1995). Rapid

development in ray fishery drived the ray fishing technology.

Ray resources of Indonesian waters have been exploited for years by the traditional fishers, especially by using set gill net, danish seine, and bottom trawl. The fishing ground for those kinds of fishing gears are usually in coastal waters until about 100 m depth. The catch was almost recorded in every provincial statistics in Indonesia (Anonymous, 2005). The trend of recorded landing in each province almost increased from year to year. During 1974 to 1979, the up trend of production occurred in North Sumatera and East Java, the two Provinces where the catch of rays are predominated the landing (Burhanudin *et al.*, 1984). In 1993 the total rays production in Indonesia reached 35,686 tonnes (Saleh *et al.*, 1995). In 2005 production in western Sumatera recorded 2,667 tonnes and 2,582 tonnes for south Java waters (Anonymous, 2005). This is probably due to the increasing market demand from year to year. The *liong bun* gill net, targetted on rays and bottom long line, have recently developed and expanded especially in the coastal waters of the Java Sea (Hufiadi *et al.*, 2003), while other gears catching rays are usually as by-catch.

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