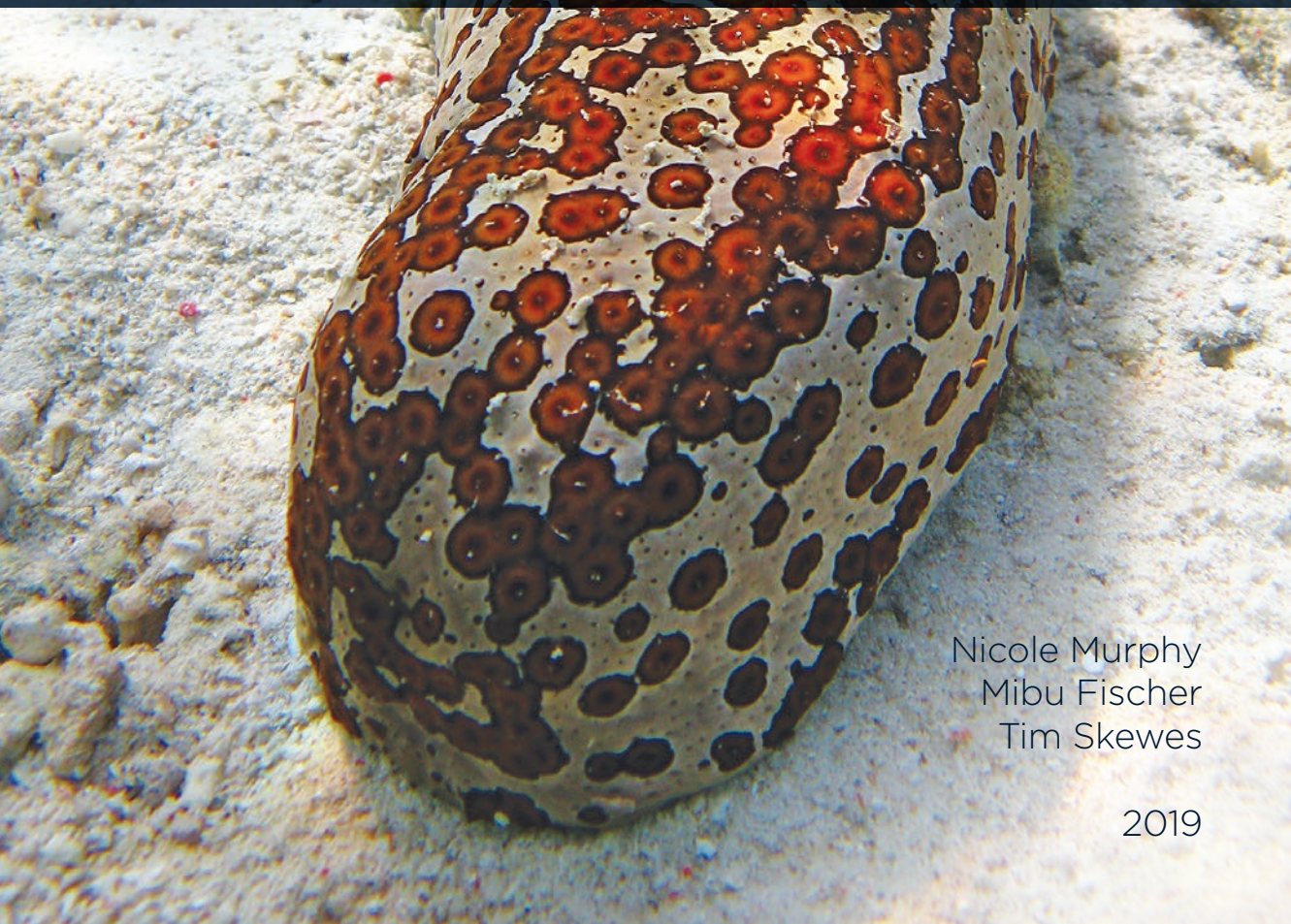
Torres Strait Beche-de-mer (Sea cucumber) species ID guide



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2019

Sea cucumber species information sourced from the SPC, FAO Species Catalogue, FAO Fish Finder and from the additional reference list (page 56).

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Images source: CSIRO unless stated otherwise.

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Updated Minimum Size Limits - February 2022

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Important disclaimer

Contents

The sea cucumber fishery in Torres Strait is a potentially valuable source of income for locals, especially those living in Eastern Torres Strait where the Tropical Rock Lobster fishery is less active.

Twenty-three commercial sea cucumber species have been recorded in Torres Strait, with only a small proportion of the higher value species fished. The main species fished are Sandfish, Redfish and Black teatfish. High value species are harvested more regularly than medium and low value species, putting them at risk of over fishing.

A sea cucumber species guide is needed to help managers and fishers correctly identify sea cucumbers, and is important for sustainable fishing and management of sea cucumbers in Torres Strait. This will result in more certainty in survey and logbook data entries and compliance with fishery regulations, in particular Total Allowable Catch (TAC) and size limits.

Beach price of beche-de-mer product varies depending on processing quality, with sea cucumber appearance, shape, colour and odour affecting value. A post capture handling guideline for sea cucumbers, including steps for short term storage and transport of product for final processing into beche-de-mer was developed for Torres Strait.

A large portion of sand in the ocean has been 'cleaned' through the gut of a sea cucumber.

Torres Strait sea cucumbers are found in varying habitats and have a number of beneficial impacts on their environment, and to the ecosystem. These include: Bioturbation, Nutrient recycling, Food chain value and as Host species.

Bioturbation - Is the ingestion, excretion and burrowing within sediments. This process 'cleans' the sediments; sea cucumbers eat the sand and the sand that is excreted is cleaner. Organic matter in the sediment is also mixed through burrowing (mainly by Sandfish), which in turn increases production of important primary producers eg. sea grass. An individual sea cucumber can clean a vast amount of sand in a year, which is vital to ecosystem health. Too much organic matter in coastal benthic systems can lead to low oxygen levels, as well as increasing harmful algae species that out grow and dominate other species.

Nutrient recycling - Is when sea cucumbers excrete phosphates and nitrates, which are absorbed by microalgae and bacteria, enriching them with nutrients, that sea cucumbers then in-turn consume, creating a cycle.

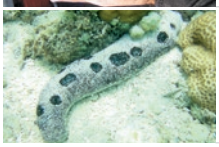
Food chain value - Sea cucumbers are thought to have a positive effect for coral production, as they alkalize the water from sediment cleaning. This creates a 'buffer' for corals, particularly in areas of low water flow.

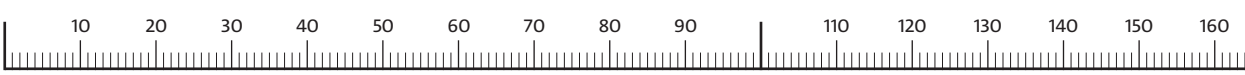
Host species - Sea cucumbers are host to numerous species, both parasites and commensals (organisms that live on, or in another without causing harm). Many parasite species that live within and on sea cucumbers are believed to only survive due to this relationship. There are nine species of fish that are known to find refuge inside a sea cucumber (including Lollyfish), mainly in the digestive tract. Some even use this space as part of their life-cycle.

Circle of life - Sea cucumbers are preyed upon by several other species, including sea stars and fish.

These environmental and ecosystem benefits only happen when sea cucumbers occur in good numbers.

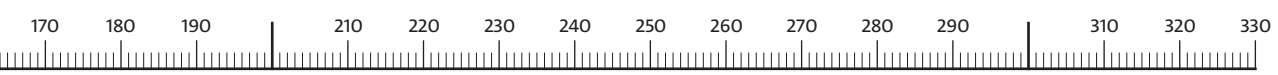
Summary table of species

Image	Common and Islander Name	Scientific Name	Commercial Value	Minimum Size Limits (mm)*	Page
	Deepwater redfish ‘Mamam Aber’	*Actintopyga echinites*	Medium	200	8
	Surf redfish ‘Teraber’	*Actintopyga mauritiana*	High	220	10
	Hairy blackfish ‘Musmus Aber’	*Actinopyga miliaris*	Medium	220	12
	Deepwater blackfish ‘Goleh-Goleh Aber’	*Actinopyga palauensis*	Medium	220	14
	Burrowing blackfish ‘Aospir Aber’	*Actinopyga spinea*	Medium	220	16
	Stonefish ‘Parak Aber’	*Actinopyga lecanora*	Medium	nil	18
	Leopardfish ‘Kepkep Aber’	*Bohadschia argus*	Medium	300	20
	Brown sandfish ‘Susus Aber’	*Bohadschia vitiensis*	Medium	250	22
	Lollyfish ‘Wehwehsor Aber’	*Holothuria atra*	Low	150	24



*Size limits off pzJa website – http://pzja.gov.au/the-fisheries/torres-strait-beche-de-mer-fishery/

Image	Common and Islander Name	Scientific Name	Commercial Value	Minimum Size Limits (mm)*	Page
	White teatfish ‘Zarzer Pauraber’	*Holothuria fuscogilva*	Medium	320	26
	Elephant trunkfish ‘Berber Aber’	*Holothuria fuscopunctata*	Low	240	28
	Golden sandfish ‘Sirid Aber’	*Holothuria lessoni*	High	220	30
	Sandfish ‘Burbur Aber’	*Holothuria scabra*	High	180	32
	Black teatfish ‘Pauraber or Goleh-Goleh Pauraber’	*Holothuria whitmaei*	High	250	34
	Greenfish ‘Kerir Aber’	*Stichopus chloronotus*	Medium	nil	36
	Curryfish (common) ‘Bambam Aber’	*Stichopus herrmanni*	Medium	310	38
	Curryfish vastus ‘Warwarr Aber’	*Stichopus vastus*	Medium	150	40
	Prickly redfish ‘Seker Aber’	*Thelenota ananas*	Medium	350	42



TORRES STRAIT BECHE-DE-MER SPECIES ID GUIDE

Identification guide

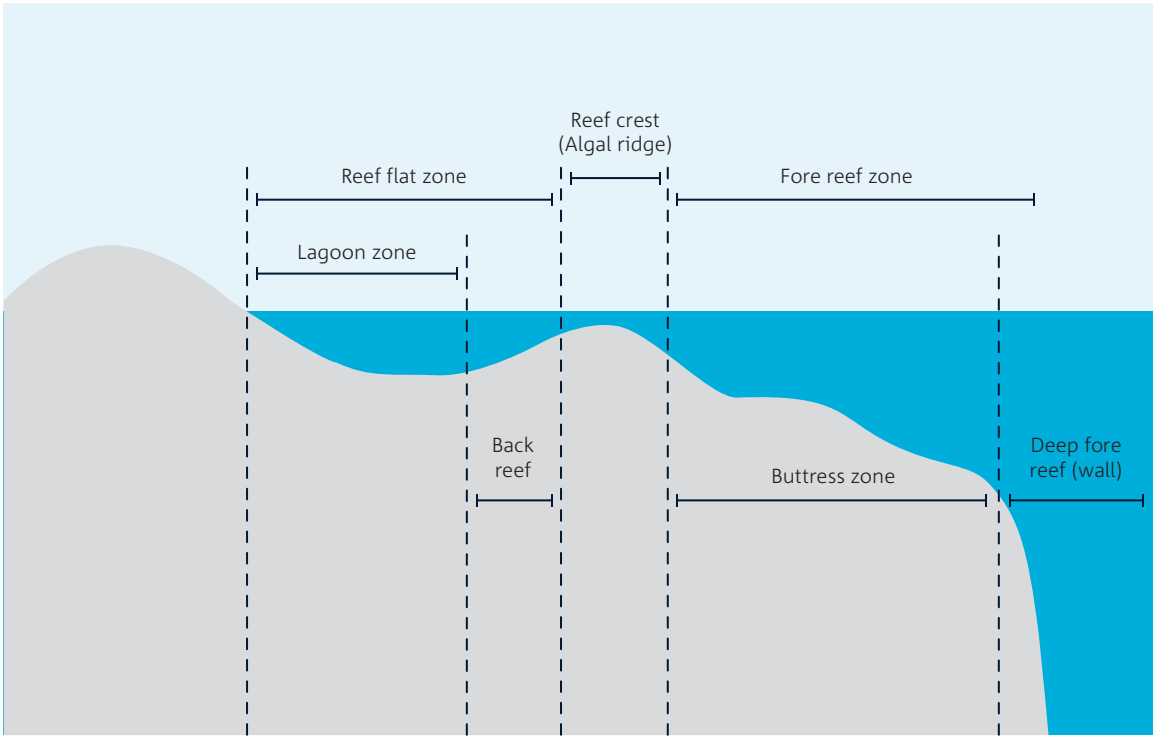
Key

Distribution

Darker shading represents higher distribution numbers

Cross hatch represents higher distrubution numbers

Habitat



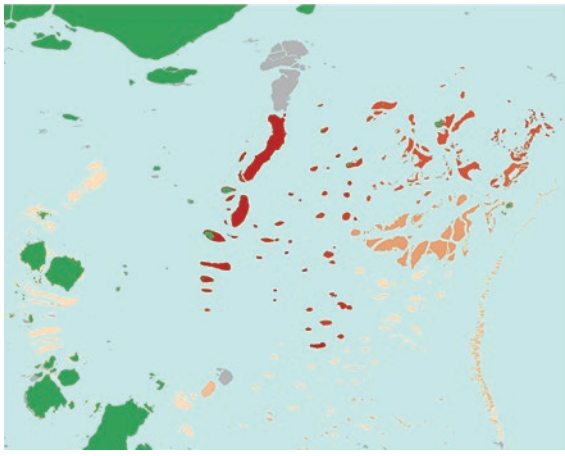
Deepwater redfish

Actinopyga echinites (Jaeger, 1833)

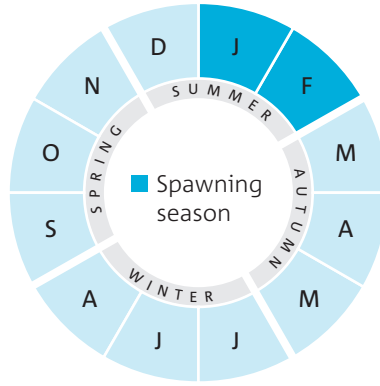
'Mamam Aber'

Minimum size limit (gutted or alive)	200 mm
Description	Brown, darker on dorsal surface, which also has pimpled texture Dorsal papillae long and slender Anus terminal with 5 brownish teeth Often covered with sand Commonly to 300 mm, max 350 mm
Size at maturity	90–120 mm
Where found	Coastal reefs in rubble, seagrass beds or sand between corals Moa Island, Orman Reefs, Darnley Island, Murray Island, Campbell Island, Aureed Island, Hannah Bank, Warrior Reef, Auwamaza Reef
Depth	0–10 m
Indicative Value	Medium
Comments	Widespread in moderate densities throughout Torres Strait and Warrior Reef

Distribution map from CSIRO surveys



Deepwater redfish (*A. echinites*) species distribution in Torres Strait



Rough surface covered in sand

***A. echinites*, Campbell Island, Torres Strait (CSIRO)**

***A. echinites*, Hannah Bank, Torres Strait (CSIRO)**

Anal teeth of *A. echinites* - brown in colour

Species it can be confused with

Surf Redfish

Rusty Brown with whitish blotches and spots. Rigid body with trapezoidal section. Anus terminal 5 white teeth. Commonly to 240 mm. Max 380 mm. Found Murray Island and Don Cay in Torres Strait.

Hairy blackfish

Brown to blackish dorsally, lighter brown ventrally. Body stout and cylindrical. Dorsal surface generally covered by mucus. Numerous long slender papillae giving 'hairy' appearance. Contracts to ball shape when disturbed. Anus terminal with 5 conical teeth. Commonly to 250 mm. Max 350 mm.

Surf redfish

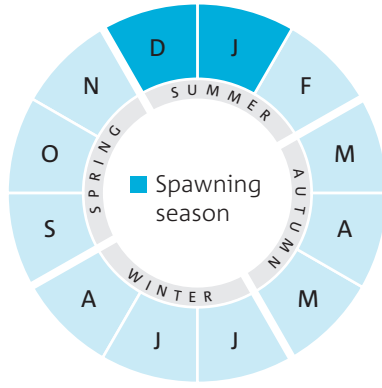
Actinopyga mauritiana (Quoy and Gaimard, 1833)

'Teraber'

Minimum size limit (gutted or alive)	220 mm
Description	Rusty brown with whitish spots typically around anus Rigid body with trapezoidal section Ventral surface with numerous podia Anus terminal with 5 white teeth Commonly to 240 mm, max 380 mm
Size at maturity	220–230 mm
Where found	Outer reefs, mostly in surf zone Murray Island, Don Cay
Depth	0–10 m
Indicative Value	Medium
Comments	Relatively uncommon in Torres Strait Great Barrier Reef and Coral Sea morphs have more whitish blotches and spots on ventral surface

Distribution map from CSIRO surveys

Surf redfish (*A. mauritiana*) species distribution in Torres Strait



A. mauritiana, **Murray Island, Torres Strait (CSIRO)**

Species it can be confused with

Deepwater Redfish

Brown, darker on dorsal surface, with pimpled texture. Dorsal papillae long. Anus terminal with 5 brownish teeth. Often covered with sand. Commonly to 150 mm. Max 360 mm.

Anal teeth of *A. mauritiana* - white in colour

A. mauritiana, **Coral Sea, photo courtesy of Tim Skewes**

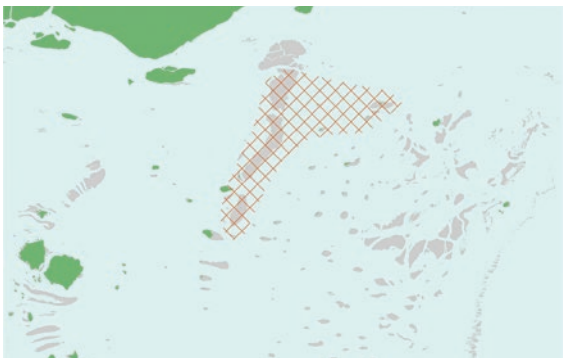
Hairy blackfish

Actinopyga miliaris (Quoy and Gaimard, 1833)

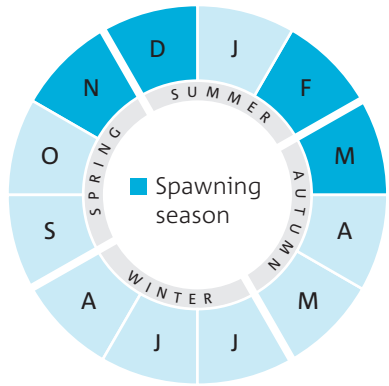
'Musmus Aber'

Minimum size limit (gutted or alive)	220 mm
Description	Brown to blackish dorsally, lighter brown ventrally Body stout and cylindrical Dorsal surface generally covered by mucus Numerous long slender papillae giving 'hairy' appearance Mouth ventral Anus terminal with 5 conical teeth Contracts to a ball shape when disturbed Commonly to 250 mm, max 350 mm
Size at maturity	120 mm
Where found	Sandy lagoons and reef flats Warrior Reef, Campbell Island
Depth	1–10 m, but mostly less than 4 m
Indicative Value	Medium
Comments	Not widespread but dense populations where found

Distribution map from CSIRO surveys



Hairy blackfish (*A. miliaris*) species distribution in Torres Strait



Looks ‘hairy’ (papillae)

Surface can have debris

***A. miliaris*, Warrior Reef, Torres Strait (CSIRO)**

Forms ball shape out of water

Anal teeth of *A. miliaris* - 5 ‘smoother’ cone shaped with spaces between. Photo courtesy of Steve Purcell

Species it can be confused with

Burrowing blackfish

Rusty brown to dark brown, often with fine sand dorsally. Sub-cylindrical body more elongate than *A. miliaris*. Anus subdorsal with 5 nodular teeth. Small thin papillae. Commonly to 300 mm. Max 400 mm.

Deepwater blackfish

Glossy brownish-black. Bumpy dorsal surface, upper dorsal usually covered in coarse sand. Sub-cylindrical body. Trunk like mouth often projected. Anus terminal with 5 serrated teeth. Small, sparse papillae. Commonly to 300 mm. Max 350 mm.

Deepwater blackfish

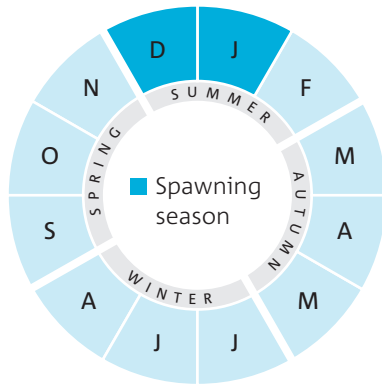
Actinopyga palauensis (Panning, 1944)

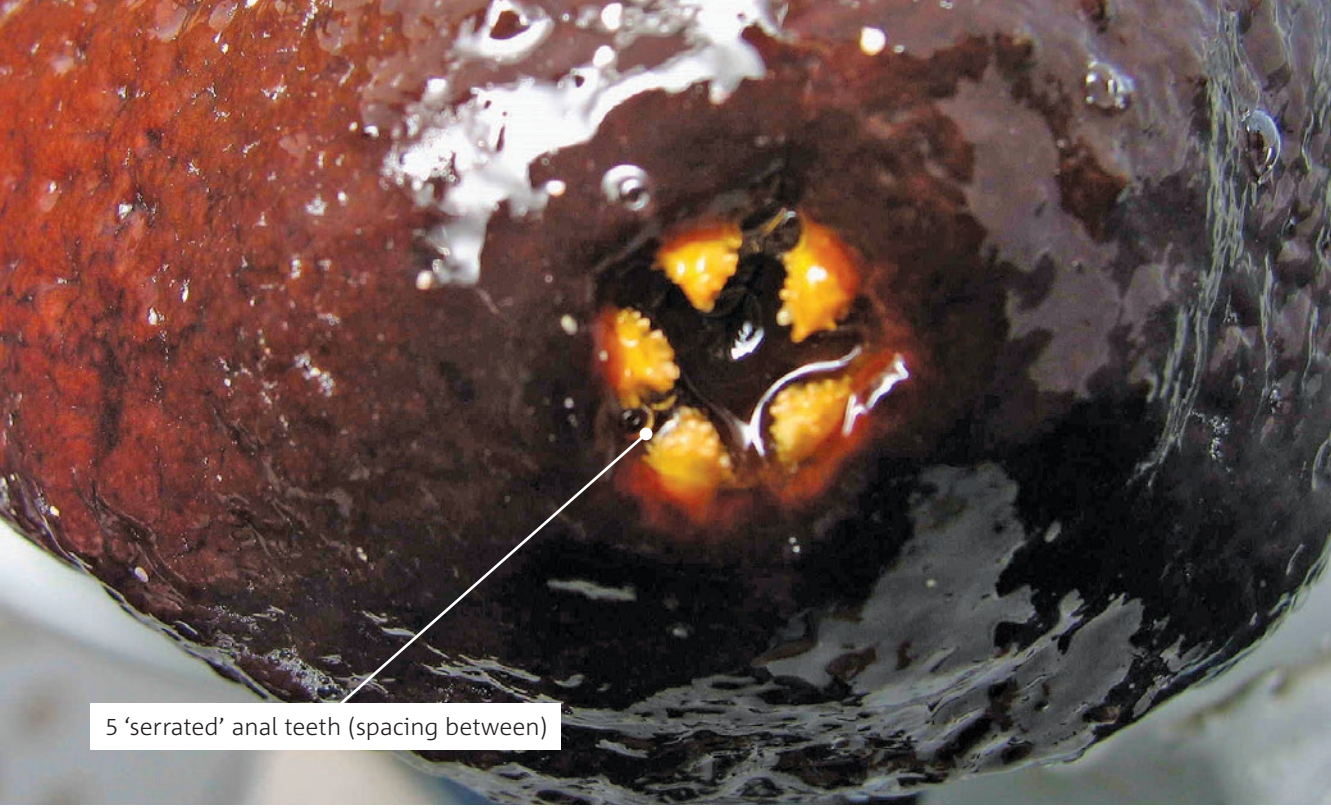
'Goleh-Goleh Aber'

Minimum size limit (gutted or alive)	220 mm
Description	Glossy brownish-black Bumpy surface with upper dorsal usually covered in coarse sand Sub-cylindrical body Mouth often projected and noticeably trunk-like Anus terminal with 5 serrated teeth Small, sparse papillae Commonly to 300 mm, max 350 mm
Size at maturity	Unknown
Where found	Reef passes and forereef pavement Murray Island Very uncommon
Depth	4–18 m
Indicative Value	Medium
Comments	Uncertain ID from Torres Strait Also called Chunky blackfish in the Queensland East Coast Sea Cucumber Fishery

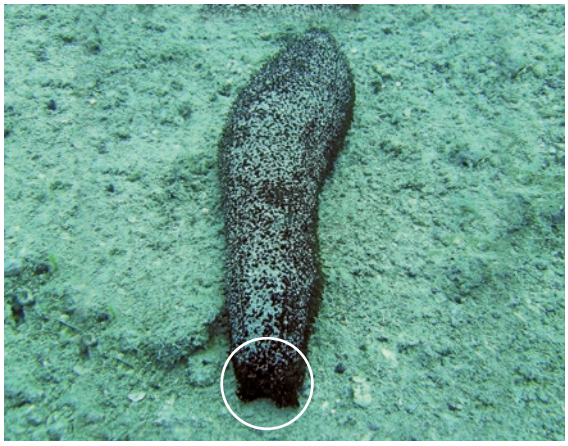
Distribution map from CSIRO surveys

Deepwater blackfish (*A. palauensis*) species distribution in Torres Strait





Anal teeth of *A. palauensis* (photo courtesy of Steve Purcell)



Protruding ‘mouth’ (proboscis) in water

***A. palauensis*, Murray Island, Torres Strait (CSIRO)**

Species it can be confused with

Hairy blackfish

Brown to blackish dorsally, lighter brown ventrally. Body stout and cylindrical. Dorsal surface generally covered by mucus. Numerous long slender papillae giving ‘hairy’ appearance. Contracts to ball shape when disturbed. Anus terminal with 5 conical teeth. Commonly to 250 mm. Max 350 mm.

Burrowing blackfish

Rusty brown to dark brown, often with fine sand dorsally. Sub-cylindrical body more elongate than *A. miliaris*. Anus subdorsal with 5 nodular teeth. Small thin papillae. Commonly to 300 mm. Max 400 mm.

Burrowing blackfish

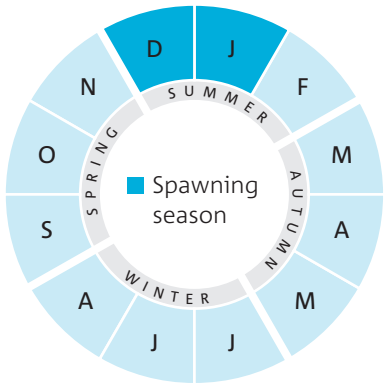
Actinopyga spinea (Cherbonnier, 1980)

'Aospir Aber'

Minimum size limit (gutted or alive)	220 mm
Description	Rusty brown to dark brown, often with fine sand dorsally Sub-cylindrical body, more elongate than hairy blackfish *(A. miliaris)* Anus subdorsal with 5 nodular teeth Small thin papillae Commonly to 300 mm, max 400 mm
Size at maturity	Unknown
Where found	Muddy-sand lagoons and reef flats Western side of Warrior Reef
Depth	1–20 m
Indicative Value	Medium
Comments	A. *spinea* also known as Burying blackfish (pers. comm. Steve Purcell)

Distribution map from CSIRO surveys

Burrowing blackfish (*A. spinea*) species distribution in Torres Strait

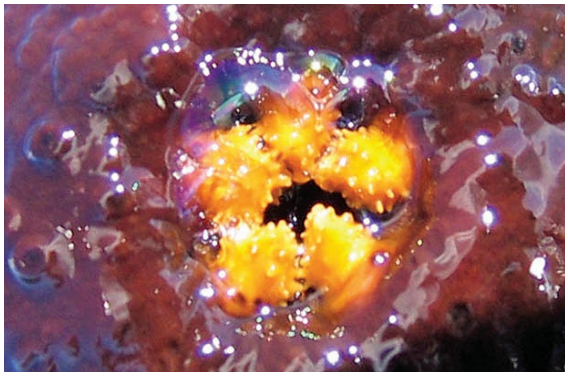


Animal forms ‘uneven’

Odd shape out of water

***A. spinea,* Auwamaza Reef, Torres Strait (CSIRO)**

Long cylinder in water with fine sand on top



Anal teeth of *A. spinea* - 5 ‘nodular’ and close together. Photo courtesy of Steve Purcell

Species it can be confused with

Hairy blackfish

Brown to blackish dorsally, lighter brown ventrally. Body stout and cylindrical. Dorsal surface generally covered by mucus. Numerous long slender papillae giving ‘hairy’ appearance. Contracts to ball shape when disturbed. Anus terminal with 5 conical teeth. Commonly to 250 mm. Max 350 mm.

Deepwater blackfish

Glossy brownish-black. Bumpy dorsal surface, upper dorsal usually covered in coarse sand. Sub-cylindrical body. Trunk like mouth often projected. Anus terminal with 5 serrated teeth. Small, sparse papillae. Commonly to 300 mm. Max 350 mm.

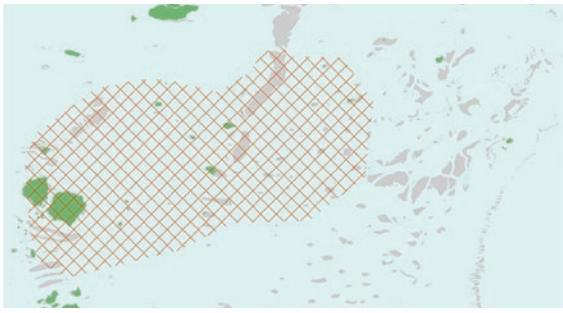
Stonefish

Actinopyga lecanora (Jaeger, 1833)

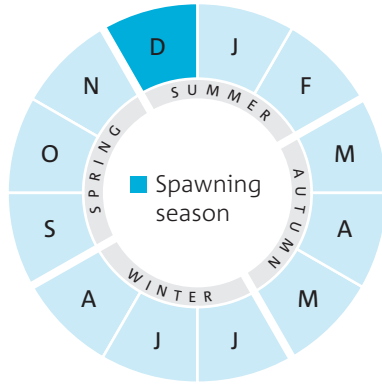
'Parak Aber'

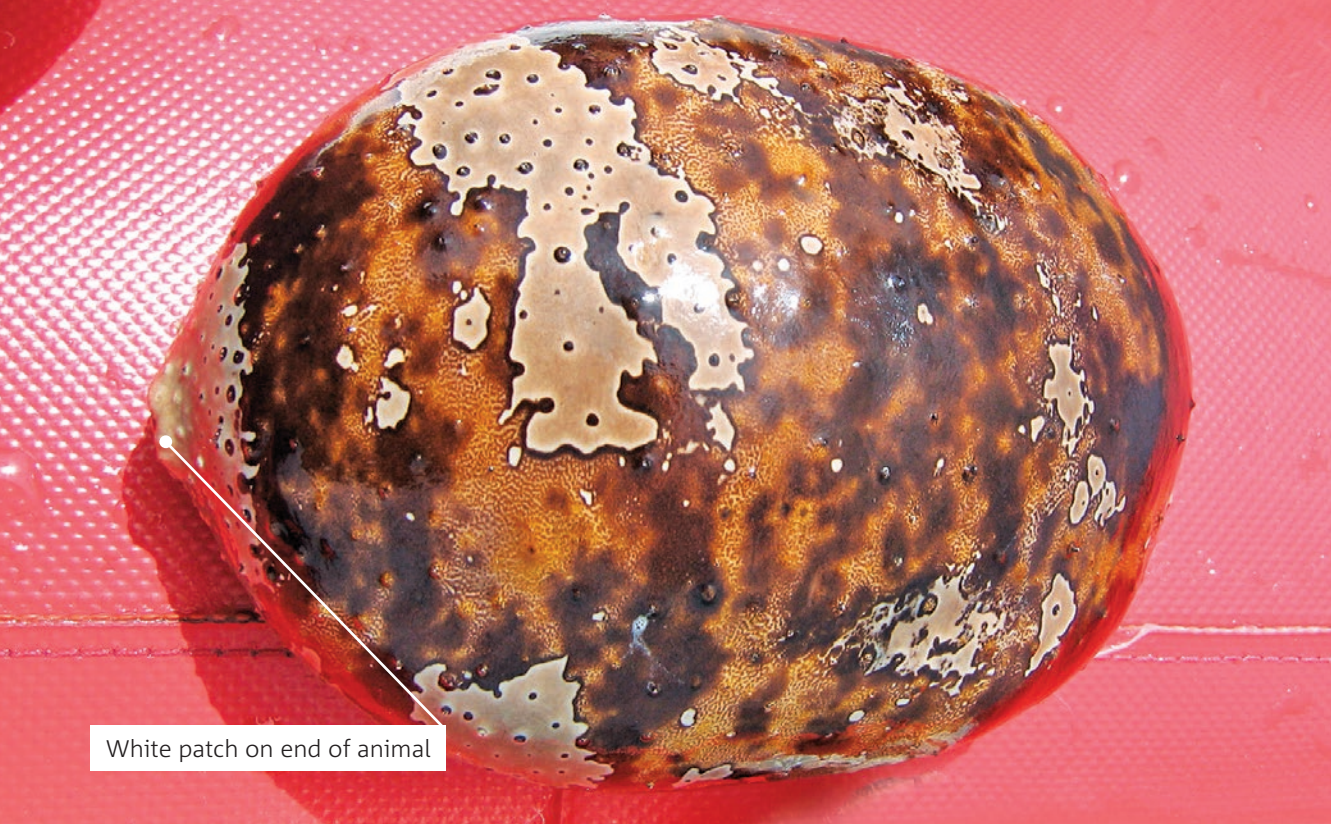
Minimum size limit (gutted or alive)	nil
Description	Beige to brown, sometimes marbled with whitish blotches Often has white patch around anus Cylindrical body, slightly flattened ventrally Stout and tapered at both ends Anus terminal with 5 blunt teeth Commonly to 220 mm, max 240 mm
Size at maturity	Unknown
Where found	Areas with live coral and coral rocks, and reef ledges Orman Reef, Mabuiag Island, Bet Reef, Buru Island, Tudu Island, Nagai Island Reasonably uncommon, found in deeper seabed from Warrior and western Torres Strait
Depth	0.5–7 m
Indicative Value	Medium
Comments	Appears to be 3 different forms (types) of this species These forms may be hybrids or different species Type 1 is the most common Are known to be relatively cryptic during the day

Distribution map from CSIRO surveys



Stonefish (*A. lecanora*) species distribution in Torres Strait





***A. lecanora,* Type 1, Mabuiag Island, Torres Strait (CSIRO)**

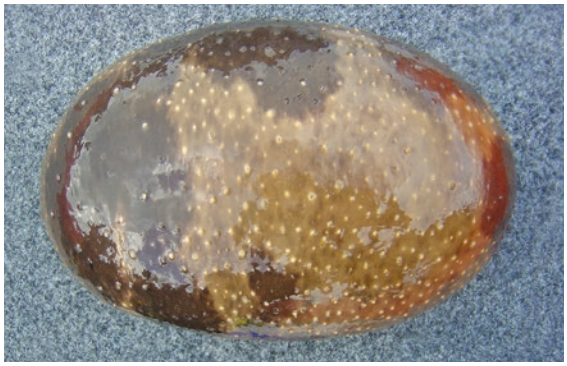
Anal teeth of *A. lecanora,* Type 3

Species it can be confused with

Golden sandfish

Variable black to beige, with or without black blotches. Grey or cream ventral surface. Stout body, highly arched dorsally. No body wrinkles. Anus terminal. Short black papillae, but longer than *H. scabra*. Commonly to 320 mm. Max 460 mm.

***A. lecanora,* Type 3, Bet Reef, Torres Strait (CSIRO)**



***A. lecanora,* Type 2, Mabuiag Island, Torres Strait (CSIRO)**

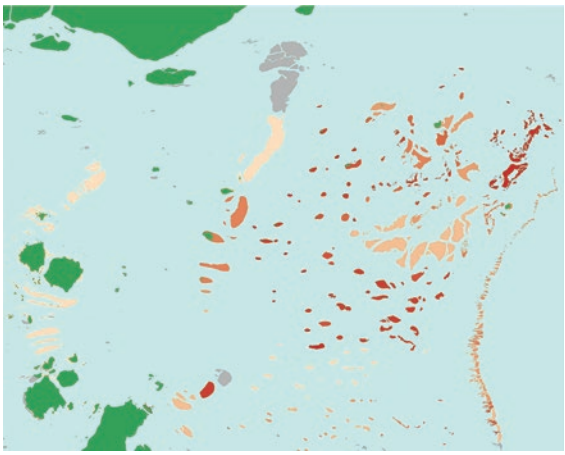
Leopardfish

Bohadschia argus (Jaeger, 1833)

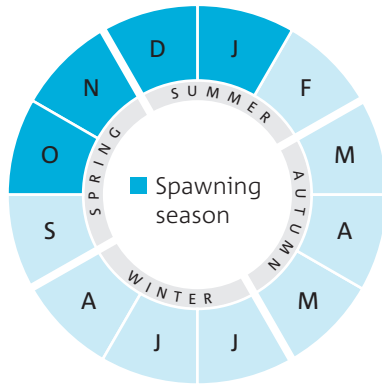
'Kepkep Aber'

Minimum size limit (gutted or alive)	300 mm
Description	Light grey, brown or mauve Characteristic eye-like spots with dark centre Cylindrical body, flattened ventrally Anus nearly dorsal Ejects tubules readily Commonly to 370 mm, max 600 mm
Size at maturity	300 mm
Where found	Commonly on sand at base of reef slopes or on reef flats and in lagoons
Depth	1–30 m, but mostly found in shallow waters
Indicative Value	Medium
Comments	Also known as tiger fish. Will readily breed (hybridise) with other *Bohadschia* species, particularly *B. vitiensis*

Distribution map from CSIRO surveys



Leopardfish (*B. argus*) species distribution in Torres Strait



***B. argus*, hybrid**

***B. argus*, Cumberland Passage, Torres Strait (CSIRO)**

Ejected tubules

Underside of *B. argus*

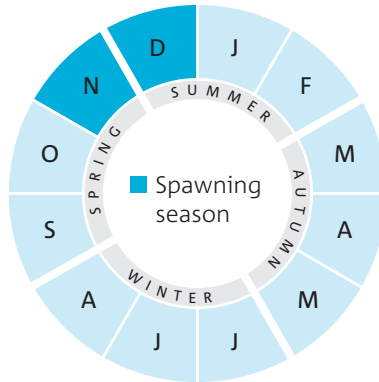
Brown sandfish

Bohadschia vitiensis (Semper, 1868)

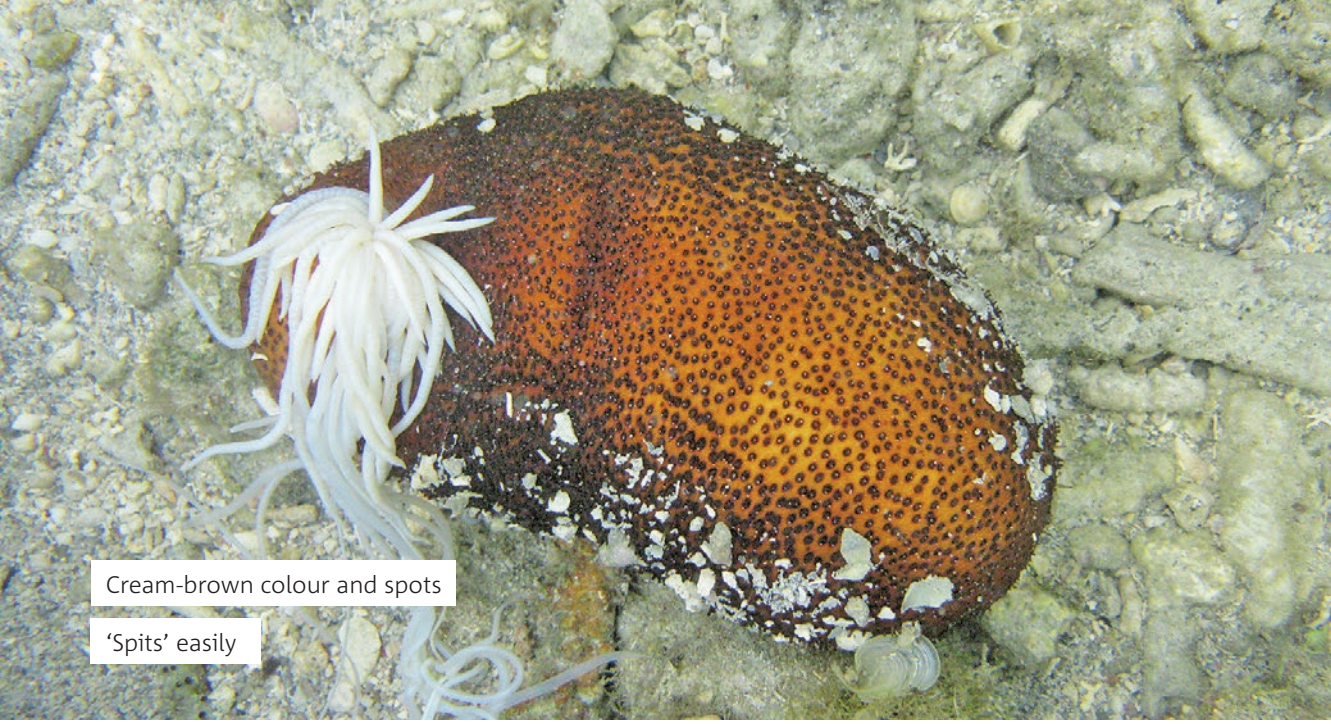
'Susus Aber'

Minimum size limit (gutted or alive)	250 mm
Description	Cream to yellow-orange, to brown, with numerous dark spots Highly arched dorsally, flattened ventrally Slippery body surface Mouth ventral with 20 short, yellowish tentacles Anus nearly dorsal without teeth Ejects tubules readily Commonly to 320 mm, max 400 mm
Size at maturity	150–260 mm
Where found	Calm waters of coastal lagoons and inner reef flats with soft sediments e.g. sand
Depth	1–7 m
Indicative Value	Medium
Comments	Subject to recent taxonomic review, previously known as B. marmorata

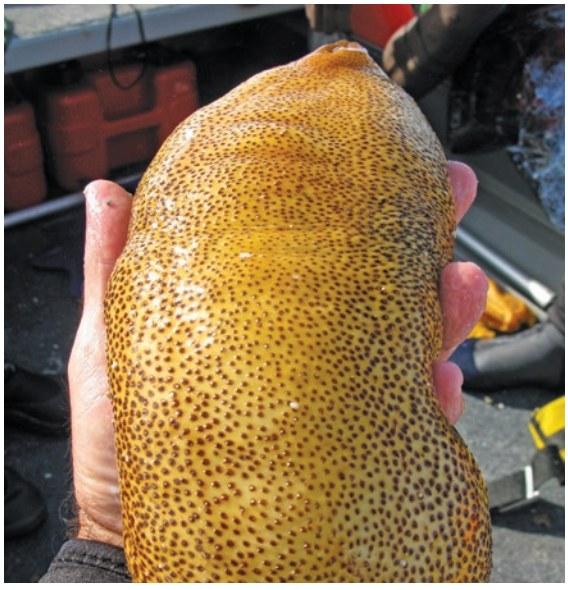
Distribution map from CSIRO surveys



Brown sandfish (*B. vitiensis*) species distribution in Torres Strait



***B. vitiensis*, Cumberland Passage, Torres Strait (CSIRO)**



Species it can be confused with

Sandfish

Brownish-grey, brownish-green or dark grey, with tiny black dots. Deep wrinkles on dorsal surface. Very short papillae. Anus terminal. Commonly to 240 mm. Max 320 mm. Found Warrior Reef and Dungeness Reef in Torres Strait.

Golden sandfish

Variable black to beige, with or without black blotches. Grey or cream ventral surface. Stout body, highly arched dorsally. No body wrinkles. Anus terminal. Short black papillae, but longer than *H. scabra*. Commonly to 320 mm. Max 460 mm.

Lollyfish

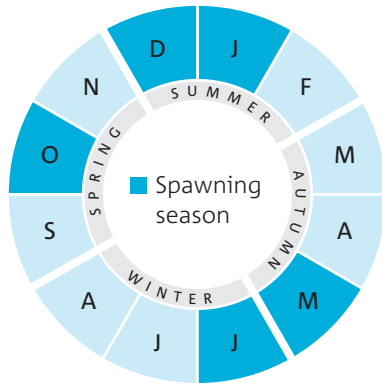
Holothuria atra (Jaeger, 1833)

'Wehwehsor Aber'

Minimum size limit (gutted or alive)	150 mm
Description	Black Thin cylindrical body Large specimens without sand covering body Small specimens usually covered in sand with bare spots Anus terminal to sub-dorsal Very short papillae Body surface produces reddish dye when rubbed Commonly to 230 mm, max 650 mm
Size at maturity	120–190 mm
Where found	Sand lagoons and reef flats
Depth	0–30 m
Indicative Value	Low
Comments	Most common species in Torres Strait Recent taxonomic review confirms that large and small morph is the same species (Uthicke *et al*. 2009)

Distribution map from CSIRO surveys

Lollyfish (*H. atra*) species distribution in Torres Strait



Red dye on hands when rubbed

H. atra, **(small morph), Murray Island, Torres Strait (CSIRO)**

Species it can be confused with

Blackfish

3 species. Dark brown to black. Contracts to a ball or lumpy shape when disturbed. Not widespread but dense populations where found.

H. atra, **(large morph), Murray Island, Torres Strait (CSIRO)**

Note red dye on *H. atra* body

White teatfish

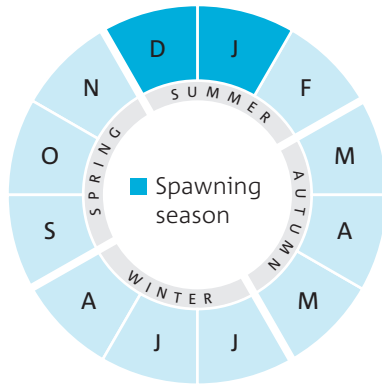
Holothuria fuscogilva (Cherbonnier, 1980)

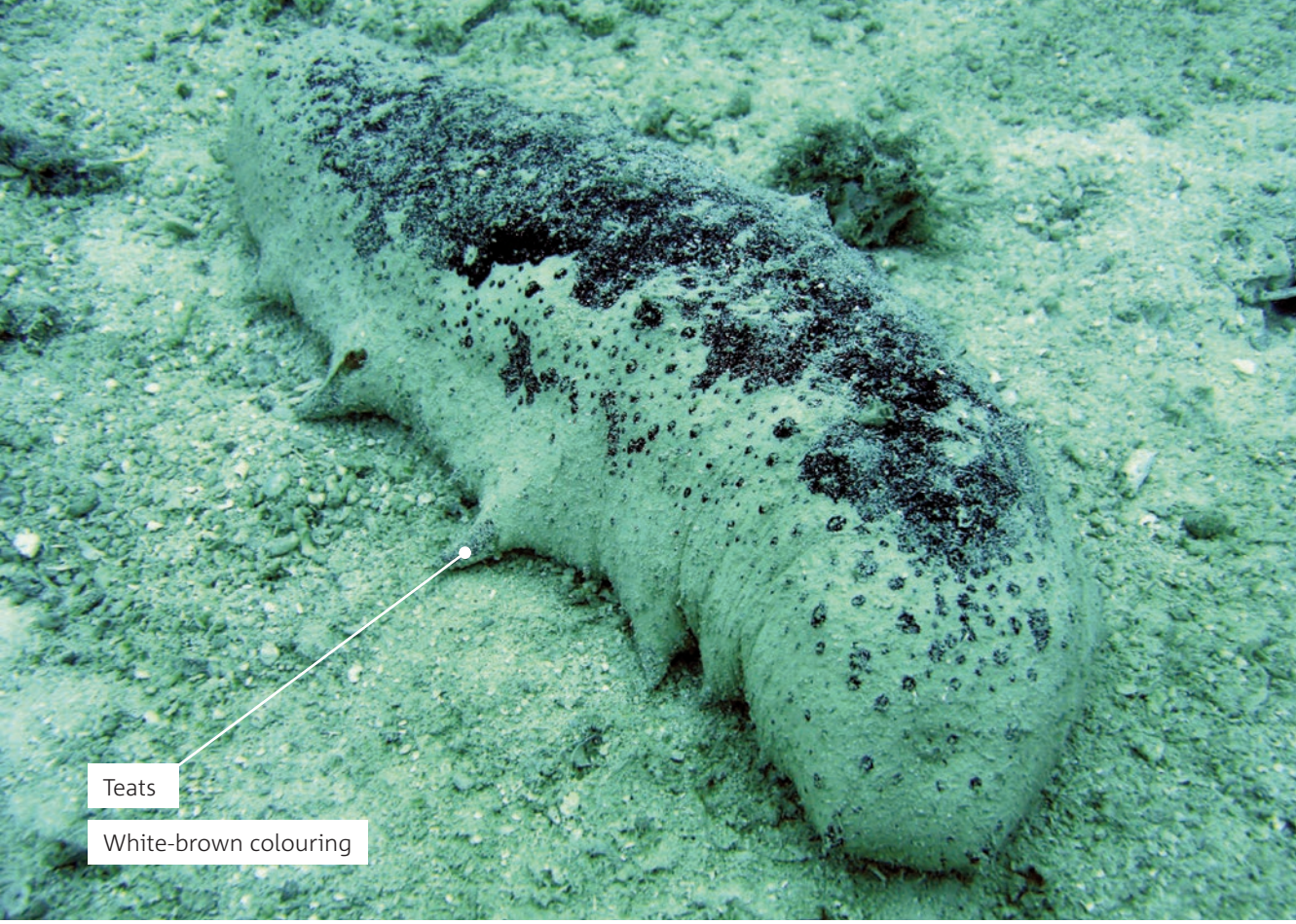
'Zarzer Pauraber'

Minimum size limit (gutted or alive)	320 mm
Description	Dark brown or creamy-white, with or without blotches Light brown ventral surface Dorsal surface usually coated with sand Stout body with pointed protrusions ('teats') along sides Rough texture Very short papillae Anus terminal with small teeth Commonly to 410 mm, max 550 mm
Size at maturity	320 mm
Where found	Lagoons and passes on pavement or sand Widespread but more common in north eastern Torres Strait
Depth	3–40 m
Indicative Value	High

Distribution map from CSIRO surveys

White teatfish (*H. fuscogilva*) species distribution in Torres Strait

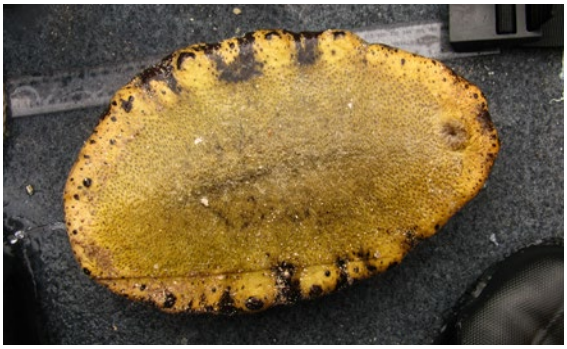




Species it can be confused with

Black teatfish

Always black, usually coated in sand with a dark grey belly. Stout body with pointed teats along sides. Rough texture. Commonly to 150 mm. Max 300 mm.



***H. fuscogilva* underside**

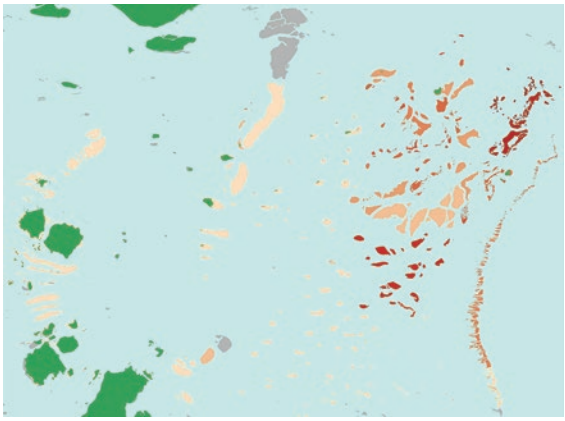
Elephant trunkfish

Holothuria fuscopunctata (Jaeger, 1833)

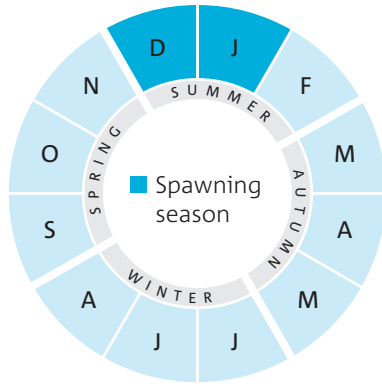
'Berber Aber'

Minimum size limit (gutted or alive)	240 mm
Description	Yellow to golden-orange dorsal surface with black spots Deep, brown transverse wrinkles White ventral surface Usually covered with sand Arched dorsally, flattened ventrally Short papillae Commonly to 480 mm, max 660 mm
Size at maturity	350 mm
Where found	Rubble sandy lagoons and reef flats
Depth	2–33 m
Indicative Value	Low
Comments	Common in Torres Strait

Distribution map from CSIRO surveys



Elephant trunkfish (*H. fuscopunctata*) species distribution in Torres Strait



Long

Deep wrinkles

***H. fuscopunctata,* Murray Island, Torres Strait (CSIRO)**

***H. fuscopunctata* underside**

Species it can be confused with

Sandfish

Brownish-grey, brownish-green or dark grey, with tiny black dots. Deep wrinkles on dorsal surface. Very short papillae. Anus terminal. Commonly to 240 mm. Max 320 mm. Found Warrior Reef and Dungeness Reef in Torres Strait.

Brown sandfish

Cream to yellow-orange, to brown, with numerous dark spots. Highly arched dorsally and flattened ventrally. Slippery body surface. Mouth ventral with 20 short, yellowish tentacles. Ejects tubules readily. Commonly to 320 mm. Max 400 mm.

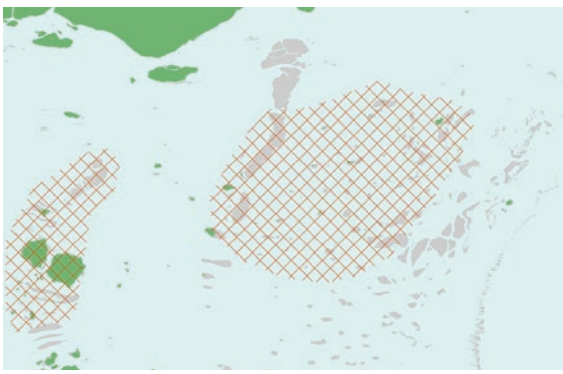
Golden sandfish

Holothuria lessoni (Massin et al. 2009)

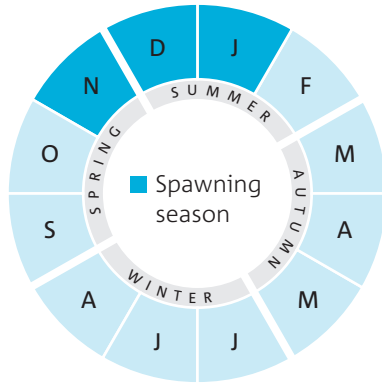
'Sirid Aber'

Minimum size limit (gutted or alive)	220 mm
Description	Variable black to beige, with or without black blotches Grey or cream ventral surface Stout body, highly arched dorsally, flattened ventrally No body wrinkles Anus terminal Short black papillae, but longer than those of the sandfish (H. scabra) Commonly to 320 mm, max 460 mm
Size at maturity	220 mm
Where found	Sandy reef flats and lagoons Very restricted distribution in western Torres Strait
Depth	1–8 m
Indicative Value	High
Comments	Newly described Formerly *H. scabra* var. *versicolor*

Distribution map from CSIRO surveys

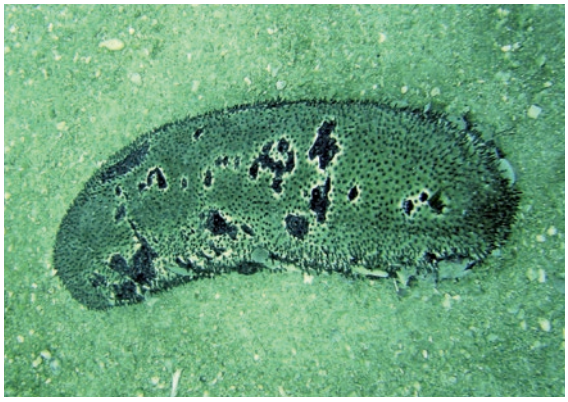


Golden sandfish (*H. lessoni*) species distribution in Torres Strait

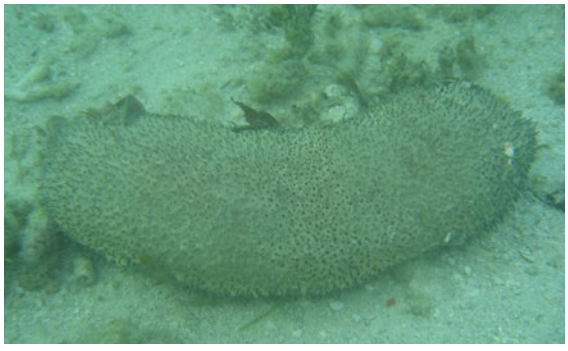


Can have blotches

No body wrinkles or stripes



H. lessoni, **Badu Island, Torres Strait (CSIRO)**



Species it can be confused with

Sandfish

Brownish-grey, brownish-green or dark grey, with tiny black dots. Deep wrinkles on dorsal surface. Very short papillae. Anus terminal. Commonly to 240 mm. Max 320 mm. Found Warrior Reef and Dungeness Reef in Torres Strait.

Brown sandfish

Cream to yellow-orange, to brown, with numerous dark spots. Highly arched dorsally and flattened ventrally. Slippery body surface. Mouth ventral with 20 short, yellowish tentacles. Ejects tubules readily. Commonly to 320 mm. Max 400 mm.

Sandfish

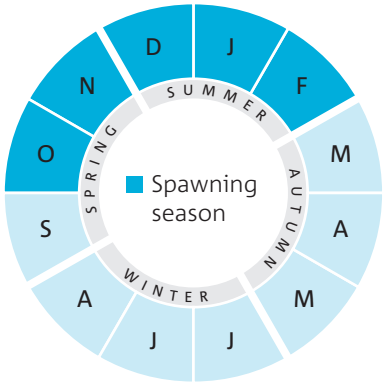
Holothuria scabra (Jaeger, 1833)

'Burbur Aber'

Minimum size limit (gutted or alive)	180 mm
Description	Brownish-grey, brownish-green or dark grey with tiny black dots Lighter coloured ventral surface Sub-cylindrical body with deep wrinkles on dorsal surface Anus terminal Very short papillae Commonly to 240 mm, max 320 mm
Size at maturity	200 mm
Where found	Muddy-sand seagrass beds and reef flats Warrior Reef, Dungeness Reef
Depth	0.5–20 m
Indicative Value	High
Comments	Sandfish were fished to depletion during 1990's in Torres Strait

Distribution map from CSIRO surveys

Sandfish (*H. scabra*) species distribution in Torres Strait



Deep wrinkles/stripes

Found on Warrior Reef

***H. scabra* juvenile and sub-adults, Warrior Reef, Torres Strait (CSIRO)**

***H. scabra*, Warrior Reef, Torres Strait (CSIRO)**

Species it can be confused with

Elephant trunkfish

Yellow to golden-orange dorsal surface, with black spots. Deep, brown transverse wrinkles. Usually covered with sand. White ventral surface. Arched dorsally, flattened ventrally. Commonly to 480 mm. Max 660 mm.

Brown sandfish

Cream to yellow-orange, to brown, with numerous dark spots. Highly arched dorsally and flattened ventrally. Slippery body surface. Mouth ventral with 20 short, yellowish tentacles. Ejects tubules readily. Commonly to 320 mm. Max 400 mm.

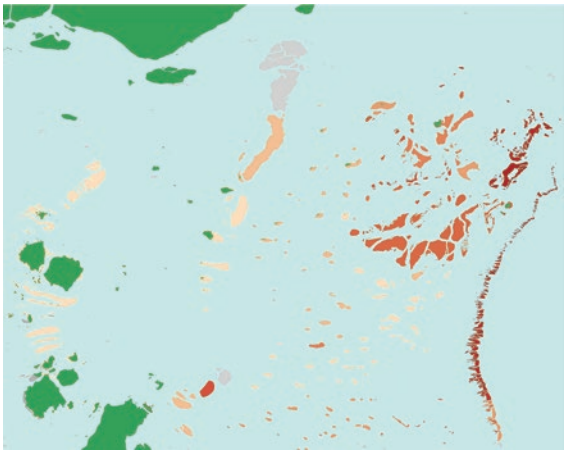
Black teatfish

Holothuria whitmaei (Bell, 1887)

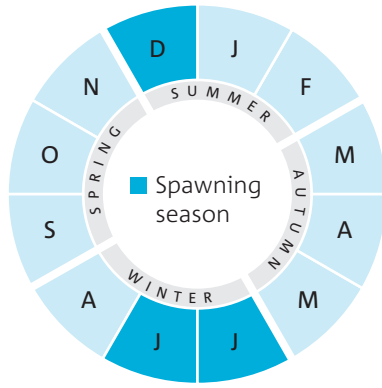
'Pauraber or Goleh-Goleh Pauraber'

Minimum size limit (gutted or alive)	250 mm
Description	Always black, usually coated in sand with a dark grey belly Stout body with pointed protrusions ('teats') along sides Rough texture Very short papillae Anus terminal with small teeth Commonly to 150 mm, max 300 mm
Size at maturity	220–260 mm
Where found	Most often found on reef flats, reef fronts and between reefs Widespread throughout east Torres Strait
Depth	1–20 m
Indicative Value	High
Comments	Black teatfish were heavily fished in the late 1990's in Torres Strait

Distribution map from CSIRO surveys



Black teatfish (*H. whitmaei*) species distribution in Torres Strait



***H. whitmaei*, Murray Island, Torres Strait (CSIRO)**

Species it can be confused with

White teatfish

Dark brown or creamywhite, often with blotches. Usually coated with sand. Stout body with pointed teats along sides. Rough texture. Commonly to 410 mm. Max 550 mm.

Blackfish

3 species. Dark brown to black. Contracts to a ball or lumpy shape when disturbed. Not widespread but dense populations where found.

Lollyfish

Black with thin cylindrical body. Usually covered with sand. Body surface produces reddish dye when rubbed. Most common species in Torres Strait.

Greenfish

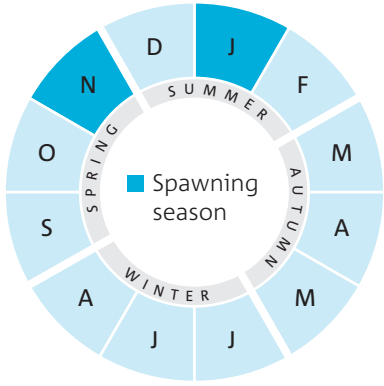
Stichopus chloronotus (Brandt, 1835)

'Kerir Aber'

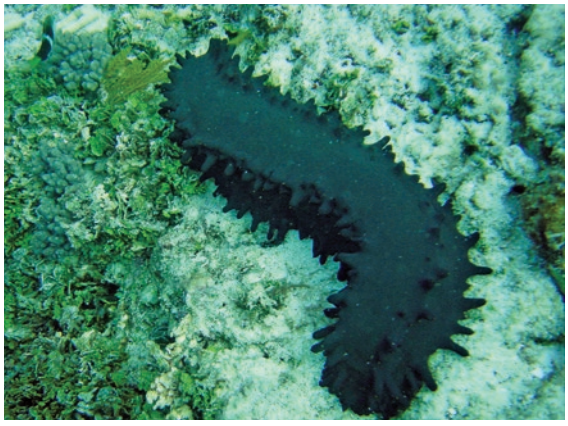
Minimum size limit (gutted or alive)	nil
Description	Dark green to near black Stout dorsal papillae in two rows, can have orange to yellow tips Rigid body with quadrangular section Anus terminal Commonly to 230 mm, max 380 mm
Size at maturity	140 mm
Where found	Reef flat and upper slopes Widespread throughout Torres Strait
Depth	1–27 m, but mostly found in shallow waters
Indicative Value	Medium
Comments	Difficult to process due to autotomy (falling apart)

Distribution map from CSIRO surveys

Greenfish (*S. chloronotus*) species distribution in Torres Strait



S. chloronotus, **Warrior Reef, Torres Strait (CSIRO)**



Species it can be confused with

Dragonfish

Stichopus horrens. Also known as Selenka's sea cucumber. Grey to light green-brown. Rigid body walll with quadrangular section. Covered with warts spaced irregularly. Anus terminal. Commonly to 320 mm. Max 390 mm.

Curryfish (common)

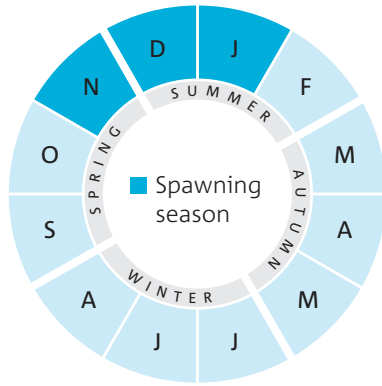
Stichopus herrmanni (Semper, 1868)

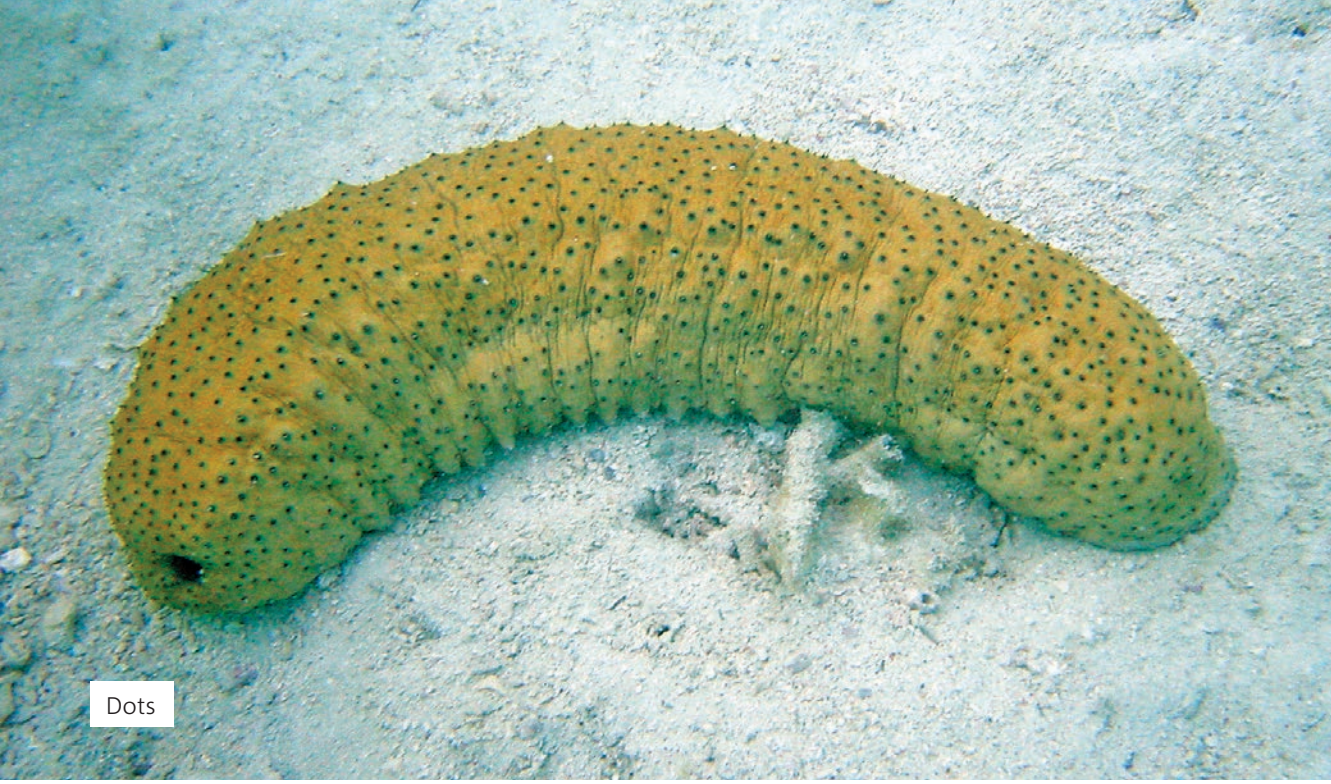
'Bambam Aber,' 'Yellow Curry'

Minimum size limit (gutted or alive)	310 mm
Description	Yellow-orange with numerous dark conical warts in rows of eight Firm body with quadrangular section Anus terminal Commonly to 390 mm, max 550 mm
Size at maturity	270–310 mm
Where found	Coastal reefs and lagoons in rubble and muddy-sand bottoms
Depth	1–30 m
Indicative Value	Medium
Comments	Most common of the curryfish species in Torres Strait

Distribution map from CSIRO surveys

Curryfish (common) (*S. herrmanni*) species distribution in Torres Strait





***S. herrmanni*, Murray Island, Torres Strait (CSIRO)**

***S. herrmanni* species can sometimes be a darker colour**

Species it can be confused with

Sandfish

Brownish-grey, brownish-green or dark grey, with tiny black dots. Deep wrinkles on dorsal surface. Very short papillae. Anus terminal. Commonly to 240 mm. Max 320 mm. Found Warrior Reef and Dungeness Reef in Torres Strait.

Curryfish (*vastus*)

Goldenish-yellow to brownish-yellow or reddish, olive green or greyish-green. Large wart-like papillae in 5-6 rows on upper dorsal surface. Smaller papillae over entire dorsal surface. Commonly to 330 mm.

Curryfish (*ocellatus*)

Green grey with yellow orange mottling, underside yellow. Dorsal surface rounded with four rows of large, white papillae in a zig zag pattern. Known as Eye-spot curryfish or Ocellated curryfish (pers. comm. Steve Purcell). Commonly to 300 mm.

Curryfish (vastus)

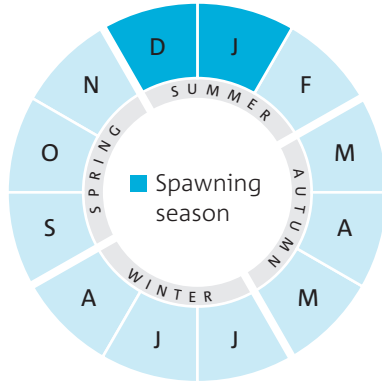
Stichopus vastus (Sluiter, 1887)

'Warwarr Aber,' 'Green Curry'

Minimum size limit (gutted or alive)	150 mm
Description	Green and yellow harlequin pattern Large wart like papillae in 5-6 rows on upper dorsal surface and lateral margins of ventral surface Fine, dark discontinuous lines surround base of papillae Smaller wart-like papillae over dorsal surface Deep transverse wrinkles may be present dorsally Mouth ventral with 18-20 tentacles, surrounded by collar of papillae Anus terminal without teeth Commonly to 350 mm
Size at maturity	Unknown
Where found	Inshore reefs edges on sand, coral rubble or muddy sand in shallow waters
Depth	1–8 m
Indicative Value	Medium
Comments	Also called Dinosaur curry in the Queensland East Coast Sea Cucumber Fishery Also known as Brown curryfish (pers. comm. Steve Purcell)

Distribution map from CSIRO surveys

Curryfish (*vastus*) (*S. vastus*) species distribution in Torres Strait



***S. vastus*, Bak Islet, Torres Strait (CSIRO)**

***S. vastus* can be a darker colour**

***S. vastus* underside**

Species it can be confused with

Sandfish

Brownish-grey, brownish-green or dark grey, with tiny black dots. Deep wrinkles on dorsal surface. Very short papillae. Anus terminal. Commonly to 240 mm. Max 320 mm. Found Warrior Reef and Dungeness Reef in Torres Strait.

Curryfish (common)

Yellow-orange with numerous conical warts in eight rows. Firm body, quadrangular section. Anus terminal. Commonly to 390 mm. Max 550 mm.

Curryfish (*ocellatus*)

Green grey with yellow orange mottling, underside yellow. Dorsal surface rounded with four rows of large, white papillae in a zig zag pattern. Known as Eye-spot curryfish or Ocellated curryfish (pers. comm. Steve Purcell). Commonly to 300 mm.

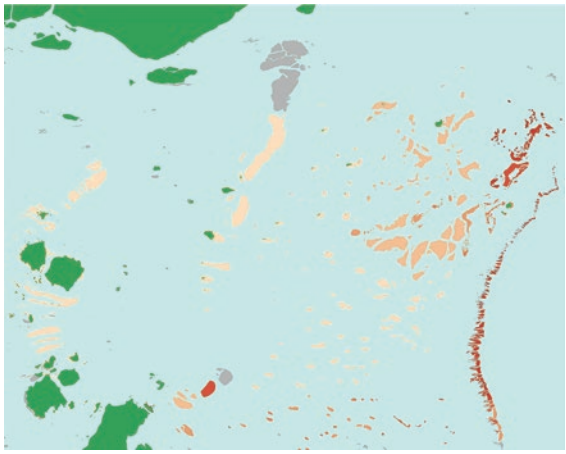
Prickly redfish

Thelenota ananas (Jaeger, 1833)

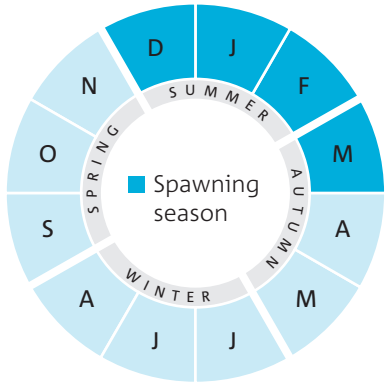
'Seker Aber'

Minimum size limit (gutted or alive)	350 mm
Description	Dark pink to brownish-red Large conical papillae over entire body which may be star shaped on a short stalk, or somewhat branched Arched dorsally, flattened ventrally Anus terminal Commonly to 550 mm, max 700 mm
Size at maturity	300–350 mm
Where found	Lagoons, in areas with rubble and passes
Depth	1–35 m
Indicative Value	Medium

Distribution map from CSIRO surveys



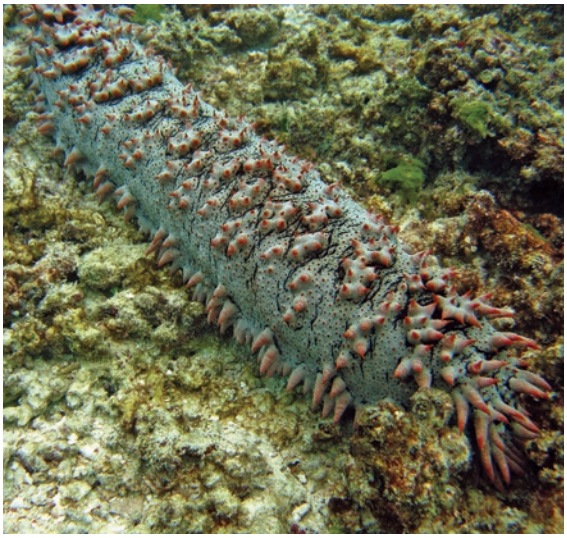
Prickly redfish (*T. ananas*) species distribution in Torres Strait



Odd shaped, lumpy papillae

Red to red-brown in colour

T. ananas **underside**



T. ananas, **Cumberland Passage, Torres Strait (CSIRO)**

Further information

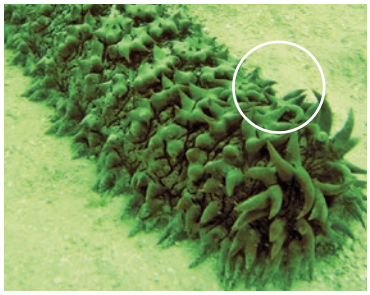
Glossary

Cuverian tubules

Anus nearly dorsal (towards top)

Podia (tube like feet, underside)

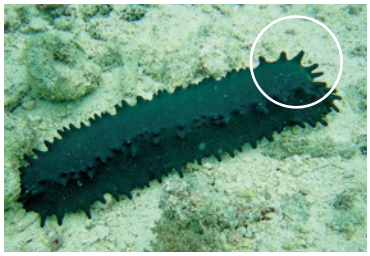
Papillae (conical)



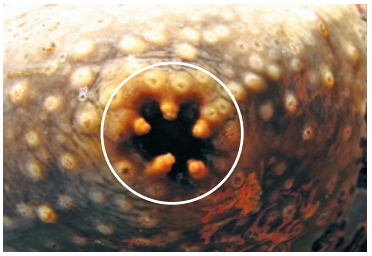
Anus terminal (towards belly)

Teats (pointed lateral protrusions)

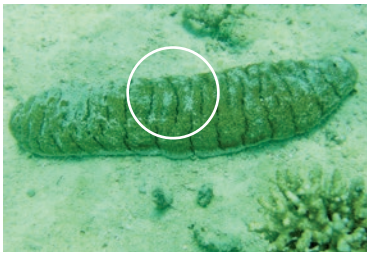
Papillae (stout)



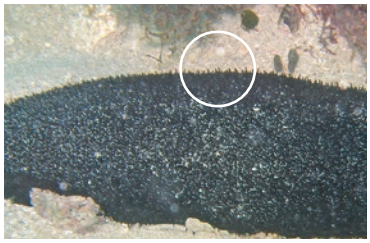
Anal teeth



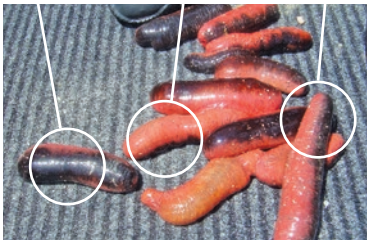
Deep wrinkles



Papillae (thin)



Dorsal (top) Ventral (underneath) Lateral (side)

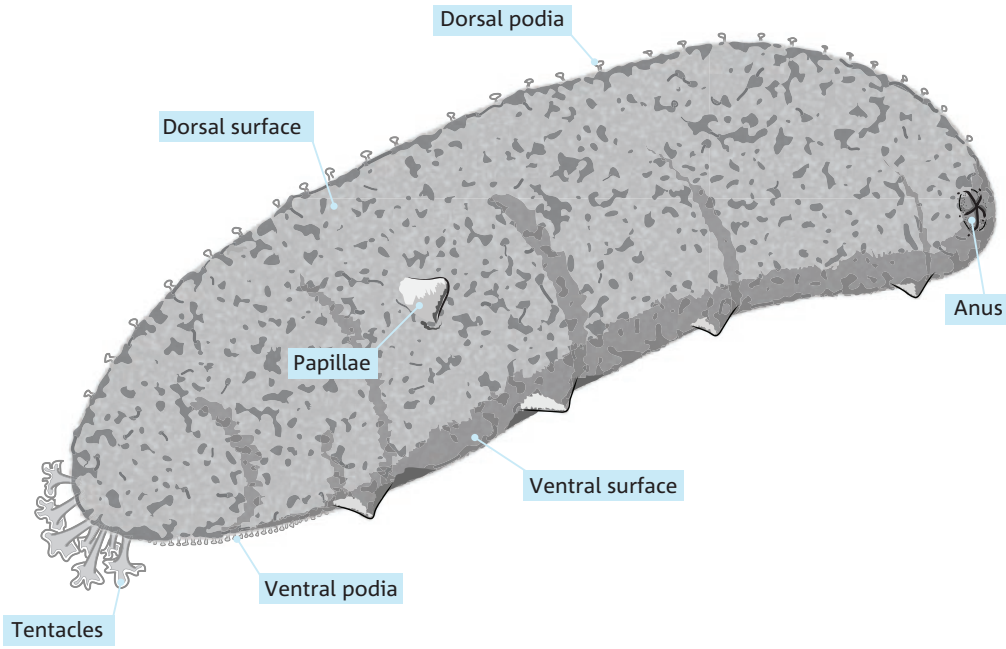


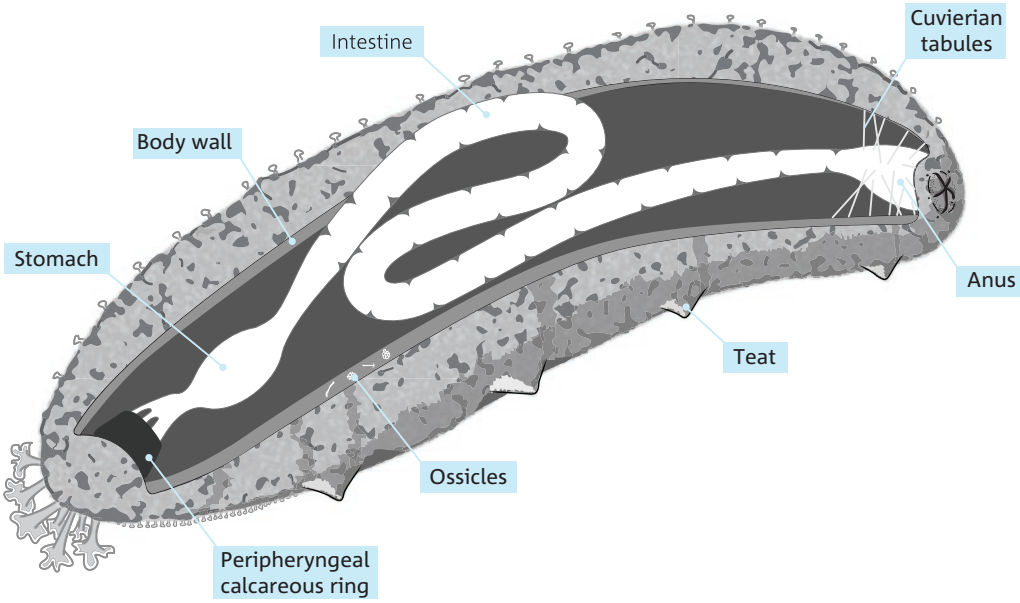
Tentacles

Taxonomy

Phylum **Echinodermata**
Class **Holothuroidea**
Order **Aspirodichirotida**

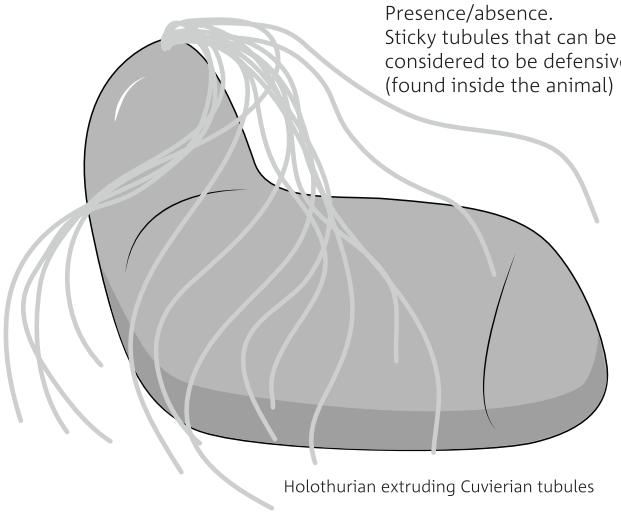
Commercial sea cucumber species in Torres Strait belong to Family Holothuriidae or Family Stichopodidae





Cuvierian tubules

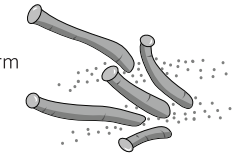
Presence/absence.
Sticky tubules that can be expelled, considered to be defensive (found inside the animal)



Holothurian extruding Cuvierian tubules

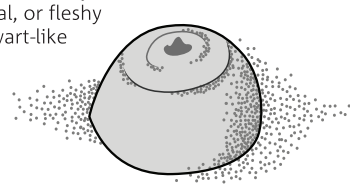
Podia

Typically form tube feet. Used for locomotion



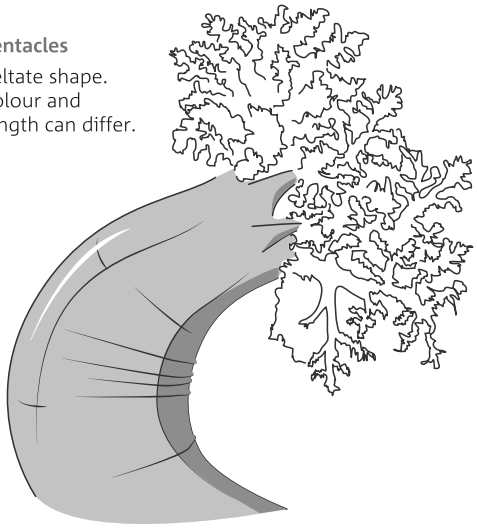
Papillae

Found on dorsal surface. Usually conical, or fleshy and wart-like



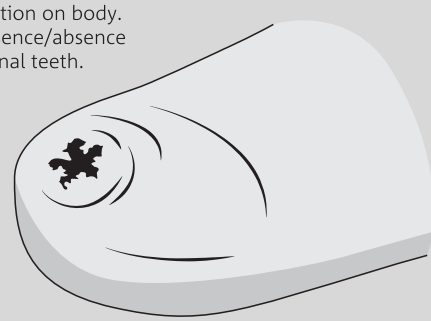
Tentacles

Peltate shape. Colour and length can differ.



Anus

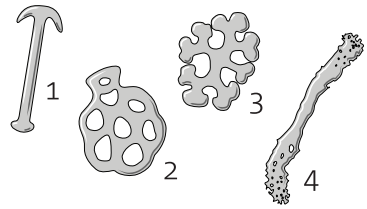
Position on body. Presence/absence of anal teeth.



White teatfish

Some sea cucumber species vary in individual colour and can be found at different depths.

For example species of Curryfish, Prickly Redfish and White Teatfish. Taxonomically these individuals are the same species based on their ossicles, which is like a fingerprint.



Ossicles

Ossicles are calcareous structures found in the body wall of sea cucumbers. They are used to distinguish between genus and species.

Each species has uniquely patterned shape and combination of ossicles and are like a finger print. Main ossicle shapes include rods (4), plate, buttons (2), tables, rosettes (3), anchors (1) and grains.

Post capture handling for sea cucumber species

These guidelines are not meant to be comprehensive or definitive. They only address the processing stages up to a point where the product will be ready for short term storage and transport for final processing into beche-de-mer. Other methods may be preferred by processors and/or buyers.

For all sea cucumbers, immediately after capture

- Remove any loose sand and coral pieces from the sea cucumber upon capture.
- Pass the sea cucumber to dory driver carefully – do not throw them into the dory as this will stress them and cause them to expel their intestines.
- If using a catch bag while diving, do not leave them in the bag too long as the mesh will damage the skin.
- All sea cucumbers should be stored in smooth containers with NO holes – if the container has holes the sea cucumber will squeeze into the hole which will cause damage.
- While being stored, the container should be regularly topped up with clean sea water (at least once every hour) until processing begins. A wet hessian bag placed over the sea cucumbers will prevent stress on hot days.
- Do not cut and gut sea cucumbers until they are ready to process (salted or par-boiled and frozen). However remove any expelled guts from the container as soon as possible.
- The pointed papillae covering Prickly redfish are easily damaged if the animal is not handled gently.
- Curryfish and Greenfish should be kept on ice if possible, or exchange water regularly as their flesh can disintegrate.

Cut and gut

- Cut sea cucumber with a sharp knife through the body wall as per Table 1. All cuts should be straight and along the centre line of the sea cucumber (either dorsal or ventral side). Only make cuts large enough to properly gut the sea cucumber.
- After cutting, expel the gut by gently squeezing the animal, or for Teatfish remove the gut by putting your hand inside.
- After gutting, further processing can be done by either salting, or par-boiling and freezing, depending on the infrastructure available and/or the processor preferences.

Salting

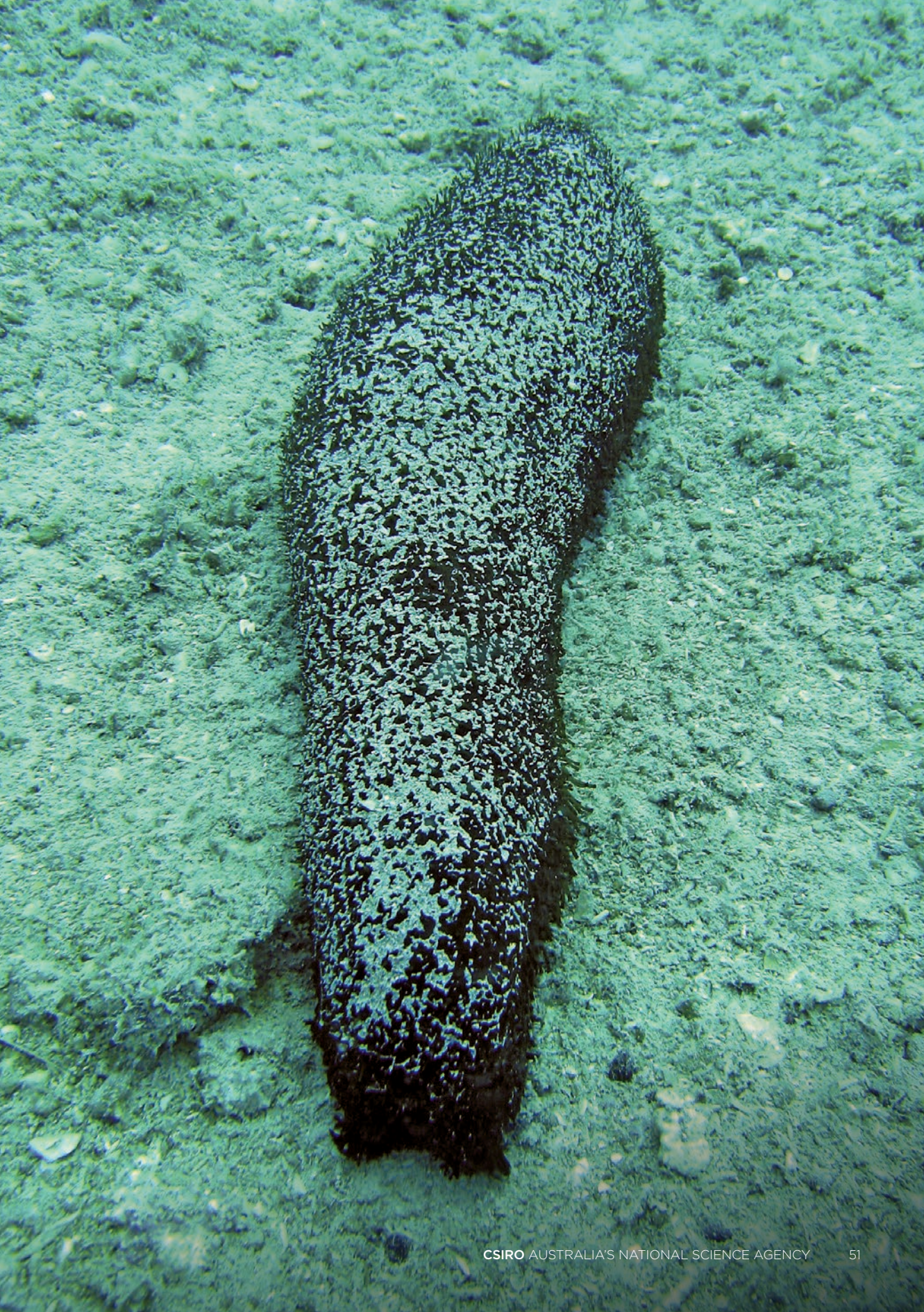
- Using a clean smooth container (without holes), sprinkle 20 mm of salt on the bottom of the container.
- Place gutted sea cucumbers in a single layer on the bottom of the container. Then add another 20 mm of salt on top before placing the next layer of sea cucumbers. Repeat this process until the container is full.
- For Teatfish, place a generous handful of salt inside the animal.
- Use a MINIMUM of 250 g salt per 1 kg of sea cucumber.
- The salt will cause liquid to be emitted from the sea cucumbers – this must be drained off regularly (at least daily).
- Store salted product in a chiller if possible, if not, store in the shade.
- Curryfish and Greenfish cannot be salted without first par-boiling.

Boiling and freezing

- Boil sea cumbers for 15–25 minutes (boiling vigorously) in sea water. Best to keep species separate during boiling if possible. If not possible, boil like species together.
- Pack on flat trays, single layer, and freeze.
- After freezing product can be packed into plastics bags for storage and transport.
- White Teat can be frozen green if no boiling facilities are available, but only at very low temperatures (<-18 degree C).
- Curryfish and Greenfish should not be put in vigorously boiling water.

Table 1. Note **dorsal** is top side of animal; **ventral** is bottom (belly) side

Species	Cut	Additional handling techniques
Sandfish *Holothuria scabra*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	
Golden sandfish *Holothuria lessoni*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	
White teatfish *Holothuria fuscogilva*	Make a cut along the centre of the dorsal (back) side in the middle third of the animal	
Black teatfish *Holothuria whitmaei*	Make a cut along the centre of the dorsal (back) side in the middle third of the animal	
Prickly redfish *Thelenota ananas*	Make a 50–80 mm cut along the centre of the ventral (belly) side in the middle of the animal	The pointed papillae covering Prickly redfish are easily damaged if the animal is not handled gently
Surf redfish *Actinopyga mauritiana*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	
Deepwater redfish *Actinopyga echinites*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	
Hairy blackfish *Actinopyga miliaris*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	
Burrowing blackfish *Actinopyga spin=-ea*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	
Deepwater blackfish *Actinopyga palauensis*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	
Stonefish *Actinopyga lecanora*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	
Leopardfish *Bohadschia argus*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	
Brown sandfish *Bohadschia vitiensis*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	
Greenfish *Stichopus chloronotus*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	Keep on ice if possible, or exchange water regularly as flesh can disintegrate Cannot be salted without first par-boiling Do not put in vigorously boiling water
Curryfish (common) *Stichopus herrmanni*	Make a 50 mm cut along the centre of the ventral (belly) side in the middle of the animal	Keep on ice if possible, or exchange water regularly as flesh can disintegrate Cannot be salted without first par-boiling Do not put in vigorously boiling water
Curryfish (vastus) *Stichopus vastus*	Make a 50 mm cut along the centre of the ventral (belly) side in the middle of the animal	Keep on ice if possible, or exchange water regularly as flesh can disintegrate Cannot be salted without first par-boiling Do not put in vigorously boiling water
Lollyfish *Holothuria atra*	Make a 20–30 mm cut along the centre of ventral (belly) side starting at the anus	
Elephant trunkfish *Holothuria fuscopunctata*	Make a 50–80 mm cut along the centre of the ventral (belly) side in the middle of the animal	



Conversion ratio tables

It is important that the relationship between measurement of sea cucumbers in different stages of processing, from live product to dried and ready for market be determined. This allows data from different processing states to be converted and used for tracking species TAC.

Salted: Assumed to be boiled and salted

'Wet weight gutted' used for monitoring BDM species TAC (highlighted numbers)

Deepwater redfish *(Actinopyga echinites)* 'Mamam Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.692	0.652	0.088
Gutted			0.964	0.152
Salted		1.382		0.309
Dry		6.579		

Surf Redfish *(Actinopyga mauritiana)* 'Teraber'

From \ To	Live	Gutted	Salted	Dry
Live		0.684	0.652	0.084
Gutted			0.873	0.187
Salted		1.145		0.286
Dry		5.347		

Hairy Blackfish *(Actinopyga miliaris)* 'Musmus Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.480	0.652	0.067
Gutted			0.964	0.209
Salted		1.037		0.217
Dry		4.785		

Deepwater blackfish *(Actinopyga palauensis)* 'Goleh-Goleh Aber

From \ To	Live	Gutted	Salted	Dry
Live		0.818	0.593	0.175
Gutted			0.728	0.190
Salted		1.374		0.262
Dry		5.263		

Burrowing blackfish *(Actinopyga spinea)* 'Aospir Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.544	0.375	0.073
Gutted			0.689	0.135
Salted		1.449		0.195
Dry		7.424		

Stonefish *(Actinopyga lecanora)* 'Parak Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.894	0.652	0.154
Gutted			0.729	0.158
Salted		1.372		0.253
Dry		6.329		

Leopardfish *(Bohadschia argus)* 'Kepkep Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.665	0.572	0.115
Gutted			0.777	0.171
Salted		1.286		0.233
Dry		5.841		

Brown sandfish *(Bohadschia vitiensis)* 'Susus Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.735	0.612	0.116
Gutted			0.834	0.157
Salted		1.199		0.189
Dry		6.337		

Lollyfish *(Holothuria atra)*
'Wehwehsor Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.436	0.236	0.063
Gutted			0.586	0.150
Salted		1.706		0.256
Dry		6.289		

White Teatfish *(Holothuria fuscogilva)*
'Zarzer Pauraber'

From \ To	Live	Gutted	Salted	Dry
Live		0.627	0.593	0.137
Gutted			0.775	0.237
Salted		1.290		0.309
Dry		4.219		

Elephant trunkfish
(Holothuria fuscopunctata) 'Berber Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.519	0.652	0.133
Gutted			0.911	0.242
Salted		1.097		0.263
Dry		4.132		

Golden sandfish *(Holothuria lessoni)*
'Sirid Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.645	0.526	0.098
Gutted			0.815	0.152
Salted		1.226		0.186
Dry		6.588		

Sandfish *(Holothuria scabra)*
'Burbur Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.496	0.355	0.049
Gutted			0.758	0.094
Salted		1.319		0.125
Dry		10.638		

Black teatfish *(Holothuria whitmaei)*
'Pauraber or Goleh-Goleh Pauraber'

From \ To	Live	Gutted	Salted	Dry
Live		0.677	0.529	0.108
Gutted			0.824	0.177
Salted		1.213		0.220
Dry		5.649		

Greenfish *(Stichopus chloronotus)*
'Kerir Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.894	0.652	0.175
Gutted			0.964	0.242
Salted		1.382		0.309
Dry		11.364		

Curryfish (common)
(Stichopus herrmanni) 'Bambam Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.651	0.652	0.036
Gutted			0.964	0.114
Salted		1.382		0.309
Dry		8.772		

Curryfish (vastus) *(Stichopus vastus)*
'Warwarr aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.894	0.652	0.175
Gutted			0.964	0.242
Salted		1.382		0.309
Dry		11.364		

Prickly Redfish *(Thelenota ananas)*
'Seker Aber'

From \ To	Live	Gutted	Salted	Dry
Live		0.677	0.481	0.055
Gutted			0.736	0.088
Salted		1.358		0.118
Dry		11.364		

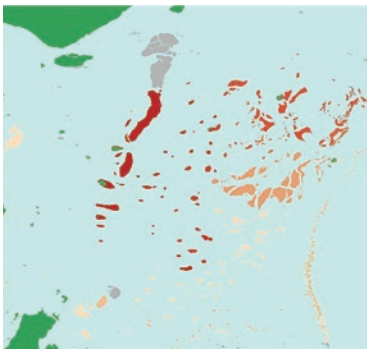
Differences between redfish

Deepwater redfish (Island name: Marnam Aber)

Actinopyga echinites (Jaeger, 1833)

Covered in sand

Rough surface

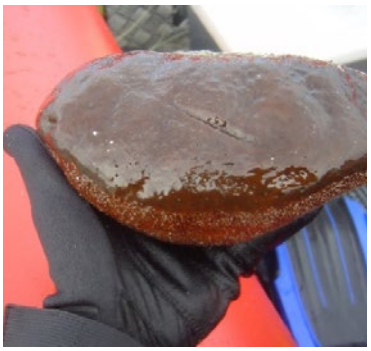


Found widely in Torres Strait

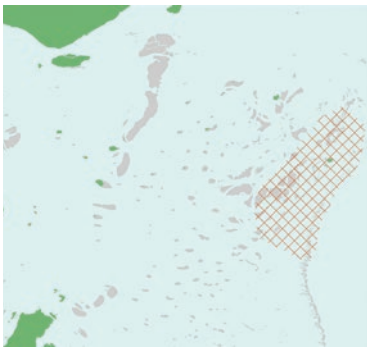
Surf redfish (Island name: Teraber)

Actinopyga mauritiana (Quoy & Gaimard, 1833)

White spots or lines around end



Smooth surface



Not common in Torres Strait

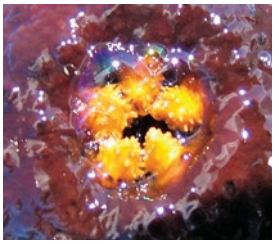
Differences between blackfish

Burrowing blackfish (Island name: Aospir Aber)

Actinopyga spinea (Cherbonnier, 1980)

Animal forms odd shape out of water

Long cylinder shape in water



Nodular teeth that are close together

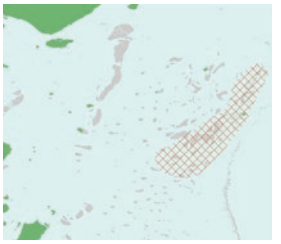
Deepwater blackfish (Island name: Goleh-Goleh Aber)

Actinopyga palauensis (Panning, 1944)

Protruding 'mouth' (proboscis) in water

Oval shape above water

Serrated teeth with spaces between

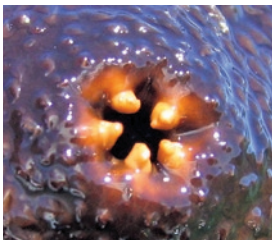


Hairy blackfish (Island name: Musmus Aber)

Actinopyga miliaris (Quoy and Gaimard, 1833)

Ball shape above water and 'hairy' looking

Slimy surface, often with globs of debris on top



Cone shaped (smoother) teeth with spaces between

Further information and references

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http://www.spc.int/coastfish/

FAO Fish Finder website
http://www.fao.org/fishery/fishfinder

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