

THE SEA CUCUMBERS

OF PALAWAN, PHILIPPINES

A FIELD GUIDE



JEAN BETH S. JONTILA
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*Originally, I want to dedicate this book to my parents,
the fishers, the science community,
and my fellow taxpayers.*

*But lately I was compelled to dedicate this to Jansen,
just for him alone...*

*as a settlement for everything he claims I owe him
but I have no knowledge of, and
for future similar cases. 😊*

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Holothuria coluber

ACKNOWLEDGMENT

My interest on sea cucumbers started in 2007 when Dr. Sabine Schoppe assigned me to work on it for our seminar class. She even handed me her precious collection of manuscripts on sea cucumbers when I was working on my Dissertation. I am beyond grateful Ma'am Sabine.

I am very much thankful as well to my other mentors - Dr. Lota A. Creencia, Dr. Roger G. Dolorosa, and Dr. Harol M. Monteclaro - for their admirable teachings and work ethics that I truly admire. To Dr. Herminie P. Palla, Dr. Allaine T. Baaco, Dr. Julie Hope Timotea P. Evina, and our OIC President Atty./Dr. Joselito C. Alisuag, for their unfailing support to our research endeavors.

To Dr. Marie Antonette Juinio-Meñez, for her untiring support and dedication, and for sharing the opportunities that expanded our work on sea cucumbers. To Dr. Maria Byrne for her valuable input. Thank you so much Ma'am Annete and Dr. Byrne.

My heartfelt thanks also goes to the Department of Science and Technology-Science Education Institute (DOST-SEI) Accelerated Science and Technology Human Resource Development (ASTHRDP), the University of the Philippines in the Visayas (UPV), the management of Dos Palmas Island Resort and Spa, to Ms. Glesselle Batin, Mr. John Sornito, Mr. Lucio Ardines, Mr. Mark Anthony Bernardo, the fisherfolks in various municipalities; to Mr. Jovan A. Gimarangan for polishing the photos; to Mr. Niño Jess Mar F. Mecha for the map; to those who have helped me in many ways during field works— Joylibeth, Joyce Mae, Eunice, Emalyn, and Mary Jane; and to my family, for being there always.

Lastly, I am very much grateful to NAGAO Natural Environment Foundation (NEF) for the financial assistance in publication and dissemination of this field guide. I owe this to all of you. May the Almighty bless you even more.

Jean Beth S. Jontila



Republic of the Philippines
University of the Philippines
Marine Science Institute
Diliman, Quezon City, Philippines

FOREWORD



The very high diversity of sea cucumbers in Palawan is a valuable national asset. Sea cucumbers are important in maintaining the productivity of marine ecosystems through nutrient cycling and oxygenation of sediment. The sea cucumber fishery is a major source of livelihood of coastal communities. Its dried body wall (*trepang*) is a high value seafood commodity and traders consider the *trepang* from Palawan among the best in the Philippines. Aside from its value as a fishery product, the discovery and use of bioactive compounds from different sea cucumber species (e.g. nutraceutical and pharmaceutical products) are of global interest.

This field guide is an essential reference for marine conservation and resource managers, researchers, students and the general public. Identification of the different species is a gateway to a better understanding of the importance of these species and the value of the ecosystems where they are found. Information on the relative economic value, conservation status and distribution in Palawan are also included.

Some of the species documented in this field guide have not been reported from other parts of the country, and others are potentially new species. It is likely that there are other species yet to be discovered from the nearshore and offshore areas around Palawan. This further highlights the rich marine biodiversity resource of Palawan and the need for concerted species conservation and fishery management efforts.

The perseverance of Dr. Jean Beth S. Jontila to make this body of knowledge on the sea cucumbers of Palawan accessible is truly commendable.

Marie Antonette Juinio-Meñez, PhD

Professor

University of the Philippines Marine Science Institute
Academician, National Academy of Science and Technology PH



Republic of the Philippines
Western Philippines University
College of Fisheries and Aquatic Sciences
Puerto Princesa City, Philippines

PREFACE



As early as 1990's, there have been efforts to manage the sea cucumber fishery in the country. However, program implementation and enforcement are constantly challenging our resource managers as harvesting of sea cucumbers remained open and unregulated. Most of our Local Government Units (LGUs) were not aware of the economic and ecological value of sea cucumbers. Enforcement of pertinent regulations is likewise not apparent at the local level.

Acknowledging the need to conserve and manage the sea cucumber fishery in the province, our group conducted an assessment and species inventory in 2012 as part of the nation-wide project led by Dr. Marie Antonette Juinio-Meñez. I continued working on sea cucumbers and documented every species that I encountered. Some of which were first to be reported in the country while others are yet to be identified as they were not seen in available references. Our province is indeed endowed with rich resources that are not yet known to many.

This field guide is envisioned to provide our policy makers, researchers, and resource users a handy reference for sea cucumbers of commercial value including those that are not exploited. It presents the photos I have gathered over the years including those of my colleagues. This field guide also provides the local names of species, their distribution, economic value, and conservation status. I believe that raising the awareness of our locals could lead to greater compliance with existing regulations.

I hope this humble work advances our efforts towards appreciating, conservation, and sustainable utilization of sea cucumbers in Palawan, Philippines.

Jean Beth S. Jontila, PhD

Author

Western Philippines University
Puerto Princesa City, Philippines



Republic of the Philippines
Department of Environment and Natural Resources
Provincial Environment and Natural Resources Office
Puerto Princesa City, Philippines



MESSAGE

The province of Palawan is one of the most attractive regions of the country, and is dubbed as the Philippines' "*last ecological frontier*."

The Department of Environment and Natural Resources - Provincial Environment and Natural Resources Office (DENR-PENRO) recognizes the significant role of the academe in conducting research as basis in the formulation of environmental policy, rules, and regulations to include the implementation of biodiversity-friendly livelihood enterprise development, which contributes in achieving the Department's objectives of increasing productivity and enhancing the contribution of natural resources to achieve national economic and social development and conserving specific marine areas.

This guidebook is another remarkable contribution to the Fisheries Management of Palawan. We are pleased that the Western Philippines University is extending so much effort to the sea cucumber fishery, conservation, and management. The information it provides aids in understanding the classification, key features population status, and socio-economic importance of sea cucumbers that are useful for policymakers and concerned agencies to constitute plans and management strategies. Let us enjoin all users of this book to collectively work towards sustainable management of this resource throughout the province.

FELIZARDO B. CAYATOC

PENR Officer
DENR-PENRO Palawan, Philippines



Republic of the Philippines
Department of Agriculture
BUREAU OF FISHERIES AND AQUATIC RESOURCES
REGIONAL OFFICE - MIMAROPA
Brgy. Guinobatan, Calapan City, Oriental Mindoro, Philippines



MESSAGE

As we move towards an era of sustainably managed fisheries that aims to provide economic stability and a climate resilient community, it is in a great necessity to support studies that showcase the ecological significance of different marine life in our country.

One of the prominent problems in promoting sustainable fishery lies in the amount of conducted study on the status, biology and ecology of fishery species. This is vital in order to formulate suitable and sound policies or regulations to avoid overexploitation and wild stock depletion. As the only identified sea cucumber hotspot in Asia and Palawan being one of its major producers, the Bureau of Fisheries and Aquatic Resources - MIMAROPA backs up on the quest of its conservation and protection through a holistic scientific approach and transparent governance.

I believe that this remarkable book features notable information on the diversity of sea cucumber in the Province of Palawan. It sheds light on the current status of their fishery and the challenges that need to be addressed to ensure their conservation and sustainable use.

I wish to express my gratitude to the author of this book for her exceptional efforts and contributions to science, crucial for our country's fisheries sustainability.

EMMANUEL H. ASIS, DFT, CESE

Director II
BFAR-MIMAROPA, Philippines



Republic of the Philippines
Western Philippines University
Aborlan, Palawan, Philippines



MESSAGE

I would like to congratulate first the author for coming up with this field guide, which is the first to showcase the sea cucumbers of Palawan, Philippines.

In line with the Western Philippines University's vision as a leading knowledge center for sustainable development in West Philippines and beyond, this scholarly work is a timely contribution to the pool of information needed to craft appropriate management measures for one of the most valuable, yet barely manage resources of the country-the sea cucumbers. The dried sea cucumbers called *tre pang* or *bêche-de-mer* belongs to the top 10 marine product export commodities of the country in terms of value and around 20% of its production comes from Palawan. Sea cucumber fishery also supports the livelihood of many marginal fishers, who rely on the bounty of the ocean for living. However, there remains a big challenge in terms of managing this resource as gathering remains open and unregulated. Even the threatened ones are collected and traded. With this field guide, we hope that management initiatives could advance towards conservation and sustainable utilization of sea cucumbers in Palawan and beyond.

Again, my congratulations to Dr. Jean Beth S. Jontila for her commendable work!

ATTY. JOSELITO C. ALISUAG, PhD, CSEE
OIC President
Western Philippines University



Republic of the Philippines
Palawan Council for Sustainable Development
Puerto Princesa City, Philippines



MESSAGE

In behalf of the Palawan Council for Sustainable Development Staff (PCSDS), it is an opportunity to congratulate the author and the College of Fisheries and Aquatic Sciences of the Western Philippines University-Puerto Princesa Campus for the publication of the former's work, "The Sea Cucumbers of Palawan, Philippines: A Field Guide"

In the light of our mandates under Republic Act 7611 otherwise known as the Strategic Environmental Plan (SEP) for Palawan Act and the provisions of Republic Act No. 9147 designating the Palawan Council for Sustainable Development (PCSD) as the implementing agency of the Wildlife Resources Conservation and Protection Act in the Province of Palawan, we are pleased to note that this book is in line with our research thrust on Economically Important Species (EIS) and Threatened Species Population studies. It provides information and additional species-specific data that we need at PCSDS to address the issues on commonly-harvested species in the province. This book is a worthy contribution to the efforts on wildlife conservation and management particularly on the long-term conservation and sustainability of sea cucumber fishery in Palawan, Philippines.

Again, congratulations for this commendable initiative.

NIÑO REY C. ESTOYA, MNSA, CESE
Acting Executive Director
Palawan Council for Sustainable Development Staff
Puerto Princesa City, Philippines



MESSAGE

Congratulations to this very much needed and awaited field guide on sea cucumbers.

Sea cucumbers play a crucial ecological role. They feed on minute particles from either the ground or the water column. This reduces the organic load and converts it into nutrients, hence contributing to the productivity of the marine ecosystem. Some species of sea cucumbers also help buffering sea waters thus easing calcification of corals. At the same time, many species of sea cucumbers are among the most commercially exploited aquatic species in Southeast Asia, providing income to millions of people. In the Philippines, commercial exploitation of sea cucumbers that are processed into a dried form internationally known as *trepang* or *bêche-de-mer* dates to the late 18th century. Yet the increasing demand for over 40 years has led to overfishing of wild stocks calling for conservation measures such as size limits, aquaculture, and marine sanctuaries.

This field guide provides the needed information to identify the different kinds of sea cucumbers commonly seen in Palawan. This knowledge is needed for management and conservation.

I stand with Jane Goodall who said “Only if we understand, can we care. Only if we care, we will help. Only if we help, we shall be saved”.

Sabine Schoppe, PhD

Director

Palawan Pangolin Conservation Program

Palawan Freshwater Turtle Conservation Program

Palawan, Philippines



THE UNIVERSITY OF
SYDNEY



MESSAGE

This beautiful book on the sea cucumbers of Palawan is a very important resource for educators, researchers, and managers. It will be of great assistance in identification of species in the field and has very useful information on the local distribution of the species and their key features.

This work is especially important for the fisheries and conservation of the commercial species processed into trepang or *bêche-de-mer*. Many of the commercial species are of conservation concern and the book provides information on their IUCN and CITES status. This is crucial to create awareness in the community to protect these valuable resources.

I commend the author for producing this very timely field guide.

Maria Byrne, PhD
Professor of Marine Biology
The University of Sydney
Sydney, Australia



Stichopus horrens

INTRODUCTION

Sea cucumbers are marine invertebrates that belong to Phylum Echinodermata, Class Holothuroidea (Conand 1998). They come in various form but generally they have elongated body, pentamerous symmetry with water vascular system. The mouth at the anterior is surrounded by tentacles that aid in feeding while the anus at the opposite end of the body is left exposed when burried in sand. Generally, sea cucumbers are benthic with few being pelagic (Miller and Pawson 1990). They mostly abound in seagrass beds and coral reefs while some dwell in mangroves and rocky shores.

Regarded as the earthworms of the sea, sea cucumbers play vital roles in nutrient recycling and benthic productivity (Purcell et al. 2016; Mercier et al. 1999; Wolkenhauer et al. 2010) including pH regulation. However, they are known more for their economic value such as food (Akamine 2005; Purcell et al. 2018) and pharmaceutical products (Bordbar et al. 2011). Their body wall is processed into what popularly known as *trebang* or *bêche-de-mer*, and *hai som* or *hai sam* (Akamine 2005). It is for their dried body wall that most of the tropic species in the wild are harvested.

Across the globe, there are about 70 commercially important sea cucumbers (Purcell et al. 2012) and at least 36 species are regularly harvested in Palawan, Philippines (Dolorosa et al. 2017; Jontila et al. 2018a; Ardines et al. 2020). The traded species belong to order Holothuriida, Synallactida, Dendrochirotida and Molpadida (Purcell et al. 2023; Simone et al. 2023). Among the high-valued species that are usually collected are *Holothuria scabra*, *H. fuscogilva*, and *Stichopus* species. Apparently, these are also the species listed in Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix II and International Union for Conservation of Nature (IUCN) Red List of Threatened Species.

This field guide presents 50 species of sea cucumbers in Palawan, which belongs to Family Caudinidae, Holothuriidae, Stichopodidae, and Synaptidae under Order Molpadida, Holothuriida, Synallactida (Purcel et al. 2023) and Apodida. It also includes those species that are not exploited. Some species like *Bohadschia koellikeri*, *Euapta godoffroyi* and *Synaptula* sp. were documented only by Dr. Roger G. Dolorosa, who was generous enough to share his amazing photos. Additionally, a number of species here such as *Holothuria cavans*, *H. flavomaculata*, *Stichopus rubermacolosus* and *S. quadrifasciatus* were not yet reported in other parts of the country. This field guide further highlights the distinguishing features of each species including their local names, IUCN status (IUCN 2023) and CITES listing (Simone et al. 2023), as well as information on their habitat, economic value, and areas around Palawan where they were documented. The maximum sizes were based on Purcel et al. 2023 while the common sizes were observed and recorded by the author in Palawan, unless otherwise indicated. It has to be noted that the distribution of the species presented here are limited only to the findings of the author and the published studies in the province (Dolorosa & Jontila 2012; Jontila et al. 2014; Dolorosa 2015; Ardines et al. 2018; Caabay 2018; Jontila et al. 2017; Balisco et al. 2020. Given that many areas were not explored yet, the distribution could be much wider than presented here.

Overall, this field guide aims to provide a handy reference for researchers, resource users, traders, and policy makers. May this serve as catalyst for concerned agencies to manage the sea cucumber fishery for sustained economic and ecological benefits.

Jean Beth S. Jontila

Author

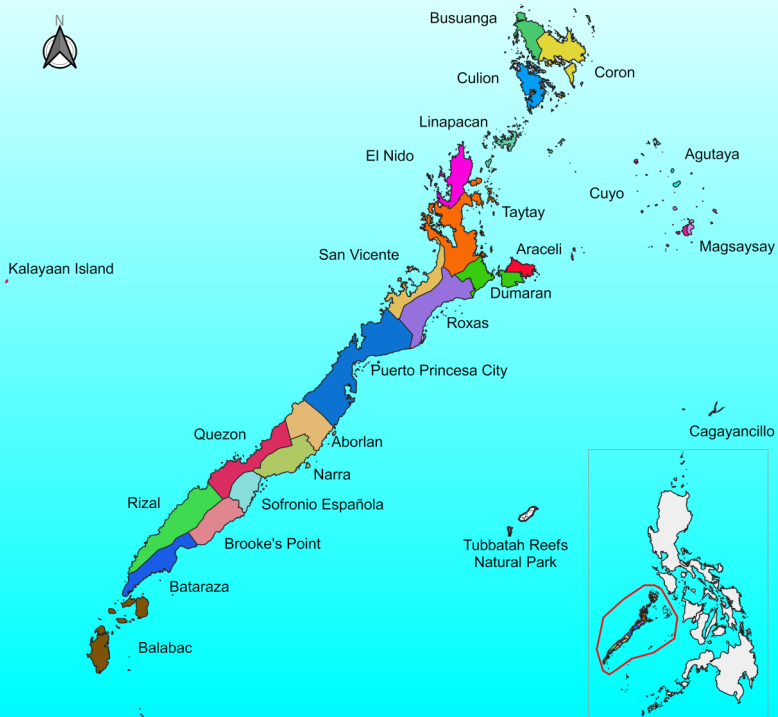
SEA CUCUMBER FISHERY, CONSERVATION, AND MANAGEMENT

Sea cucumbers are among the regularly harvested marine resources in Palawan, Philippines. Its fishery supports the livelihood of many small-scale and marginal fishers. Sea cucumbers are mainly gathered for export of *trepang* or its dried form, which ranked 10th as marine product export commodity of the country in terms of value. Over the years, *trepang's* price has steadily increase both in local and international markets. Currently, the price range from PhP 800.00-7,000.00 kg⁻¹ depending on species, size, and quality. In 2016, *Holothuria scabra* and *H. fuscogilva* are sold in international market as much as USD 251 kg⁻¹ and 219 kg⁻¹, respectively (Purcell et al. 2018). Such fueled massive harvesting of sea cucumbers, which led to population decline and local depletion of commercially important species in nearshore areas (Dolorosa et al. 2017) and exploitation of new sites (Jontila et al. 2018a). The number of exploited species also increased from 25 in late 1990's (Schoppe 2000) to 37 species in 2018 (Jontila et al. 2018b). In fact, the country was reported as sea cucumber hotspot in Souteast Asia (Choo 2008).

Acknowledging the need to regulate the harvesting, the Bureau of Fisheries and Aquatic Resources issued an Administrative Circular 248 in 2013 (DA-BFAR 2013), which imposed sized limit and permit system and likewise listed the threatened species. Similarly, the Palawan Council for Sustainable Development Staff (PCSDS) banned the gathering of threatened species as per PCSD Resolution No. 15-521. However, enforcement of these regulations has to be strenghtened. Additionally, there are initiatives on hatchery production of valuable species like *H. scabra* and *H. fuscogilva* for culture, sea ranching, and stock enhancement.

PALAWAN, PHILIPPINES

Man and Biosphere Reserve



Palawan is an island located in the Southwest of the country with 23 municipalities. In recognition of its outstanding biodiversity, pristine ecosystems, and rich culture, the United Nations Educational, Scientific and Cultural Organization (UNESCO) declared the province as a Man and Biosphere Reserve in 1991. The province also harbors two World Heritage Sites– The Puerto Princesa Subterranean River National Park (PPSRNP) and the Tubbataha Reefs Natural Park (TRNP). Likewise, it is a major producer of wild-caught fish and also supplies around 20% of country's *trepang* production (Brown et al. 2010).

GLOSSARY

Anal teeth: radial extremely calcified papillae encircling the anus, appearing tooth-like.

Bêche-de-mer: widely used term for the processed product of sea cucumbers (see also trepang).

Blotch: patch of uneven and prominent coloration in the body.

Cuvierian tubules: threads becoming sticky when ejected out of the anus and used as a defence mechanism.

Dorsal: upper surface of the animal.

Low economic value: dried product costs below PhP1,000.00 kg⁻¹

Medium economic value: dried product costs between PhP1,001.00 and PhP 3,000.00 kg⁻¹.

High economic value: dried product costs more than PhP3,001.00 kg⁻¹.

Papillae: conical lumps or small fleshy extensions on the surface of the body wall.

Podia: or feet, which are tiny tubes filled with water having calcareous end used for locomotion.

Teats: large papillae at the border of the ventral surface of the animal.

Tegument: the outer tissues of the animal, including the cuticle and epidermis.

Tentacles: buccal podia extended from the mouth for feeding.

Transverse: across the body, perpendicular to the main axis of the body.

Trepang: Malaysian name for sea cucumber, also refers to dried body of sea cucumbers.

Ventral: on the bottom, or under surface of the animal.

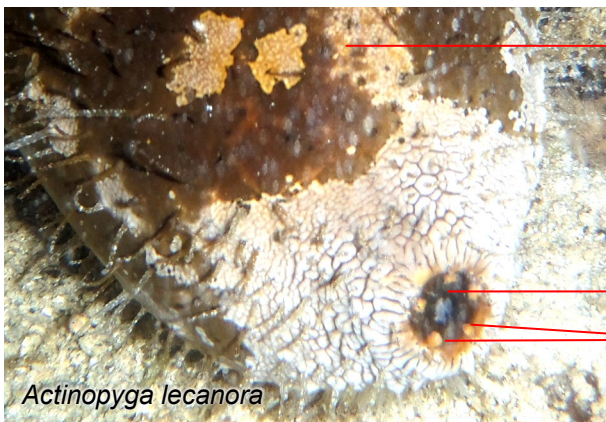
EXTERNAL PARTS OF SEA CUCUMBER



Tentacles

Mouth

Holothuria leucospilota



Blotch

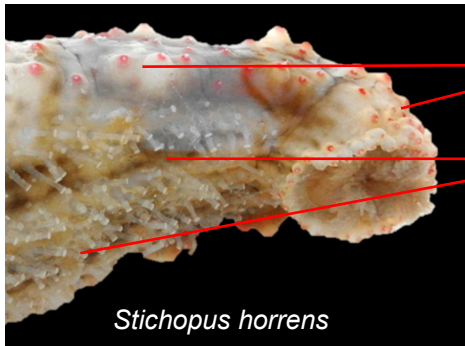
Anus

Anal teeth

Actinopyga lecanora

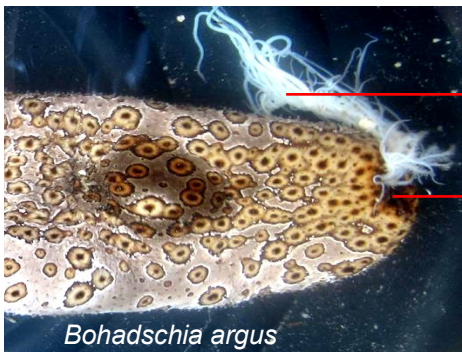


Papillae



Papillae

Tube feet/
podia



Cuvierian tubules

Anus

Order Molpadida

Family Caudinidae

- The tegument is soft, with discoloration and the ventral side is almost transparent.
- Species under this family are commonly found in muddy to sandy areas.
- Harvested but not processed into trepang and eaten instead raw or pickled by the locals.



Family Caudinidae



Acaudina sp.

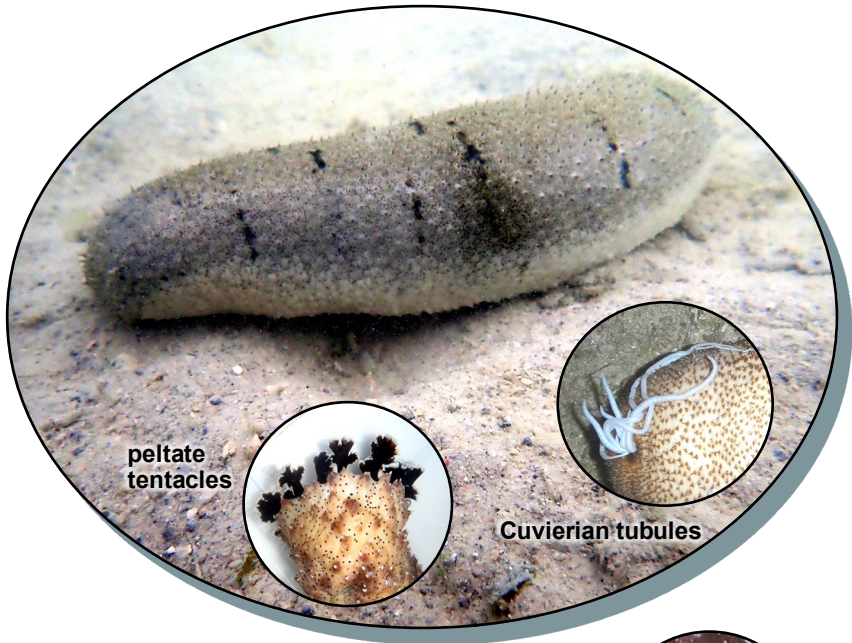
Common Name:	Smooth sea cucumber
Local Name:	Unknown
IUCN Status:	Not Listed
Economic Value:	Low

Key Features:

- The body is cylindrical and orange-brownish in color.
- The tegument is thin and smooth all over.
- It is found in the muddy substrates of mangroves.
- Consumed fresh or pickled
- Sold fresh in local markets at PHP 20.00/pack.
- Maximum size: 25 cm
- Common size: 15 cm



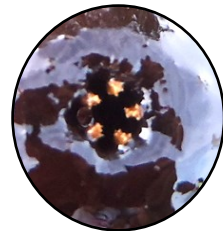
Order Holothuriida Family Holothuriidae



**peltate
tentacles**

Cuvierian tubules

- The shape is usually slender and elongated.
- The body wall is thick and muscular.
- With 10-30 peltate tentacles.
- Some have Cuvierian tubules.
- Widely distributed in shallow seagrass beds, reef flats and coral reefs.



Anal teeth

Family Holothuriidae

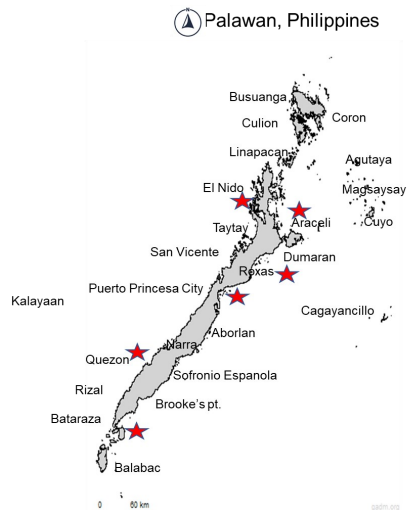


Actinopyga echinites (Jaeger, 1833)

Common Name:	Deep-water redfish
Local Name:	Khaki
IUCN status:	Vulnerable
Economic Value:	Medium

Key Features:

- The color varies from beige to light or dark brown, darker on dorsal surface.
- The body is moderately elongated with fine papillae extended when at a natural state.
- When disturbed, the body arched, papillae retract, and become wrinkled.
- It is found in shallow seagrass beds.
- Maximum size: 35 cm
- Common size: 15 cm



Family Holothuriidae



Actinopyga lecanora (Jaeger, 1835)

Common Name:	Stone fish
Local Name:	Munang, Monang, Buli, Buli-buli
IUCN Status:	Data Deficient
Economic Value:	Medium

Key Features:

- The color ranges from beige to brown or orange-brown with lighter spots scattered on the dorsal.
- The long slender papillae are scattered at dorsal and only visible when the specimen is relaxed.
- With white coloration around its anus that has five prominent anal teeth.
- Found in shallow seagrass beds and coral reefs.
- Maximum size: 24 cm
- Common size: 15 cm

Palawan, Philippines





Photo: RG Dolorosa



Variants of *Actinopyga lecanora*

Photo: RG Dolorosa

Family Holothuriidae



Actinopyga mauritiana (Quoy and Gaimard, 1833)

Common Name:	Surf redfish
Local Name:	Unknown
IUCN Status:	Vulnerable
Economic Value:	High

Key Features:

- The color of the dorsum is dark brown, sprinkled with white spots.
- The ventral is light brown in color.
- The long slender papillae protrude when in a relax state.
- It is found in seagrass beds with coral-rubble substrates.
- Maximum size: 35 cm
- Common size: 17 cm



Family Holothuriidae



Actinopyga palauensis (Panning, 1944)

Common Name:	Deep water blackfish, Panning's blackfish
Local Name:	Bakungan
IUCN Status:	Least Concern
Economic Value:	High

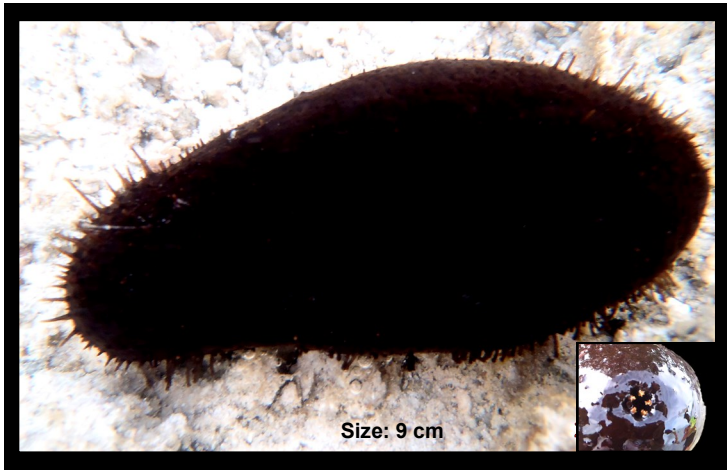
Key Features:

- The body is brownish-black in color, subcylindrical in shape, and slightly flattened ventrally.
- The upper part of the dorsal is usually covered by sand (Purcell et al. 2012).
- Common in coral reefs.
- Maximum size: 40 cm
- Common size: 27 cm

▲ Palawan, Philippines



Family Holothuriidae



Actinopyga spinea (Cherbonnier, 1980)

Common Name:	Burying black fish
Local Name:	Unknown
IUCN Status:	Least Concern
Economic Value:	Medium

Key Features:

- The color is dark brown and the surface is slimy.
- The papillae are long and slender that protrude when in a relax state.
- The specimen here measured only 9 cm and is suspected to be a sub-adult.
- It is found in seagrass beds with coral-rubble substrates.
- Maximum size: 38 cm
- Common size: 20 cm



Family Holothuriidae



Actinopyga sp.

Common Name:	Unknown
Local Name:	Munang
IUCN Status:	Not Listed
Economic Value:	Medium

Key Features:

- The dorsal is black with dark brown patches. Anal teeth are present thus identified as *Actinopyga* sp.
- It is found in shallow coral reefs.
- Maximum size: unknown
- Common size: 15 cm

Palawan, Philippines



Family Holothuriidae



Bohadschia argus (Massin, Rasolofonirina, Conand and Samyn, 1999)

Common Name: Leopard fish
Local Name: Matang-itik
IUCN Status: Least Concern
Economic Value: Medium

Key Features:

- The color is generally grey with tint of light brown or beige.
- The dorsal portion has large, almost round yellowish spots surrounded with black dots at the center.
- The body is cylindrical, moderately long (up to 60 cm).
- It ejects Cuvierian tubules when disturbed or stressed.
- Taken from shallow coral reef at 3-5 m deep.
- Maximum size: 60 cm
- Common size: 30 cm



Family Holothuriidae



Bohadschia marmorata (Jaeger, 1833)

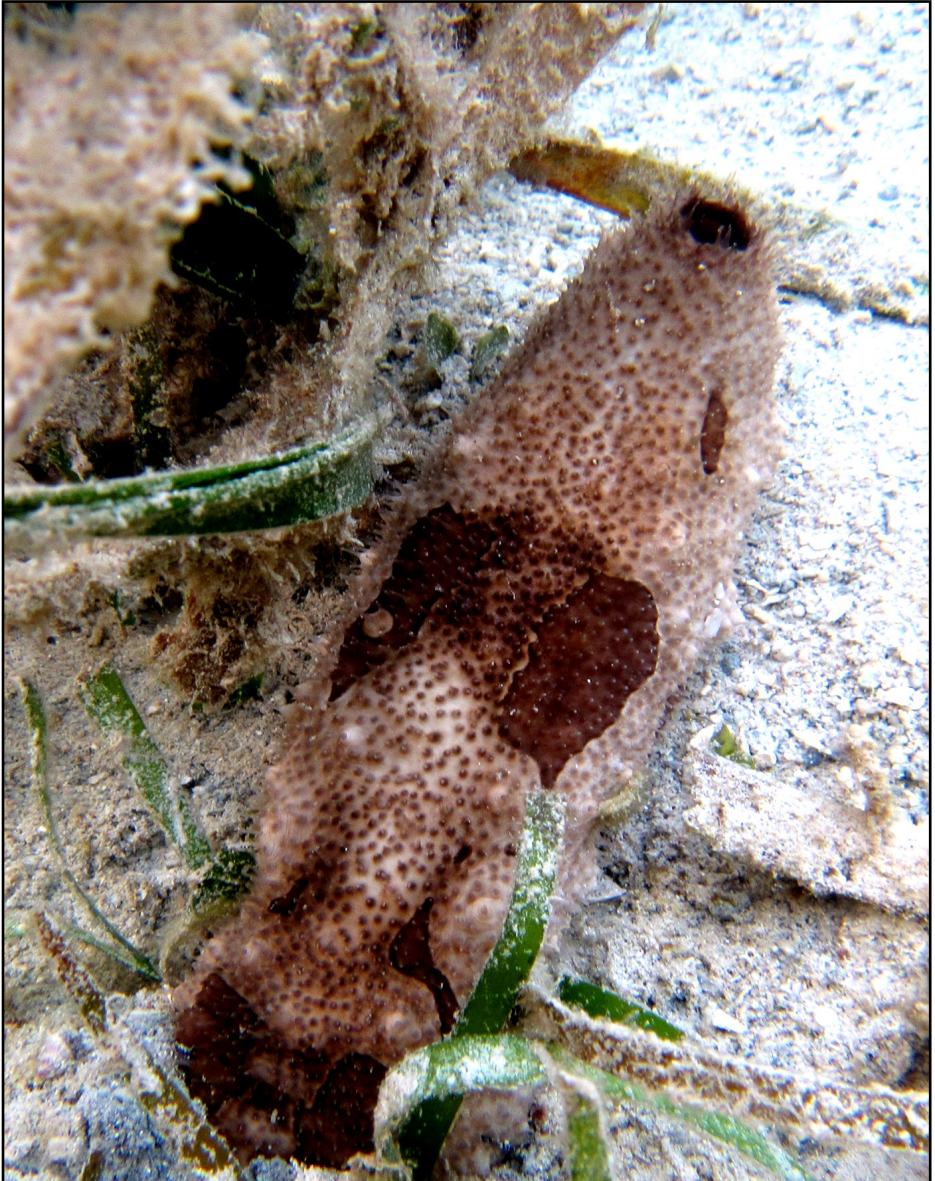
Common Name:	Brown-spotted sandfish
Local Name:	Lawayan, tagukan, hangad-langit
IUCN Status:	Data Deficient
Economic Value:	Low

Key Features:

- The dorsal is generally light brown or orange brown in color with dark brown spots and blotches. There is also a yellow variant with brown blotches (inset photo).
- With numerous, long slender papillae.
- It inhabits shallow seagrass beds.
- Maximum size: 26 cm
- Common size: 15 cm

Palawan, Philippines





Common variant of *Bohadschia marmorata*.



Juveniles of *Bohadschia marmorata* measuring ~ 6 cm.

Family Holothuriidae



Bohadschia koellikeri (Semper, 1868)

Common Name:	Mottled sea cucumber
Local Name:	Tagukan
IUCN Status:	Data Deficient
Economic Value:	Medium

Key Features:

- Generally light brown or creamy tan in color with brown blotches less defined than *Bohadschia marmorata* and do not cross the body as in the case of *B. vitiensis*.
- The body is smooth and arch dorsally but flattened ventrally.
- Easily ejects Cuvierian tubules.
- Maximum size: 32 cm
- Common size: 18 cm (Dolorosa 2015)

Palawan, Philippines



Family Holothuriidae



Bohadschia ocellata (Jaeger, 1833)

Common Name:	Polka-dotted sea cucumber
Local Name:	Matang-itik
IUCN Status:	No assessment yet
Economic Value:	Medium

Key Features:

- The dorsal is dark brown with white to brownish streaks.
- The body is a bit cylindrical and moderately long.
- It is collected by divers in shallow coral reefs.
- Maximum size: 50 cm
- Common size: 30 cm

▲ Palawan, Philippines



Family Holothuriidae



Bohadschia vitiensis (Semper, 1868)

Common Name:	Brown sandfish
Local Name:	Lawayan-tabla, legs-legs
IUCN Status:	Data Deficient
Economic Value:	Medium

Key Features:

- The color varies from beige to orange-brown with numerous small brown spots.
- The body is generally stout.
- The mouth is ventral with anus always dorsal.
- It often burries in the sediment and comes out as tide ebbs.
- It inhabits shallow seagrass beds and shallow coral reefs with sandy substrates.
- Maximum size: 40 cm
- Common size: 30 cm



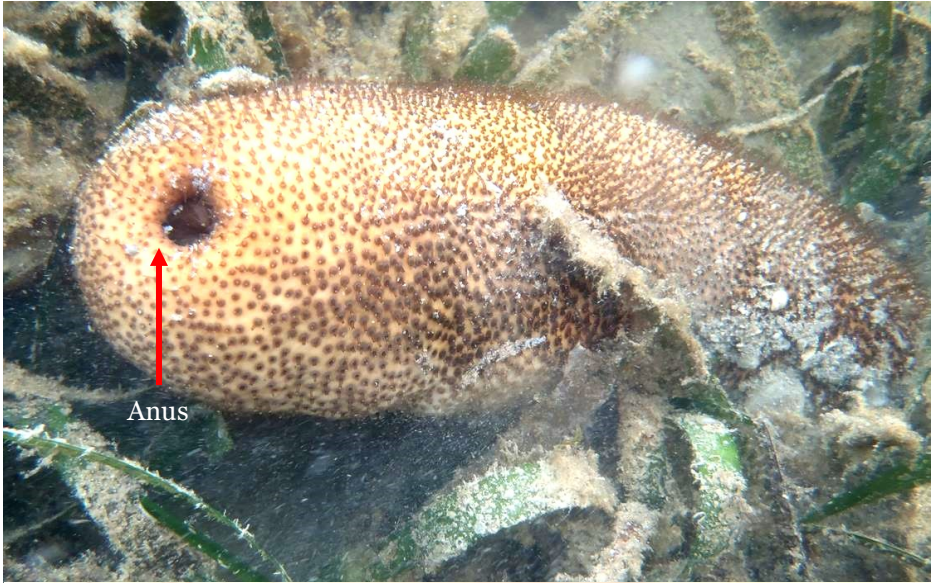
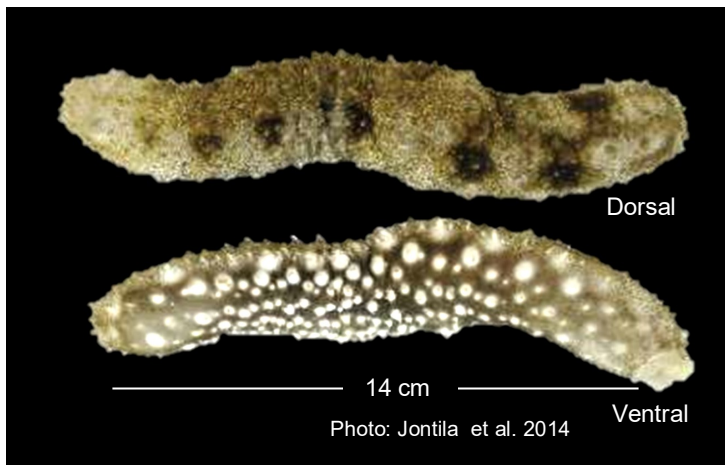


Photo: RG Dolorosa

Variants of *Bohadschia vitiensis*.

Family Holothuriidae



Holothuria albiventer (Semper, 1868)

Common Name:	Beige sea cucumber
Local Name:	Mani-mani
IUCN Status:	Data Deficient
Economic Value:	Low

Key Features:

- The color is beige to light brown.
- The body is slender and elongated.
- Its dorsal has dark brown patches arranged in two rows along the body.
- The ventral portion has white spots that appeared to be as podia (photo).
- It is found in shallow seagrass beds.
- Maximum size: 14 cm
- Common size: 10 cm

Palawan, Philippines



Family Holothuriidae



Holothuria arenicola (Semper, 1868)

Common Name:	Sand sea cucumber
Local Name:	Batunan
IUCN Status:	Data Deficient
Economic Value:	Low, consumed fresh, not processed

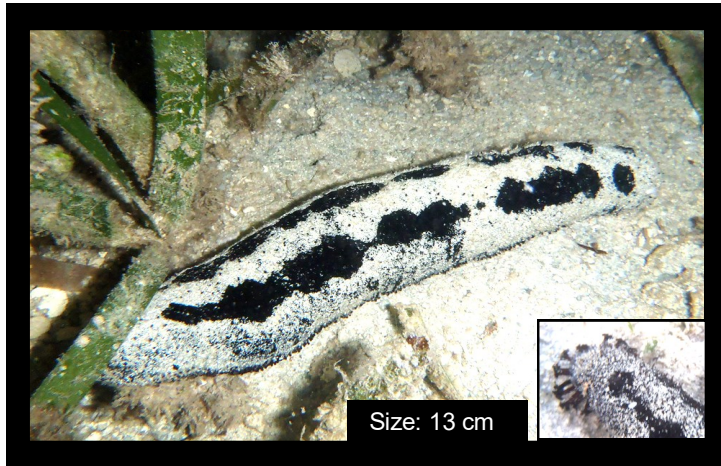
Key Features:

- The color varies from beige to orange-brown.
- The shape is elongated with small brown dots scattered around the body.
- Always burry and comes out during low tide at night.
- It is found in shallow, sandy-seagrass beds.
- Maximum size: 30 cm
- Common size: 10 cm (Purcell et al. 2023)

Palawan, Philippines



Family Holothuriidae



Holothuria atra (Jaeger, 1833)

Common Name:	Lollyfish
Local Name:	Black beauty
IUCN Status:	Least Concern
Economic Value:	Low

Key Features:

- It is uniformly black in color but appears to be always covered with fine sand, except for large specimen (right photo)
- The body is elongated, slimy and emits red coloration when rubbed.
- The tentacles are black in color (inset).
- It is found in seagrass beds, corals reefs and reef flats .
- Maximum size: 100 cm (Dolorosa 2015)
- Common size: 20 cm



Sand-free *Holothuria atra* in Tubbataha Reefs Natural Park measuring about 100 cm.

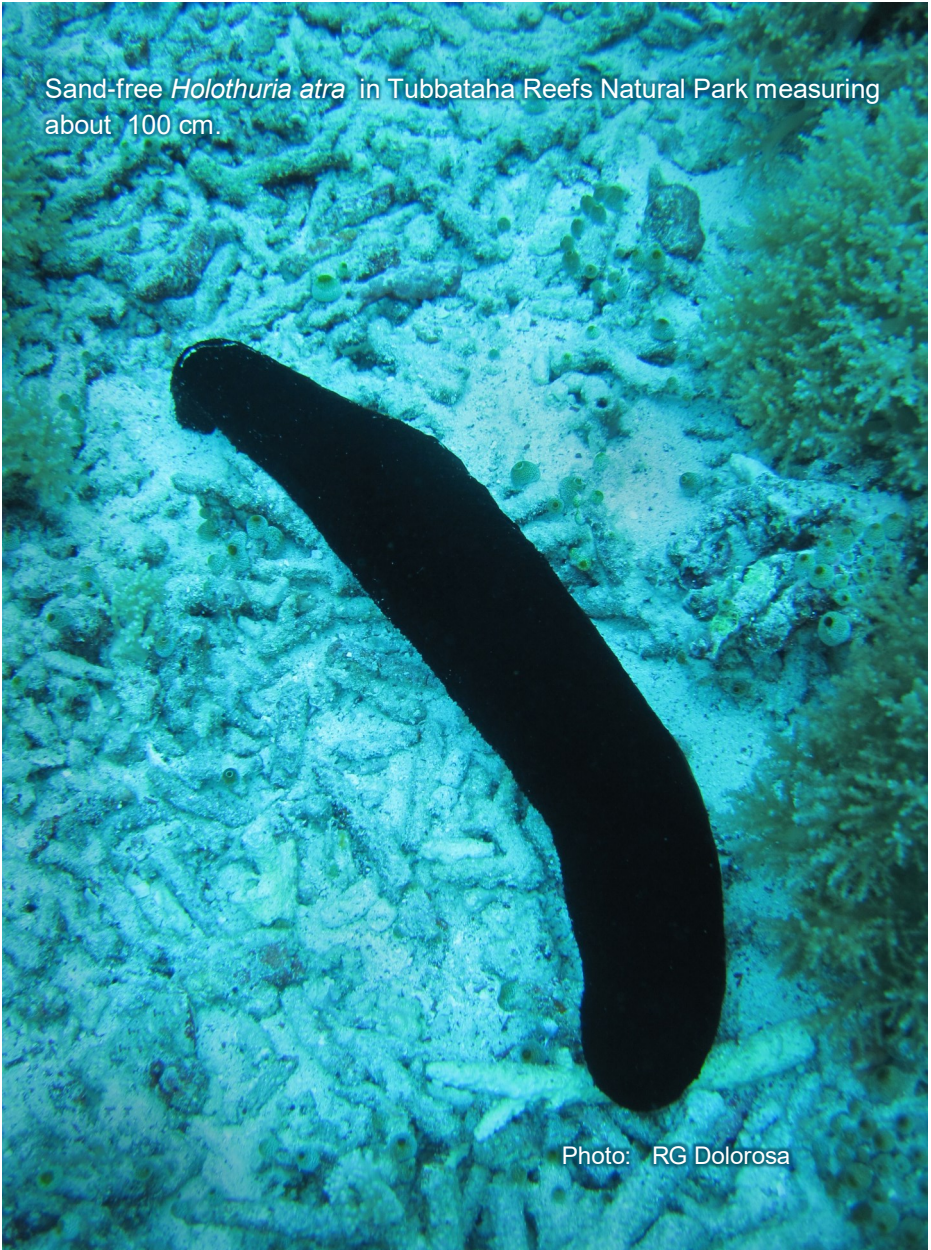
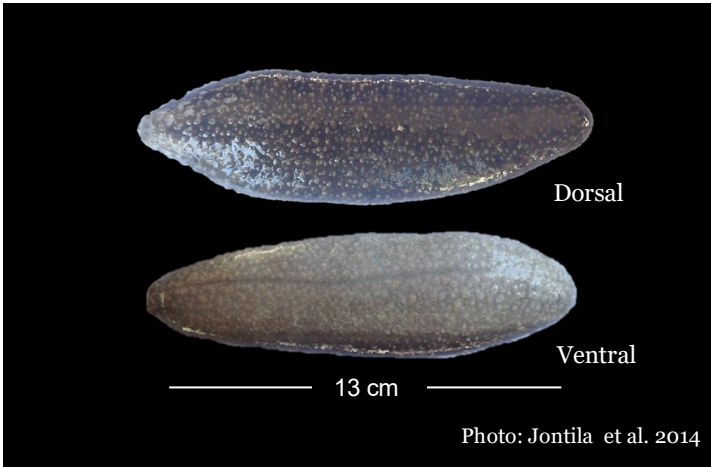


Photo: RG Dolorosa

Family Holothuriidae



Holothuria cavans (Massin & Tomascik, 1996)

Common Name:	Unknown
Local Name:	Unknown
IUCN Status:	Data Deficient
Economic Value:	Unknown

Key Features:

- The entire body is black in color and slimy.
- The papillae around the body appeared as small dots when taken out of the water.
- It is found in shallow seagrass beds.
- Maximum size: Unknown
- Common size: 13 cm



Family Holothuriidae



Holothuria coluber (Semper, 1868)

Common Name:	Snakefish
Local Name:	Tambor, Patola white, Black powder
IUCN Status:	Least Concern
Economic Value:	Low

Key Features:

- The color range from dark grey to black.
- The dorsal has numerous yellow-tipped papillae.
- The ventral has distinct white to yellowish podia (inset photo).
- Usually hide in crevices and is hard to pull out.
- Inhabit shallow coral reefs and reef flats.
- Maximum size: 60 cm
- Common size: 35 cm



Family Holothuriidae



Holothuria edulis (Lesson, 1830)

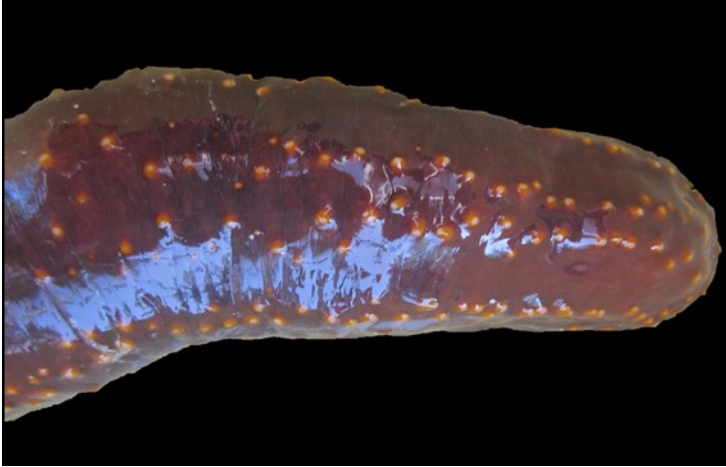
Common Name:	Pink fish
Local Name:	Red beauty, Hotdog, Lipstikan
IUCN status:	Least concern
Economic Value:	Low

Key Features:

- The dorsal is uniformly black in color while the ventral is pink.
- The body is subcylindrical and slightly flattened ventrally.
- It is found in shallow coral reefs with hard and sandy substrates.
- Maximum size: 38 cm
- Common size: 18 cm



Family Holothuriidae



Holothuria flavomaculata (Jaeger, 1833)

Common Name:	Red snakefish
Local Name:	Unknown
IUCN Status:	Least Concern
Economic Value:	Low

Key Features:

- The body is reddish or brownish-red in color.
- It has prominent yellow papillae arranged in rows along the dorsal part of the body.
- It is collected in shallow coral reef areas.
- Maximum size: 60 cm*
- Common size: 35 cm
*Jontila unpub.



Family Holothuriidae

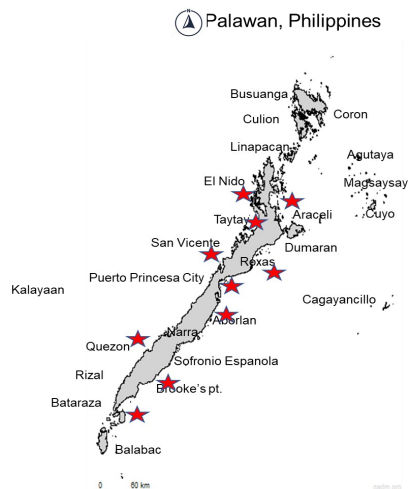


Holothuria fuscocinerea (Jaeger, 1833)

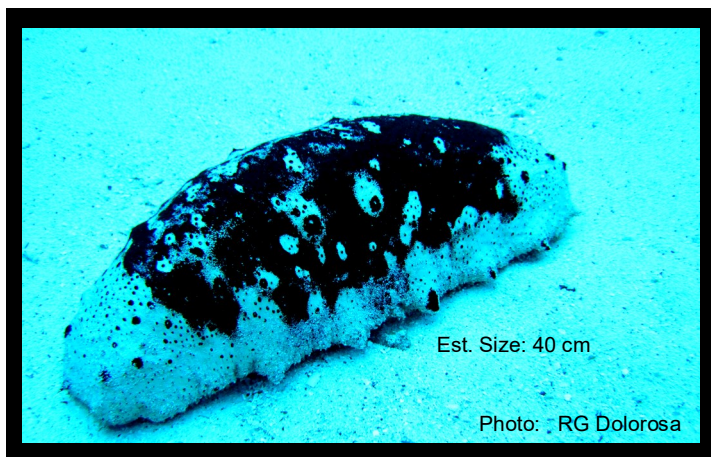
Common Name:	Unknown
Local Name:	Labuyo
IUCN Status:	Least Concern
Economic Value:	Low

Key Features:

- The color is generally orange-brown to brown on the dorsal and becoming light in the ventral.
- It easily ejects Cuvierian tubules when disturbed.
- Always bury in the sand and comes out only during low tide.
- Inhabits shallow seagrass beds.
- Maximum size: 30 cm
- Common size: 20 cm



Family Holothuriidae



Holothuria fuscogilva (Cherbonnier, 1980)

Common Name:	White teatfish
Local Name:	Susuan
CITES:	Appendix II
IUCN Status:	Vulnerable
Economic Value:	High

Key Features:

- The dorsal is almost black in color with white patches.
- The body is robust, stout, and is strongly flattened ventrally.
- The teats protrude on the sides.
- Found in sandy patches of coral reefs.
- Maximum size: 57 cm
- Common size: 28 cm

Palawan, Philippines



Family Holothuriidae

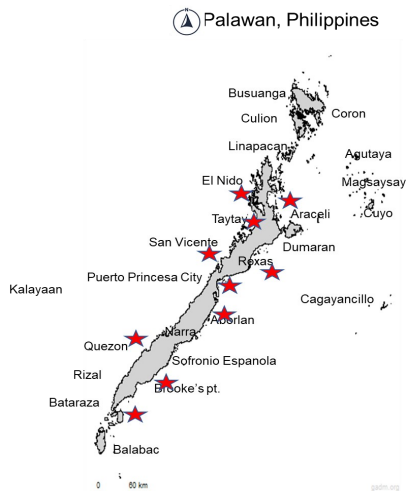


Holothuria fuscopunctata (Jaeger, 1833)

Common Name:	Elephant trunkfish
Local Name:	Sapatos
IUCN Status:	Least Concern
Economic Value:	Medium

Key Features:

- The dorsal has brown spots with rustic to orange-brown in color, fading and becoming white towards the ventral part.
- The dorsal part is also characterized by deep wrinkles with dark brown coloration.
- The body is thick and strongly flattened ventrally.
- Collected in coral reefs.
- Maximum size: 70 cm
- Common size: 40 cm



Family Holothuriidae



Holothuria gracilis (Semper, 1868)

Common Name:	Unknown
Local Name:	Unknown
IUCN Status:	Data Deficient
Economic Value:	Low

Key Features:

- The dorsal color varies from grey to orange-brown.
- The ventral is consistently light somewhat whitish in color.
- With yellow-orange papillae surrounding the moderately sized-body that is arched ventrally.
- Easily ejects Cuvierian tubules when slightly disturbed.
- Collected in coral reef areas.
- Maximum size: Unknown
- Common size: 18 cm



Family Holothuriidae



Holothuria hilla (Lesson, 1830)

Common Name:	Tiger-tail sea cucumber
Local Name:	Mani-mani, Bat-tuli
IUCN Status:	Least Concern
Economic Value:	Not commercially exploited

Key Features:

- The color is generally orange to orange-brown dotted with large light yellow papillae.
- The ventral portion is lighter in color with visible whitish to yellowish podia.
- The body is elongated though arched ventrally when disturbed.
- Collected in shallow coral reefs and reef flats.
- Maximum size: 25 cm
- Common size: 15 cm



Family Holothuriidae



Holothuria impatiens (Forskål, 1775)

Common Name:	Impatient sea cucumber
Local Name:	Sunlot
IUCN Status:	Data Deficient
Economic Value:	Low

Key Features:

- The color is brown with transverse bands of darker, almost black along the body.
- Some have transverse bands that become spots arranged in two rows towards posterior end (Purcell et al. 2012).
- The body is elongated.
- Nocturnal
- Sighted in seagrass beds.
- Maximum size: 26 cm
- Common size: 15 cm

📍 Palawan, Philippines



Family Holothuriidae



Holothuria leucospilota (Brandt, 1835)

Common Name:	White threadfish
Local Name:	Patola
IUCN Status:	Least Concern
Economic Value:	Low

Key Features:

- The color is entirely black.
- The body is elongated and moderately long with length ranging from 25-40 cm, and sometimes covered with fine sand.
- The dorsal is covered with relatively long, distinct papillae.
- Sighted in reef flats, seagrass beds and in mangrove areas with sandy substrate.
- Maximum size: 50 cm
- Common size: 30 cm



Family Holothuriidae




Holothuria lineata (Ludwig, 1875)

Common Name:	Unknown
Local Name:	Unknown
IUCN Status:	Data Deficient
Economic Value:	Not commercially exploited

Key Features:

- The dorsal is cream in color with light brown longitudinal band arranged in three rows, with series of dark brown dots arranged in two lines.
 - The body is elongated and tapers towards the mouth. Collected in sandy seagrass beds.
 - Maximum size: 12 cm*
 - Common size: 6 cm
- * Jontila unpub.

 Palawan, Philippines



Family Holothuriidae



Holothuria notabilis (Ludwig, 1875)

Common Name:	Unknown
Local Name:	Unknown
IUCN Status:	Data Deficient
Economic Value:	Not commercially exploited

Key Features:

- The tegument is brown to black in color with whitish dots.
- The shape is cylindrical and tapered at the anus.
- The dorsal has long and slender papillae while the ventral has numerous long yellow to green podia.
- Recorded in seagrass beds.
- Maximum size: 32 cm
- Common size: 8 cm



Family Holothuriidae



Holothuria pardalis (Selenka, 1867)

Common Name:	Unknown
Local Name:	Unknown
IUCN Status:	Least Concern
Economic Value:	Low

Key Features:

- The body color is beige to light yellowish, with two rows of dark spots and numerous tiny dark spots.
- Papillae are short, dark brown, and conical in shape.
- Found in reef flats and shallow coral reefs.
- Maximum size: 25 cm
- Common size: 10 cm

Palawan, Philippines



Family Holothuriidae




Holothuria pervicax (Selenka, 1867)

Common Name:	Unknown
Local Name:	Unknown
IUCN Status:	Least Concern
Economic Value:	Low

Key Features:

- The body color is cream with distinct four greenish-brown blotchy bands across.
- The dorsal is somewhat sprinkled with white-tipped papillae.
- The ventral part is whitish in color with numerous, large podia. Also reported to have a grey to brown body coloration (Purcell et al. 2012).
- Found in coral reefs.
- Maximum size: 35 cm
- Common size: 18 cm

 Palawan, Philippines



Family Holothuriidae



Holothuria scabra (Jaeger, 1833)

Common Name:	Sand fish
Local Name:	Curtido, Kiskisan, Putian
IUCN Status:	Endangered
Economic Value:	High

Key Features:

- The color varies from grey to light brown to black.
- The body is oval, arched dorsally and moderately flattened.
- The dorsal has greyish-black transverse lines.
- The ventral is white or light grey with fine, dark spots.
- Common in seagrass beds and inner reef flats.
- Maximum size: 40 cm
- Common size: 18 cm

▲ Palawan, Philippines



Family Holothuriidae



Holothuria sp.

Common Name:	Unknown
Local Name:	Unknown
IUCN Status:	Not Listed
Economic Value:	Low, consumed fresh

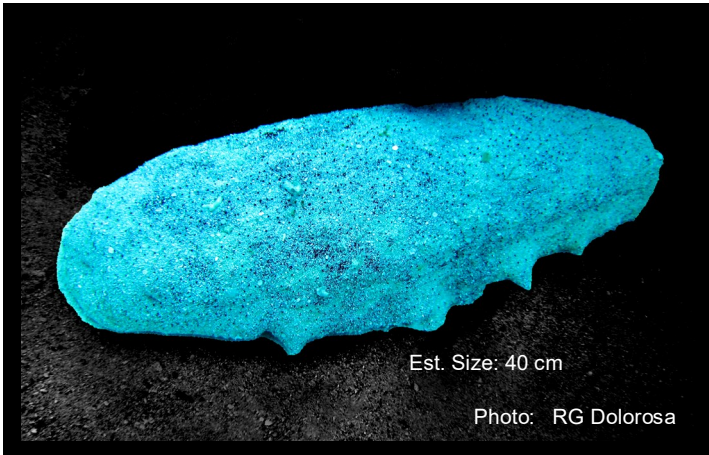
Key Features:

- The body is entirely dark brown in color, thin and elongated.
 - The tegument is soft and slimy all over.
 - Eaten raw or prepared as “kinilaw” or pickled .
 - Collected in rocky intertidal areas.
 - Maximum size: 21 cm*
 - Common size: 15 cm
- *Jontila unpub.

📍 Palawan, Philippines



Family Holothuriidae



Holothuria whitmaei (Bell, 1887)

Common Name:	Black teatfish
Local Name:	Susuan, Bakungan
CITES:	Appendix II
IUCN Status:	Endangered
Economic Value:	High

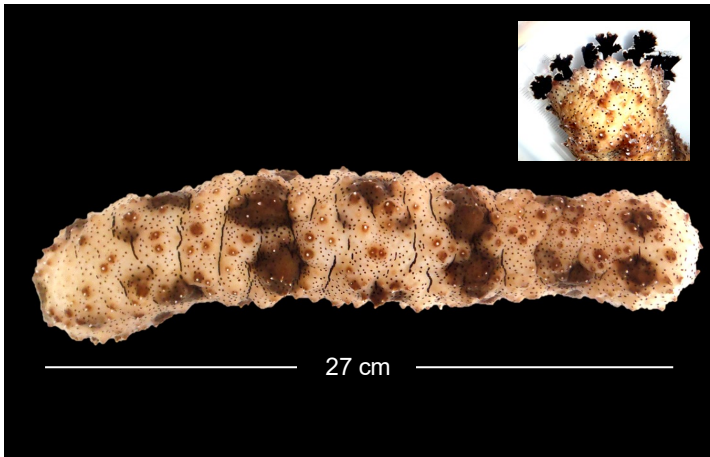
Key Features:

- The body is uniformly black in color and the dorsal is usually covered with fine sand.
- It has 5-10 protrusions or “teats” on the lateral margins of the ventral part (Purcell et al. 2012).
- Collected by divers in coral reefs.
- Maximum size: 54 cm
- Common size: 23 cm

📍 Palawan, Philippines



Family Holothuriidae



Pearsonothuria graeffei (Semper, 1868)

Common Name:	Flower fish
Local Name:	Mani-mani, Flower
IUCN Status:	No assessment yet
Economic Value:	Low

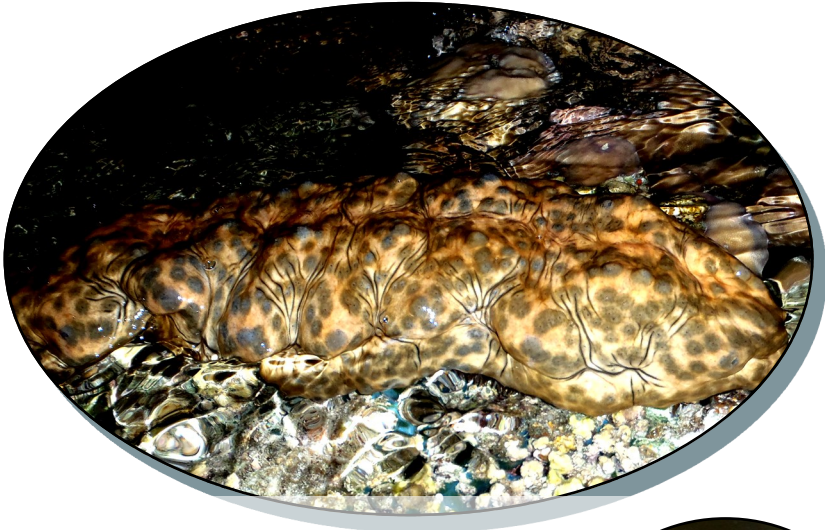
Key Features:

- The body color is cream with large brown patches and smaller light brown dots all over.
- The tentacles are distinctively black in color having white color at the edge.
- Common in coral reefs.
- Maximum size: 45 cm
- Common size: 18 cm

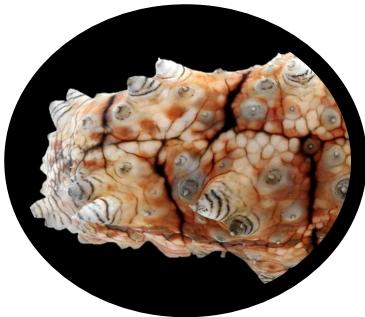


Order Synallactida

Family Stichopodidae



- Species under this family have medium to large-sized body, often with angular cross-section and is flattened ventrally.
- With 20 peltate tentacles.



- Mouth is ventral and anus is terminal.

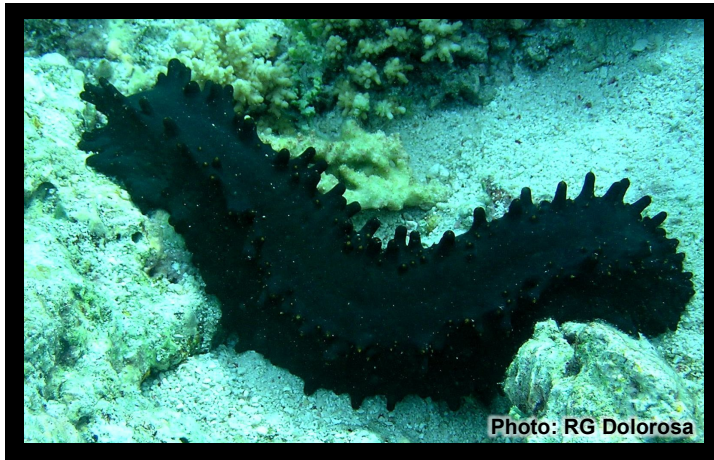


- Some have tubercles or papillae all over the body.

- Commonly found in coral reefs and reef flats with some occurring in seagrass beds.

- Fleshy but easily melts when taken out of the water.

Family Stichopodidae




Stichopus chloronotus (Brandt, 1835)

Common Name:	Green fish
Local Name:	Cuatro cantos
IUCN Status:	Least Concern
Economic Value:	High

Key Features:

- The body of live specimen is dark green to black in color.
- The papillae are long and conical and are arranged on both sides of the dorsal surface and along the lateral margins of the lower side (Purcell et al. 2012).
- Common in coral reefs edges .
- Maximum size: 35 cm
- Common size: 20 cm

 Palawan, Philippines



Family Stichopodidae



Stichopus hermanni (Semper, 1868)

Common Name:	Curry fish
Local Name:	Mani-mani, Hanginan
IUCN Status:	Vulnerable
Economic Value:	High

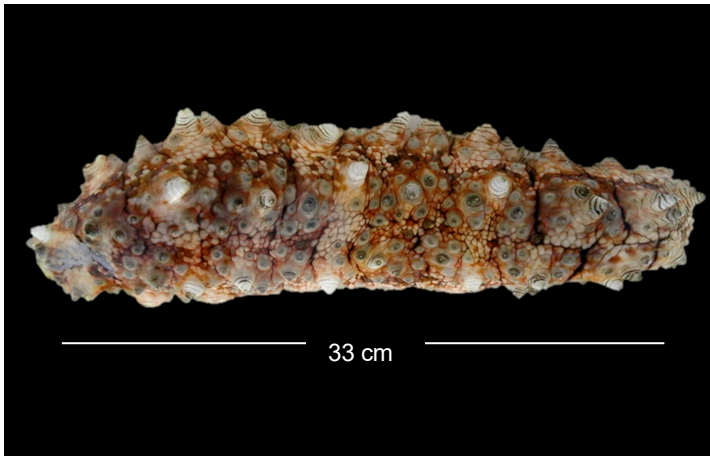
Key Features:

- Generally yellow in color, with a tint of green in some individuals.
- The body is relatively firm and flattened ventrally, with grey to dark brown spots on the dorsal. Some papillae are large and warty, bordered by dark rings.
- Mature individuals have prominent cleavage across the body.
- Common in seagrass beds.
- Maximum size: 55 cm
- Common size: 31 cm

▲ Palawan, Philippines



Family Stichopodidae



Stichopus horrens (Selenka, 1868)

Common Name:	Selenka's sea cucumber
Local Name:	Hanginan
IUCN Status:	Data Deficient
Economic Value:	High

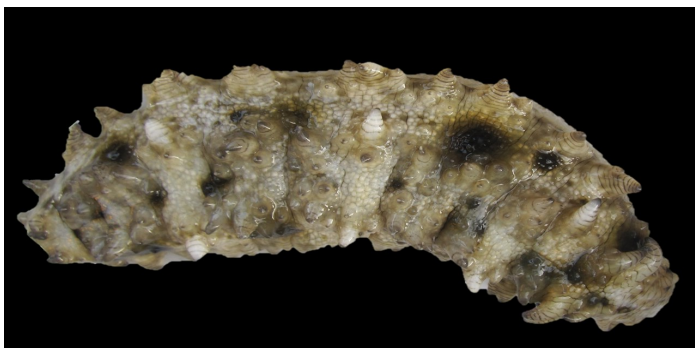
Key Features:

- The body color varies among species from grey to beige to orange brown.
 - Distinguished by large conical papillae arranged in two rows on the dorsal and also on the lower sides.
 - Found in coral reefs at depths between 3-10 m.
 - Maximum size: 43 cm*
 - Common size: 30 cm
- * Jontila unpub.

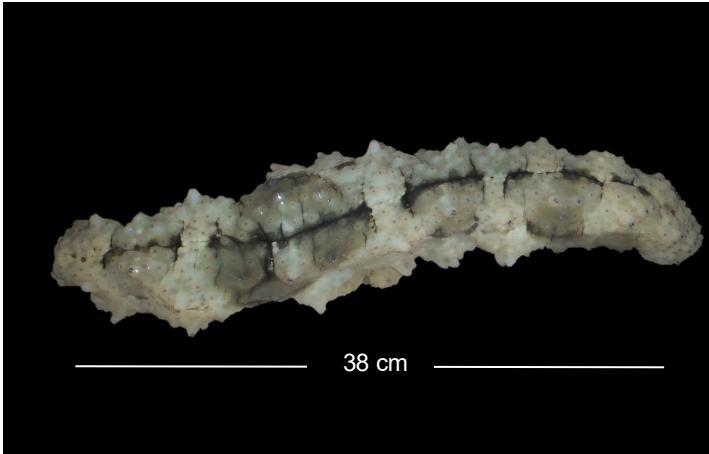


Family Stichopodidae

Variants of *Stichopus horrens* from Johnson Is., Roxas, Palawan.



Family Stichopodidae



Stichopus monotuberculatus (Quoy and Gaimard, 1833)

Common Name:	Unknown
Local Name:	Hanginan
IUCN Status:	Data Deficient
Economic Value:	High

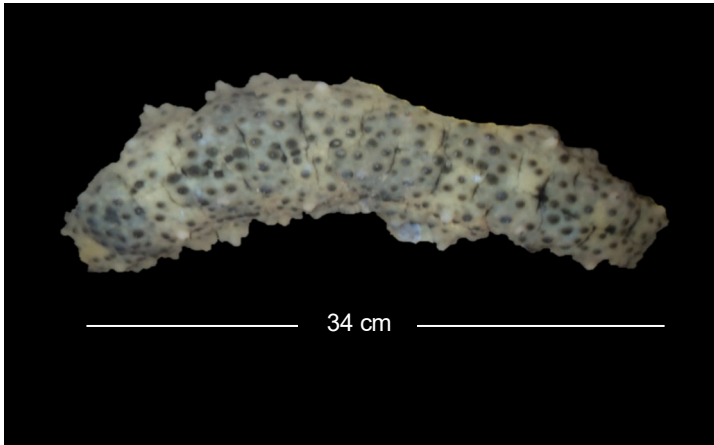
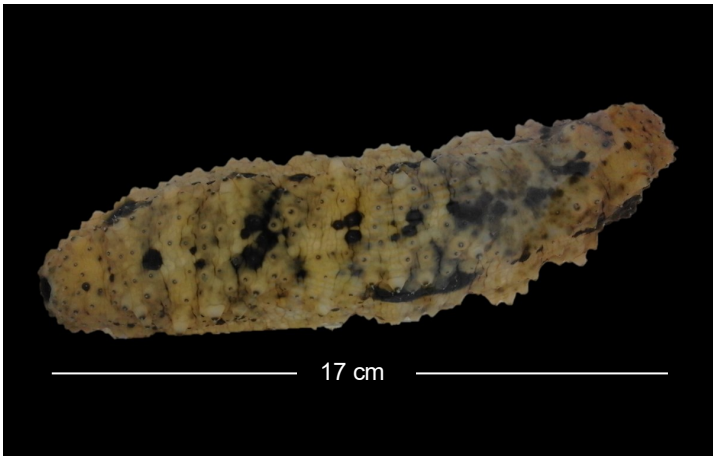
Key Features:

- The body is generally grey in color with tint of beige or yellow in some individuals.
- Flattened ventrally.
- The dorsal has dark brown blotches or spots usually forming two distinct transverse bands along the body.
- Common in coral reefs.
- Maximum size: 38 cm
- Common size: 20 cm

▲ Palawan, Philippines



Family Stichopodidae



The specimen above (*Stichopus aff. monotuberculatus*) has creamy to yellowish coloration with large black round dots on its entire dorsal area. It also has a chunky appearance similar to *S. monotuberculatus*, though the transverse band is not distinct.

Family Stichopodidae



Stichopus noctivagus (Cherbonnier, 1980)

Common Name:	Night-wandering sea cucumber
Local Name:	Hanginan
IUCN Status:	Least Concern
Economic Value:	Medium

Key Features:

- The color is generally pink with whitish streaks and reddish-brown spots on the dorsal.
- The papillae are long and slender.
- The body is generally soft and easily melts when taken out of the water, much sensitive than other *Stichopus* species.
- Recorded in coral reefs.
- Maximum size: 40 cm*
- Common size: 26 cm
- *Jontila unpub.

Palawan, Philippines



Family Stichopodidae



Stichopus ocellatus (Massin, Zulfigar, Hwai & Boss, 2002)

Common Name:	Ocellated sea cucumber
Local Name:	Hanginan
IUCN Status:	Data Deficient
Economic Value:	High

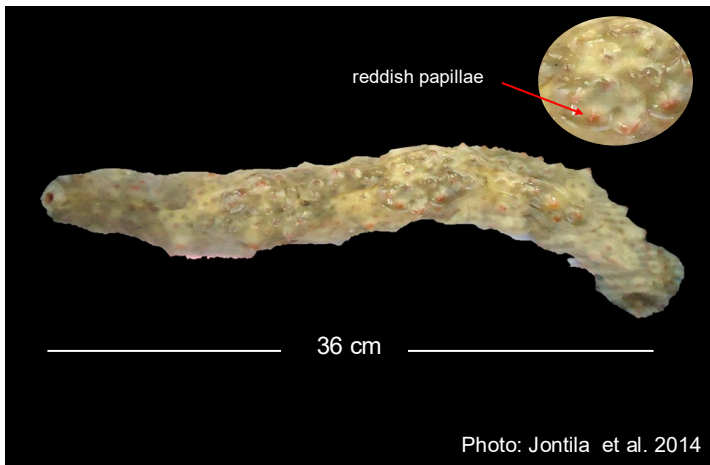
Key Features:

- The color ranges from yellow to orange with tint of yellow. It has large, greenish warty-like papillae with white base on the dorsal.
- Some individuals have distinct transverse cleavage.
- Collected from shallow coral reefs.
- Maximum size: 33 cm
- Common size: 23 cm

Palawan, Philippines



Family Stichopodidae



Stichopus quadrifasciatus (Massin, 1999)

Common Name:	Unknown
Local Name:	Hanginan
IUCN Status:	Data Deficient
Economic Value:	High

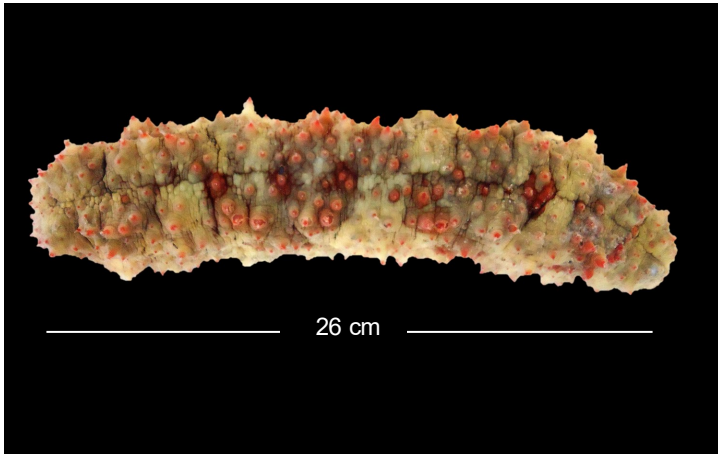
Key Features:

- The body is yellowish with brownish patches on the dorsal.
- The shape is extremely elongated.
- The tips of the papillae are red in color.
- Inhabits shallow coral reefs.
- Maximum size: Unknown
- Common size: 36 cm

Palawan, Philippines



Family Stichopodidae



Stichopus rubermaculosus (Massin, Zulfigar, Hwai & Boss, 2002)

Common Name:	Unknown
Local Name:	Hanginan
IUCN Status:	Data Deficient
Economic Value:	High

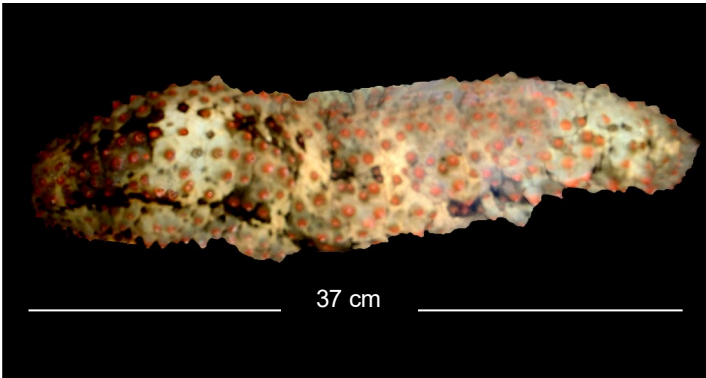
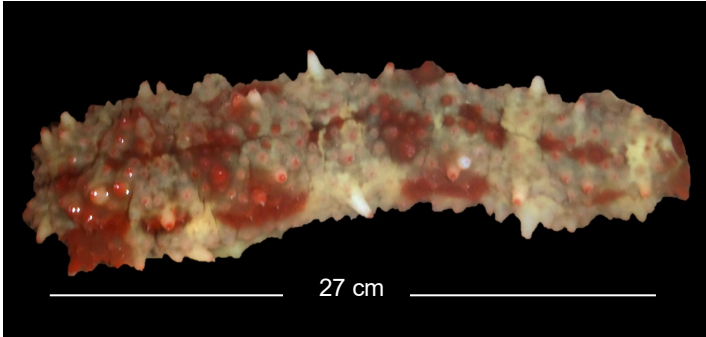
Key Features:

- The color ranges from light to dark brown with large papillae that always have red tips.
 - The color pattern is highly variable and the only consistent distinguishing feature is the uniform red color papillae (Maasin et al. 2002).
 - Inhabit shallow coral reefs.
 - Maximum size: 34 cm*
 - Common size: 26 cm
- *Jontila unpub.



Family Stichopodidae

Variants of *Stichopus rubermaculosus* from Johnson Is., Roxas, Palawan.



Family Stichopodidae



Stichopus sp.

Common Name:	Unknown
Local Name:	Hanginan
IUCN Status:	Not Listed
Economic Value:	Medium

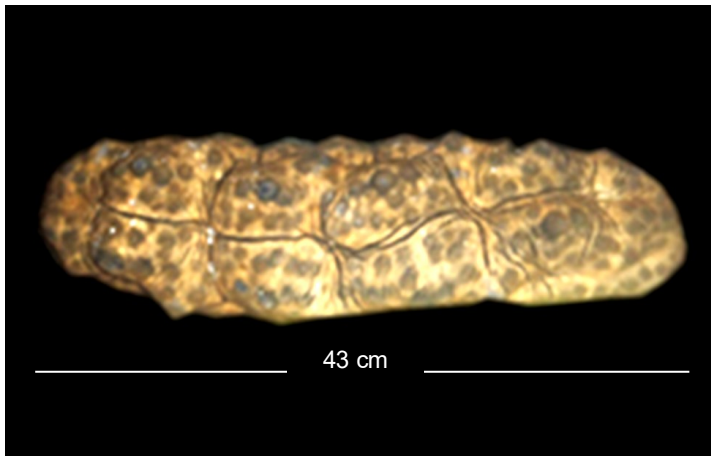
Key Features:

- The body is whitish to greyish in color.
 - The papillae are circular in shape and greenish in color with red dots at the center.
 - Collected from coral reefs.
 - Maximum size: 37 cm*
 - Common size: 32 cm
- *Jontila unpub.

Palawan, Philippines



Family Stichopodidae



Stichopus vastus (Sluiter, 1887)

Common Name:	Curry fish
Local Name:	Emag, Hanganan
IUCN Status:	Least Concern
Economic Value:	Medium

Key Features:

- The body color ranges from golden-brownish to olive green with tint of golden yellow.
 - The base of the papillae has fine dark line giving them a puzzle-like appearance.
 - The puzzle-like papillae separate from each other and eventually disintegrate when taken out of the water.
 - Inhabits coral reefs.
 - Maximum size: 54 cm*
 - Common size: 33 cm
- *Jontila unpub.



Family Stichopodidae



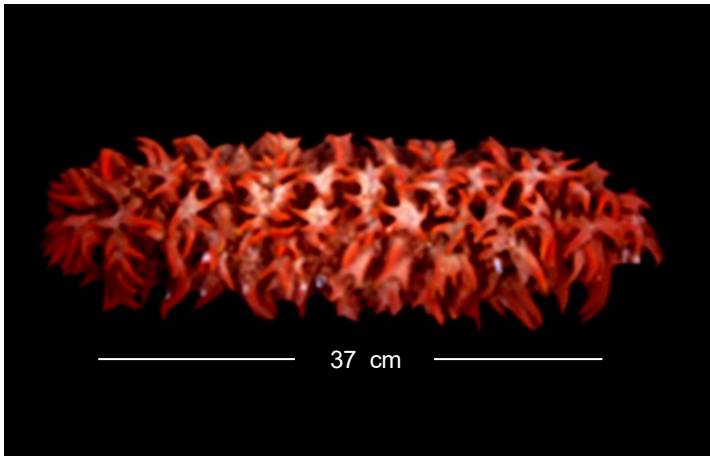
Stichopus vastus (Dorsal)



Stichopus vastus (Ventral)

Stichopus vastus has deep transverse wrinkles on the dorsal with yellow-orange interambulacral on its ventral.

Family Stichopodidae



Thelenota ananas (Jaeger, 1833)

Common Name:	Prickly redfish
Local Name:	Talipan, Tinikan
CITES:	Appendix II
IUCN status:	Endangered
Economic Value:	High

Key Features:

- The color varies from red to red-orange.
- The papillae are very large that are conical or starshaped.
- The ventral part is lighter in color.
- Inhabits coral reefs between 1-25 m.
- Maximum size: 80 cm
- Common size: 50 cm





Photo: RG Dolorosa

Variant of *Thelenota ananas* in deep waters of Tubbataha Reefs Natural Park, Cagayancillo, Palawan, Philippines.

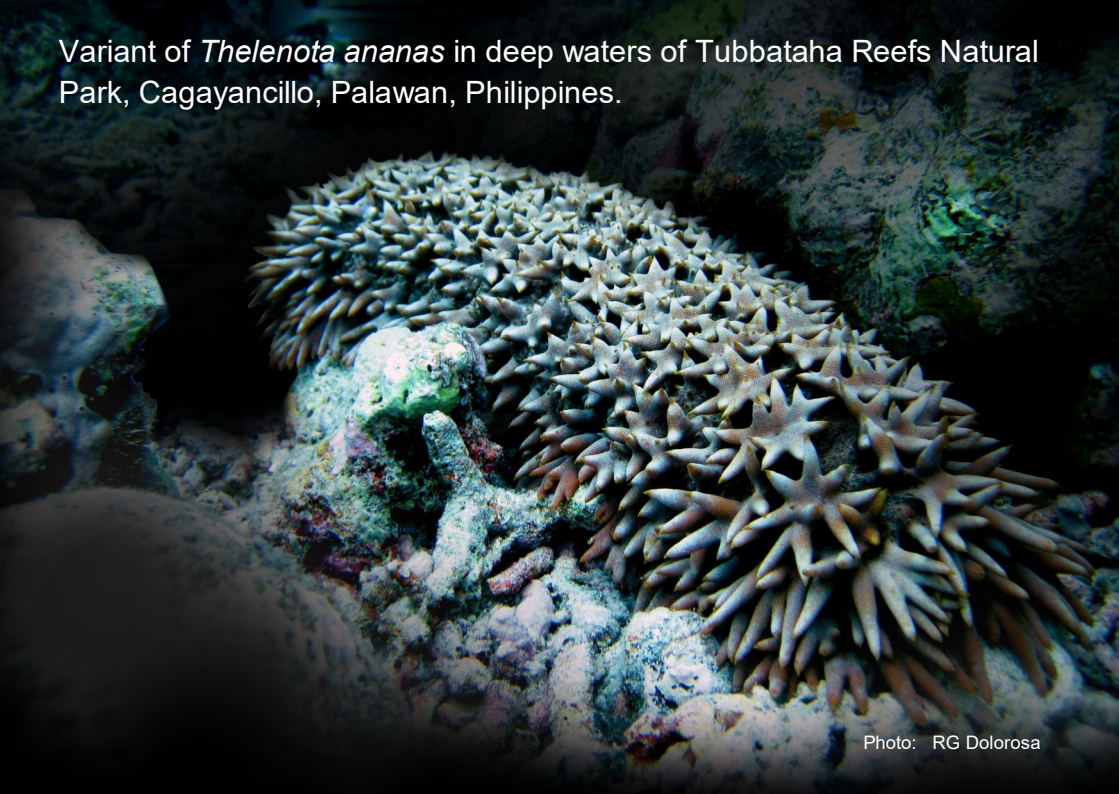


Photo: RG Dolorosa

Family Stichopodidae



Thelenota anax (Clark, 1921)

Common Name:	Amber fish
Local Name:	Legs
CITES:	Appendix II
IUCN Status:	Data Deficient
Economic Value:	Low

Key Features:

- The body is extremely large (Adult >50 cm).
- The color varies from white beige to grey light or brown.
- The dorsal has blotches with dark brown or reddish spots.
- With wart-like bumps along side of the dorsal.
- Inhabits coral reef areas at about 10 m deep.
- Maximum size: 89 cm
- Common size: 50 cm

Palawan, Philippines



Family Stichopodidae



Photo: J Selgrath

Thelenota rubralineata (Jaeger, 1833)

Common Name:	Lemonfish, Candy cane sea cucumber
Local Name:	Talipan, Tinikan
CITES:	Appendix II
IUCN Status:	Data Deficient
Economic Value:	High

Key Features:

- The body has striking complex pattern of crimson lines (Purcell et al. 2012).
- With large, conical, fleshy papillae having brownish or yellowish tips.
- Inhabit coral reefs.
- Maximum size: 50 cm
- Common size: 30 cm

📍 Palawan, Philippines



Order Apodida

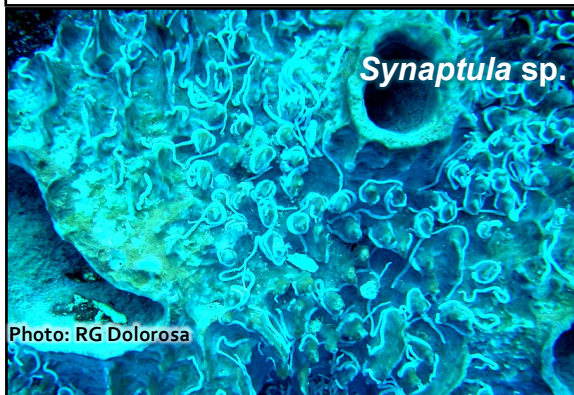
Family Synaptidae



- Species under this family have no feet.
- The body is elongated, generally worm or snake-like in shape.
- Some could reach up to 3 m (*Synapta maculata*).
- Commonly found in seagrass beds and coral reefs.
- Neither consumed locally nor processed into *trepang*.



Family Synaptidae



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ABOUT THE AUTHOR



By blood and by birth, the author is an *Ilongga* with a heart of a *Palaweña*.

She spent her early childhood in the remote yet amazing coast of Sowangan, Quezon, Palawan, Philippines, where her profound love for the ocean is deeply rooted. Living nearby the beach, it is in the sand that she was taught how to write her name. It is with the use of sea shells that she learned how to count. It is in the bounty of sea that sustained them as her mother's meager salary as a newbie public teacher seemed to be swept away by waves. And it is for selling

her father's catch before going to school that taught her and her siblings to persevere in life.

At present, Dr. Jean Beth S. Jontila is an Associate Professor at the College of Fisheries and Aquatic Sciences of Western Philippines University in Puerto Princesa City, Philippines. She earned her degree in BS Fisheries at the University of the Philippines in the Visayas, her MS Marine Biology at Western Philippines University, and studied again at UP Visayas for her PhD in Fisheries. Prior to joining the Academe, Dr. Jontila was with WWF-Philippines working in Tubbataha Reefs Natural Park, Cagayancillo and Balabac. She is specializing on sea cucumbers but also works on Small-Scale Fisheries, Marine Protected Areas, Coastal Resource Management and Marine Ecology and Ecosystems. She published several papers in reputable journals and also served as a Lead Researcher of Blue Communities Project funded by the United Kingdom Global Challenges Research Fund. Additionally, Dr. Jontila acted as a Project Leader for a number of projects funded by the Commission on Higher Education and the Department of Science and Technology. Likewise, she served as a resource person and consultant in her field of expertise including as technical expert in an environmental case in Palawan. All these while taking care of her plants, four children and Nashley-a 14-year old *Aspin*, with the help of her lifetime debate-coffee-partner, Atty. Jansen I. Jontila.

