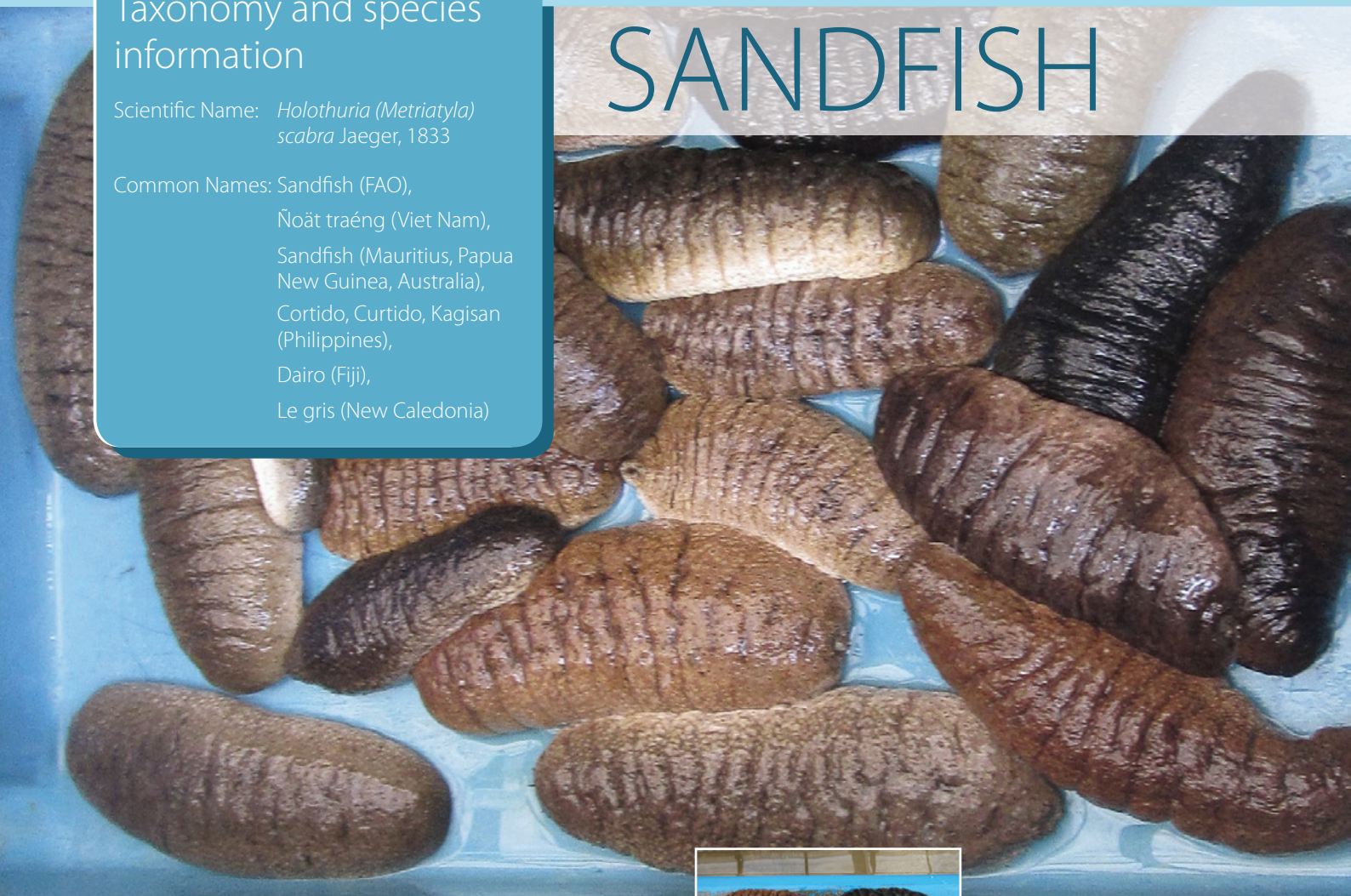


Taxonomy and species information

Scientific Name: *Holothuria (Metriatyla) scabra* Jaeger, 1833

Common Names: Sandfish (FAO),
Ñoät traéng (Viet Nam),
Sandfish (Mauritius, Papua
New Guinea, Australia),
Cortido, Curtido, Kagisan
(Philippines),
Dairo (Fiji),
Le gris (New Caledonia)

SANDFISH



Biological features

Sandfish are distributed widely in the tropical and subtropical areas of the Indo-Pacific region between latitudes 30°N and 30°S. It is a widespread Indo-Pacific species. It occurs in Asia, Australia and Africa in the Indian Ocean. Its range extends from the east coast of Africa and the Red Sea, eastward to the Caroline Islands and Tonga in the Pacific, and from the Amami Islands (southern Japan) southward to New Caledonia.

Its habitat is characterised by muddy sands in seagrass beds near mangroves, along the tidal flats of coastal waters.

The sandfish burrows in the soft sand and mud without attaching itself to hard substrates (e.g. coral rock or stone), unlike other sea cucumbers, such as the black teatfish (*H. whitmaei*) or the greenfish (*Stichopus chloronotus*).

Average body size, wet weight and body wall thickness are roughly 30 cm, 1 kg and 1 cm respectively.

Body colour could vary from black/dark brown to grey, showing dark-coloured wrinkles on the upper-side but paler colouring on the under-side.

Life cycle

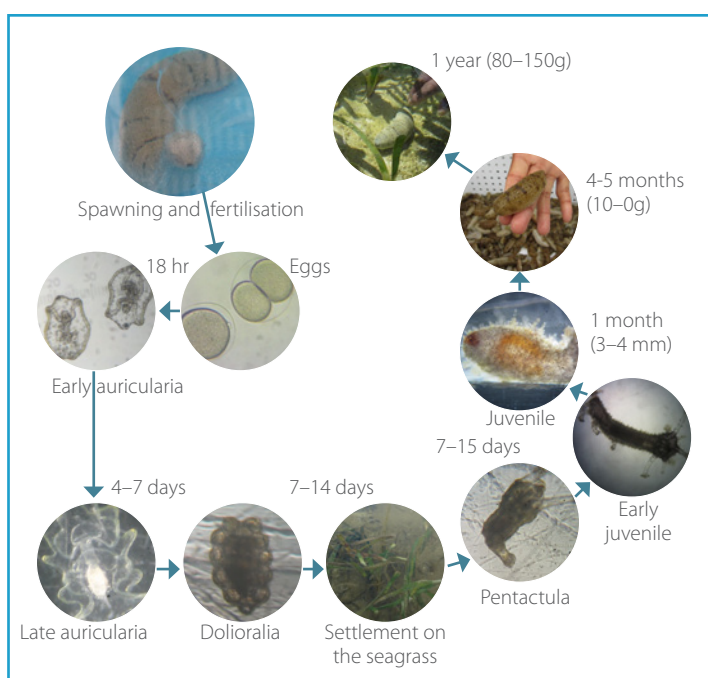
Sandfish larvae develop into juveniles in two weeks and can reach 3–4 mm in a month.

After 4–6 months they can weigh 10–20 g (3–5 cm long), and they reach around 80–150 g in a year.

Adults reach sexual maturity at a size of 150–250 g.

Sandfish adults spawn year-round in the tropics, while the spawning season takes place during the summer in temperate regions.

The fecundity of sandfish varies from 50,000 to 5 million eggs per female.



Developmental stage	Size (microns)	Timeframe (after fertilisation)
Fertilised egg (diameter)	150–160	
Gastrula	300–420	6–14 hrs
Early auricularia	430–570	18 hrs–day 4
Mid auricularia	650–800	day 3–day 8
Late auricularia	800–1200	day 5–day 13
Doliolaria	440–670	day 7–day 14
Pentactula	420–1000	day 9–day 15
Juvenile 1-month-old	3000–4000	

Production cycle

Hatchery operation consists of collecting and selecting broodstock, culturing microalgae for feeding auricularia larvae and growing epiphytes (natural microalgae) for feeding pentactula and juvenile stages.

The period from egg fertilisation to settlement takes around 8–14 days.

Settled animals are further reared for one to two months on settlement substrates; this period is known as ‘the first nursery culture’.

When juveniles reach 5–20 mm (around 0.3–1.0 g), they are moved to hapas (bag nets) or raceway tanks for grow-out, in a period known as ‘the second nursery culture’.

Juveniles at around 50 mm (10–20 g) can be transferred to grow-out ponds or sea pens. After two years of grow-out (although some can be harvested earlier), animals can reach 400–800 g and are harvested and processed (boiled, gutted, skinned, smoked/dried/frozen) for export.

Final survival to adult size is normally higher in ponds than in sea pens, varying from 50% to 85%.

Culture methods

Spawning techniques are based on the application of stressing actions, such as dry treatments and thermal shocks which are combined with artificial dried algae baths when necessary.

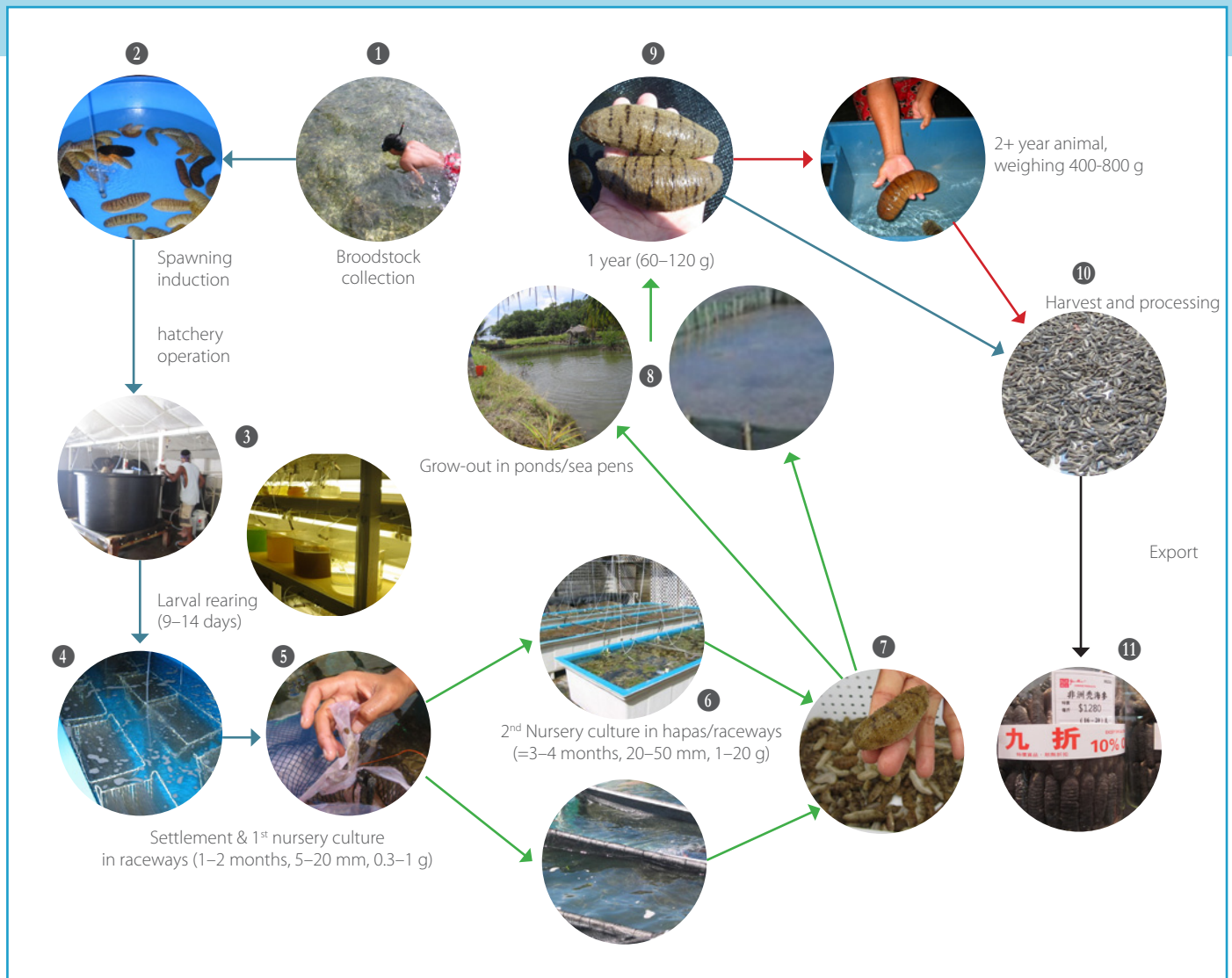
Auricularia larvae are fed on microalgae (mainly diatoms) for about two weeks, after which they settle and metamorphose into pentactula and juvenile stages.

Juveniles are cultured in raceways or tanks for about two months, after which they are transferred to larger ponds or ocean enclosures before being harvested for processing.

They may also be released into suitable habitats for ranching or restocking.

Attributes for aquaculture and stock enhancement

- » High value of processed final product
- » High (and increasing) demand
- » Wide distribution in shallow tropical and subtropical waters
- » Inhabits intertidal and tidal flat areas
- » Relatively sedentary
- » Easy to grow, harvest, process and store
- » Low food chain feeders (e.g. organic matter)
- » Low technology is needed for hatchery and grow-out



Harvesting and processing

Most sandfish either captured or cultured are harvested and processed into bêche-de-mer.

They are mostly exported to Asian countries (e.g., China, Japan, Taiwan, etc).

In certain Pacific countries, such as Fiji, sandfish is also consumed locally.

Bêche-de-mer processing involves:

- » removing guts/viscera;
- » boiling in sea water for 15–45 minutes;
- » rubbing the skin to remove hard spicules: the traditional method is by burying the cooked sandfish in sand for 12–18 hours and then rubbing the skin until all the spicules come off;
- » second boiling for 40–45 minutes; and
- » drying in the sun from 4 days to 4 weeks, depending on the size and weather conditions.

The 'dry factor' (dry weight vs. wet weight) of the processed sandfish is about 5–6%.

Marketing

The dried form accounts for 95% of all the sea cucumber species traded annually in mainland China, Hong Kong, Singapore, Taiwan, Malaysia, Korea and Japan.

The biggest re-exporters are mainland China, Hong Kong and Singapore.

Most of the sandfish product is traded and sold in a dried form in the Asian market, mainly in Hong Kong, where the products are distributed into mainland China.

Currently, retail prices in Hong Kong are from around USD 50 per kg for low-quality, small-sized products to USD 300 per kg for high-quality, larger products. The highest quality sandfish fetches between USD 500 and USD 800 per kg.

Sea cucumber suppliers and buyers form complicated webs of selling and reselling in Hong Kong and mainland China (e.g. from larger importers and distributors to smaller wholesalers and retailers in Hong Kong, to wholesalers and distributors and retailers in mainland China).

Current production status

Hatchery production of sandfish juveniles is conducted at experimental and commercial levels in Australia, Fiji, India, Indonesia, Federated States of Micronesia, Madagascar, Maldives, New Caledonia, Papua New Guinea, Philippines and Vietnam.

Comparative advantages of sandfish hatchery production in the Pacific region

- » The depletion of wild stocks has increased awareness on sustainable resource management, supported by local communities.
- » Aquaculture is a promising and feasible option for restoration of depleted stocks and restocking.
- » Aquaculture is a promising option for commercial production, for exports and domestic consumption in certain Pacific countries.
- » Involvement of coastal communities in grow-out activities is relatively simple.
- » Hatchery production of sandfish does not require large capital, high technology or changes in traditional practices.
- » Hatchery requirements for sandfish are similar to those for other species already being cultured within the region (e.g. giant clams).

Main disadvantages of hatchery production in the Pacific region

- » Small island states can afford only one centralised hatchery, unless low-technology, low-cost and low-maintenance hatchery strategies are developed.
- » Genetic differences between wild stocks should be taken into consideration when designing and implementing restocking and stock enhancement programmes.
- » Effective enforcement is needed when regulating harvesting wild stocks for broodstock by local communities and governments.
- » Coherent release strategies have yet to be established for cost-effective farming and resource enhancement.

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