

# Species Richness of Sea Cucumbers in Saleh Bay Based on Catch of Fishermen

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## Abstract

Sea cucumbers are one of the marine resources that have been exploited on the coast of Saleh Bay, Sumbawa,. Although they have been exploited for a long time, it is not yet known species of sea cucumbers are caught by fishermen. Information about the species of sea cucumbers is necessary to fisheries management. The purpose of this study was to determine the species of sea cucumbers caught in Saleh Bay. This research uses survey method. Information on the species of sea cucumbers caught by fishermen was obtained by conducting interviews with fishermen and observing the sea cucumbers caught. The harvested sea cucumbers are then identified to determine the species. The results showed that there were 22 species of sea cucumbers, namely White teatfish (*H. fuscogilva*), Black teatfish (*H. whitmaei*), Prickly redfish (*T. ananas*), Stonefish (*A. lecanora*), Deepwater redfish (*A. echinites*), Hairy blackfish (*A. miliaris*), Panning's blackfish (*A. palauensis*), Surf redfish (*A. mauritiana*), Elephant trunkfish (*H. fuscopunctata*), Leopardfish/Tigerfish (*B. argus*), Brown sandfish (*B. vitiensis*), Curryfish (*S. herrmanni*), Greenfish (*S. chloronotus*), Amberfish (*T. anax*), Chalkfish (*B. marmorata*), Snakefish (*H. coluber*), Sandfish (*Holothuria scabra*), Lollyfish (*H. atra*), Golden sandfish (*H. lessoni*), Selenka's dragonfish (*S. horrens*), Flowerfish (*Pearsonothuria graeffei*) and Pinkfish (*H. edulis*).

**Keywords:** Saleh bay, Sea cucumbers, Species richness

## 1. Introduction

Sea cucumbers are harvested and traded in more than 70 countries worldwide. The use of sea cucumbers as a food item and a commodity began in China about 1,000 years ago, which encouraged the development of capture fisheries in the region. However, the rising demand of the markets in Asia led to the depletion of local sea cucumber populations and prompted Asian traders to solicit sea cucumbers from locations further afield (Conand, 2004; S. Purcell et al., 2010; Toral-Granda, 2008)

Commercially-exploited sea cucumbers, all from the Orders Aspidochirotida and Dendrochirotida, provide a source of income to millions of coastal fishers worldwide (Purcell et al., 2013) and a source of nutrition to perhaps more than 1 billion Asian consumers. In Asia, sea cucumbers that are commonly fished are derived mainly from the Order Aspidochirotida under two families, Holothuriidae and Stichopodidae. Sea cucumbers belong to the class Holothuroidea and so are also referred to as holothurians. The majority of species harvested commercially belong to the order Aspidochirotida, specifically to the families Holothuriidae and Stichopodidae, and are mostly tropical. A few species belonging to the order Dendrochirotida, family Cucumariidae, are also fished commercially. Currently, sea cucumber fishing occurs all over the world with some populations reportedly over-harvested (Lovatelli et al., 2004; Toral-Granda, 2008; Tuwo, 2004).

Statistics on trepang exported are not separated into individual species, and therefore details on production status and landing trends on individual species are not available. This has been identified as a bottleneck when attempting to implement conservation tools in the international trade (e.g. a CITES listing) and has led to the development of illegal, unreported and unregulated (IUU) trade.

Indonesia is one of the largest exporter sea cucumber in the world. Commercial species are usually given local names by the fishers, and sometimes, different trepang species are given the same local name, adding to the taxonomic confusion (Purwati et al., 2010). Sumbawa is one of region in Indonesia that have sea cucumbers

resources, but this information is still lacking. Information on this resource especially in coast of Saleh Bay is still lacking. This research was conducted to fill the gap by investigating species of sea cucumber in Saleh bay, Sumbawa, West Nusa Tenggara, Indonesia..

### 3. Methods

The study area covered Saleh Bay, where the only known fishery for sea cucumbers in Sumbawa (Fig. 1). The study was conducted at Januari-March 2020 in coast Saleh Bay.

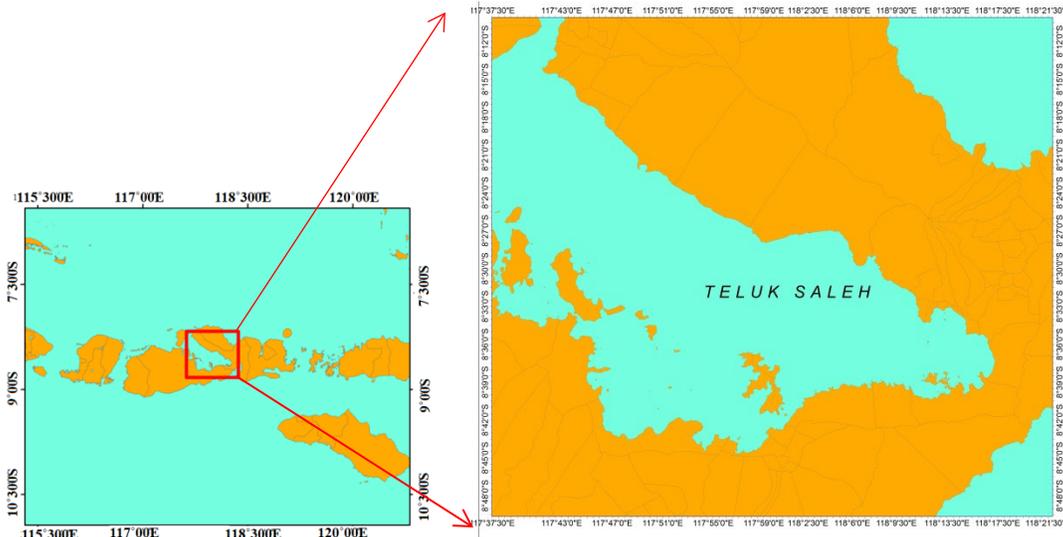


Figure 1. Map Showing Sampling Site

To determine the scientific name, fishermen are shown pictures or photos of each species. we also observed the morphology of sea cucumbers caught by fishermen. Information from fishermen and morphological data is then used as a reference in determining the species of sea cucumber.

### 4. Results and Discussion

Twenty two species of sea cucumbers, eight species from genus *Holothuria*, five species of genus *Actinopyga*, tree species of genus *Stichopus*, tree species of genus *Bohadschia*, two species of genus *Theloneta* and one species from genus *Pearsonothuria* were found in this study (Table 1).

Table 1 Primary species from harvested of fishermen in coast Saleh bay

No	Species	Common name	Lokal name
1	<i>Holothuria fuscogilva</i>	White teatfish	Koro putih/teripang susu
2	<i>Holothuria whitmaei</i>	Black teatfish	Koro pisak
3	<i>Theloneta ananas</i>	Prickly redfish	Teripang nanas
4	<i>Actinopyga lecanora</i>	Stonefish	Batu
5	<i>Actinopyga echinites</i>	Deepwater redfish	Ladang-ladang
6	<i>Actinopyga miliaris</i>	Hairy blackfish	Gamat hitam
7	<i>Actinopyga palauensis</i>	Panning's blackfish	teripang
8	<i>Actinopyga mauritiana</i>	Surf redfish	Buntal
9	<i>Holothuria fuscopunctata</i>	Elephant trunkfish	
10	<i>Bohadschia argus</i>	Leopardfish / Tigerfish	krido bintik/getah
11	<i>Bohadschia vitiensis</i>	Brown sandfish	Krido polos/bembe
12	<i>Stichopus herrmanni</i>	Curryfish	Haeder
13	<i>Stichopus chloronotus</i>	Greenfish	haeder
14	<i>Theloneta anax</i>	Amberfish	Teripang duyung
15	<i>Bohadschia marmorata</i>	Chalkfish	Getah putih

16	<i>Holothuria coluber</i>	Snakefish	Talengko
17	<i>Holothuria scabra</i>	Sandfish	Buang kulit/gosok/loto
18	<i>Holothuria atra</i>	Lollyfish	Teripang pisak
19	<i>Holothuria lesson</i>	Golden sandfish	Kawwas
20	<i>Stichopus horrens</i>	Selenka's dragonfish	Gamat batu
21	<i>Pearsonothuria graeffei</i>	Flowerfish	Kacang-kacang
22	<i>Holothuria edulis</i>	Pinkfish	Cera

The sea cucumber species found in this study were almost the same as those found in other Asian countries. In Asia, sea cucumbers that are commonly fished are derived mainly from the Order Aspidochirotida under two families, Holothuriidae and Stichopodidae. Genuses that are frequently exploited for food include *Holothuria*, *Actinopyga* and *Bohadschia*. The sea cucumber fishery in Indonesia is generally artisanal, and is scattered throughout the many Indonesian islands including Lampung, Java, Nusa Tenggara, Sulawesi, Maluku and Irian Jaya (Tuwo & Conad, 1992).

Species found in the present study is similar to the species recorded by some authors (Natan et al., 2015; Yusron, 2004). According to Bussarawit and Thongtham (1999), *H. scabra*, *H. leucospilota*, *H. edulis*, *B. marmorata*, *T. ananas*, *S. chloronotus* and *S. herrmanni* were collected commercially by fishermen in Rayong and Chon Buri in eastern Thailand. Species heavily exploited in Indonesia include: *A. echinites*, *A. mauritiana*, *A. miliaris*, *B. argus*, *B. vitiensis*, *H. atra*, *H. edulis*, *H. fuscogilva*, *H. fuscopunctata*, *H. whitmaei*, *H. scabra*, *H. scabra* var. *versicolor*, *H. coluber*, *S. chloronotus*, *S. herrmanni*, *T. ananas* and *T. anax* (Tuwo, 2004). (Purwati et al., 2010) successfully identified 18 species of trepang fished in Karimunjawa. (Setyastuti & Purwati, 2015), showed 21 species trepang from Situbondo, Jawa and Sulawesi.

*H. scabra* is one of many species of sea cucumbers harvested by fishermen in Saleh Bay. *Holothuria scabra* (common name: sandfish) is largely distributed and probably supports most of the tropical captures of sea cucumbers for beche-de-mer. *Holothuria scabra*, commonly known as sandfish, is widely distributed throughout the Indo-Pacific, being found roughly between latitudes 30 °N and 30 °S (Hamel et al., 2001). *Holothuria scabra* var. *versicolor* (common name: golden sandfish) differs from *H. scabra* by a number of characters, including a larger mean size and a deeper habitat in New Caledonia (Conand, 2004, 1998, 1989). *B. vitiensis* lives in rather dense populations in shallow back reef areas, where the individuals burrow into the anaerobic sand during the night and emerge at the surface of the oxygenated sand in the morning around 10 A.M.

Coastal processes are also important factors in regulating the distribution of sea cucumber species, as hydrodynamics influence sediment granulometry, which is a key habitat characteristic for defining the niches of holothurians, and larval dispersion (Massin and Doumen, 1986).

## 5. Conclusion

The results showed that there were 22 species of sea cucumbers, namely White teatfish (*H. fuscogilva*), Black teatfish (*H. whitmaei*), Prickly redfish (*T. ananas*), Stonefish (*A. lecanora*), Deepwater redfish (*A. echinites*), Hairy blackfish (*A. miliaris*), Panning's blackfish (*A. palauensis*), Surf redfish (*A. mauritiana*), Elephant trunkfish (*H. fuscopunctata*), Leopardfish/Tigerfish (*B. argus*), Brown sandfish (*B. vitiensis*), Curryfish (*S. herrmanni*), Greenfish (*S. chloronotus*), Amberfish (*T. anax*), Chalkfish (*B. marmorata*), Snakefish (*H. coluber*), Sandfish (*Holothuria scabra*), Lollyfish (*H. atra*), Golden sandfish (*H. lessoni*), Selenka's dragonfish (*S. horrens*), Flowerfish (*Pearsonothuria graeffei*) and Pinkfish (*H. edulis*).

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