



Abstracts & publications beche-de-mer

Advances in sea cucumber aquaculture and management

Alessandro Lovatelli, Chantal Conand, Steve Purcell, Sven Uthicke, Jean-François Hamel and Annie Mercier (eds).

Source: FAO Fisheries Technical Paper. No. 463. Rome, FAO. 2004. 457p.

This FAO Technical Fisheries Paper collates all the technical papers presented at the international workshop on “Advances in Sea Cucumber Aquaculture and Management” (ASCAM) held from 14 to 18 October 2003 in Dalian (Liaoning Province), People’s Republic of China, and organized by the FAO Fisheries Department. The publication is divided in four sections. The first part includes the introduction and recommendations made by the participants on issues concerning sea cucumber resource management and aquaculture. The next three sections contain the technical papers presented and discussed at the three sessions, namely (i) on the status of resources and utilization (Session I), (ii) on resource management (Session II), and (iii) on aquaculture advances (Session III).

Up-to-date information on the present status of world sea cucumber resources and utilisation is presented with special focus on those countries such as the People’s Republic of China, Ecuador, Indonesia, Japan, Malaysia and the Philippines, which have been heavily engaged in the industry for decades. Information from other countries such as Cuba, Egypt, Madagascar and Tanzania, relative new comers to the sector, is also provided indicating to some extent the growing interest with regards to the exploitation of holothurians for the demanding Asian markets.

The session on resource management focuses on the experiences of countries, highlighting progress made as well as identifying the constraints and knowledge gaps that need to be addresses to ensure adequate management of these multi species fisheries. Issues raised include whether restocking and stock enhancement should be used to manage sea cucumber fisheries.

Information on technical advances made in the artificial reproduction and farming of selected commercial species, particularly for the Japanese sea cucumber, *Apostichopus japonicus*, is presented. Furthermore, the workshop in Dalian provided the opportunity to share findings from ongoing research activities on a variety of other sea cucumber species including the Galapagos sea cucumber, *Isostichopus fuscus*. The interest in holothurian aquaculture is growing. This is evident from the number of countries that are engaged in sea cucumber aquaculture research, possibly as a result of declining natural resources or national aquaculture species diversification programmes.

The workshop recommendations were formulated and agreed during discussion sessions and are designed to help international and regional development organizations and national governments prioritize their activities concerning sea cucumber conservation and exploitation.

To receive a copy of the proceedings of the “Advances in Sea Cucumber Aquaculture and Management” (ASCAM) workshop in China, please contact: Alessandro.Lovatelli@fao.org

Preservation of genetic diversity in restocking of the sea cucumber *Holothuria scabra* investigated by allozyme electrophoresis

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Source: Canadian Journal of Fisheries and Aquatic Sciences 61:519–528.

Population genetics analyses should be considered when releasing hatchery-produced juveniles of *Holothuria scabra* when spawners from non-local populations are used. In New Caledonia, within-region genetic heterogeneity of *H. scabra* populations, examined through allozyme electrophoresis of 258 animals, indicated high gene flow between nine sites and FST values did not deviate significantly from zero. However, exact tests indicated that populations at two sites with limited water exchange in the southern

location were significantly different from populations at three other locations on the west coast. Inclusion of *H. scabra* sampled in Bali (n = 90) and Knocker Bay, Australia (n = 47), and comparisons with existing data from the west Pacific (Torres Strait, Solomon Islands, Upstart Bay, Hervey Bay) showed that populations were significantly different (using exact tests), and samples partitioned distinctly using UPGMA (Unweighted Pair Group Method with Arithmetic mean) clustering. Rogers' genetic distance values between populations were significantly related to geographic distances, showing a pattern of isolation-by-distance. The rapid increase in genetic distance over the first few hundred kilometres supports the view that the spatial extent of any translocation needs to be carefully considered on the basis of knowledge of variation in allele frequencies within the target area.

The genus *Labidodemas* (Holothuroidea:Aspidochirotida) revisited, with description of three new species and with re-positioning of *Holothuria* (*Ireothuria*) *maccullochi* Deichmann, 1958

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Source: Journal of Natural History 38:1811–1847.

Prior to the present revision the taxon *Labidodemas* comprised *Labidodemas americanum*, *L. pertinax*, *L. rugosum* and *L. semperianum*. An up-to-date reevaluation of the group proved that at least four additional species need to be assigned to it. Three of these are new to science: one has recently been discovered in the shallow waters of KwaZulu-Natal, Republic of South Africa; one originates from Low Island, Australia, and was erroneously identified as *L. semperianum*, and one stems from South-West Sulawesi, again erroneously identified as *L. semperianum*. In addition, *Holothuria maccullochi*, classified in the monotypic subgenus *Ireothuria*, and *Holothuria proceraspina* are assigned to *Labidodemas*; the former as a valid species and the latter as a synonym of *L. semperianum*. Annotated taxonomic descriptions, distribution maps and an identification key are given. The new observation that *L. americanum* possesses Cuvierian tubules suggests that its rank remains at generic level rather than at family level as was recently proposed.

Development of three commercial sea cucumbers, *Holothuria scabra*, *H. fuscogilva* and *Actinopyga mauritiana*: larval structure and growth

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Source: Marine and Freshwater Research 54:657–667.

Development of the tropical sea cucumbers *Holothuria scabra*, *H. fuscogilva* and *Actinopyga mauritiana* was investigated. *Holothuria scabra* developed through the feeding auricularia, the non-feeding doliolaria and the pentactula larval stages in 14–17 days at 26–28°C. *Holothuria fuscogilva* and *A. mauritiana* were reared to the auricularia and doliolaria stages respectively. The auricularia stage was reached by 40–70 h and the larvae developed lateral processes and a prominent ciliated band. Transformation to the doliolaria stage took 10–12 h and occurred on Days 9–12 in *H. scabra* and Days 12–22 in *A. mauritiana*. During this transition the ciliated band fragmented into ciliary rings, the location of which coincided with the lateral processes in the auriculariae. In *H. scabra*, metamorphosis to pentactulae (13–15 days) was marked by development of five primary tentacles and a ventroposterior podium. This podium was used to attach to the substratum. Development of a second podium marked the development of juveniles (14–17 days). Hyaline spheres were conspicuous in late auriculariae of *H. scabra* and may be an indicator of larval competence. The disappeared in the doliolaria stage, which suggests that they may function as nutritive reserves to sustain *H. scabra* through the non-feeding perimetamorphic period. Absence of these spheres in *H. fuscogilva*, and their poor growth in *A. mauritiana*, suggests the feeding protocol used may not be sufficient to support complete development in these species. Determination of food and culture conditions that promote hyaline sphere formation and control bacteria may be essential for successful culture of *H. fuscogilva* and *A. mauritiana*.

An adaptive rotational harvest strategy for data-poor fisheries on sedentary species: application to the giant red sea cucumber (*Parastichopus californicus*) in British Columbia

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Source: Simon Fraser University website: <http://www.rem.sfu.ca/fishgrp/research.html>

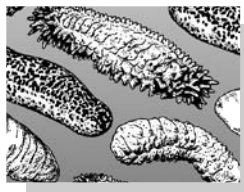
New hope for sea cucumber fisheries - research may help depleted stocks

Steve Purcell

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Source: PACIFIC ISLANDS.CC, the Website of Pacific Magazine and Islands Business, March 2004.

<http://www.pacificislands.cc/pm22004/pmdefault.php?urlarticleid=0032>



Correspondence
beche-de-mer

A call for information from Panama

I am from Panama (Central America), and am researching the possibility of growing sea cucumbers in ponds. I came across your webpage on sea cucumbers on the Internet. I would appreciate immensely, therefore, if you could provide me with any information you may have regarding farming sea cucumber. Having the Pacific and the Atlantic only fifty miles apart, I am certain the sea cucumber could be exploited in Panama, but our seas are so intensely exploited as it is that I would rather contemplate the option of farming it.

Juan Mendez S. (mendezj@sinfo.net)

Reply from C. Conand:

Farming is a difficult task; look at SPC *Beche-de-Mer Bulletin* #19 (2004) and the FAO report when it is available. Preliminary knowledge on the species' taxonomy, distribution and biology is a prerequisite. This is an important task!

Request for information from Dr Kim Friedman, SPC

The PROCFish project, under the auspices SPC's Reef Observatory is collating electronic and paper copies of "grey" literature and regional studies while comparing the status of inshore marine resources in 11 countries of the Pacific. During this five-year EU-funded study, the invertebrate scientist Dr Kim Friedman is collecting sea cucumber survey reports and theses, as well as information on fishing, processing and beche-de-mer prices.

This search will hopefully result in a library of useful information. Articles presently being sought or worked on are Colin Shelley's MSc thesis from PNG, and a translation (from French) of the ecology chapter of Chantal Conand's PhD thesis from New Caledonia. Readers are requested to send electronic or paper copies of any unusual but relevant sea cucumber literature to Kim Friedman at:

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