

# COMMUNICATIONS

## Workshop on sea cucumber identification at La Réunion

Pierrat J., Dedeken M., Fari C., Frouin P., Mulochau T., Quod C., Sancelme T., Trentin F., Viramoutou B. and Conand C.

Recent discussions on biodiversity loss in the Anthropocene, and the influence of global warming, have stimulated an increased interest in biodiversity. Many expeditions and programmes have recently collected specimens of marine fauna, including holothurians, and taxonomy skills are required to identify them at different levels, down to species.

A working group gathered on 23 November 2019 at La Réunion University, with participants from different laboratories and non-governmental organisations.

Several species of sea cucumbers from the families Holothuriidae and Stichopodidae were collected to prepare the ossicles following the classical method (Samyn et al. 2006) and FAO books (Purcell et al. 2012) were distributed to participants to help them for further work.

### References

Purcell S., Samyn Y. and Conand C. 2012. Commercially important sea cucumbers of the world. FAO species catalogue for fishery purposes. No. 6. Rome: Food and Agriculture Organization of the United Nations. 150 p.

Samyn Y., VandenSpiegel D. and Massin C. 2006. Taxonomie des holothuries des Comores. ABC Taxa, 1. 130 p



Figure 1. Participants to the workshop at La Réunion University

## PhD thesis

### *Sea cucumbers of the Holothuroiida order from the Ain Franine region (west coast of Algeria): biology, ecology and exploitation*

Farah Slimane-Tamacha

Presented on 8 December 2019, Department of Marine Sciences and Aquaculture, Faculty of Natural Sciences and Life, University Abdelhamid Ibn Badis, Mostaganem, Algeria.<sup>1</sup>

#### Abstract

Our study focuses on the reproductive biology and population dynamics of sea cucumbers on the western Algerian coast. During the sampling period (October 2016 to September 2017) it was noted that only *Holothuria (R.) poli* (Delle Chiaje, 1823) and *Holothuria (P.) sanctori* (Delle Chiaje, 1823) are represented consistently. The other two species, *Holothuria (H.) tubulosa* (Gmelin, 1790) and *Holothuria (R.) arguinensis* (Koehler and Vaney, 1907), were much less abundant. It is for this reason that we focused especially in our study on the first two aforementioned species.

The study of reproduction considered only for *Holothuria (R.) poli* showed that sex ratio is in favour of females throughout the year. The survey of the monthly evolution of the two parameters (RGS and K) showed a single spawning period with a peak in July. The average size at first sexual maturity is 150 mm. Microscopic analyses of gonadal structures have shown that the sexual cycle of *Holothuria (R.) poli* is composed of five stages: stage I recovery; Stage II growth; stage III near-mature; stage IV mature; and stage V spawning.

The size structures established for the four studied holothurians species generally have a normal distribution. Total anaesthetised lengths range from: 100 to 290 mm for *Holothuria (R.) poli*; 140 to 325 mm for *Holothuria (P.) sanctori*; 100 to 360 mm for *Holothuria (H.) tubulosa*, and 95 to 290 mm for *Holothuria (R.) arguinensis*. The b parameter of the weight-size relation is less than 3 for the two holothuroids (*Holothuria (R.) poli* and *Holothuria (P.) sanctori*), reflecting a lower allometry which means that the size grows faster than the weight. The growth parameters ( $L_{\infty}$ ) of the Von Bertalanffy equation are similar for the two holothurids: *H. (R.) poli* (364.5mm) and *H. (P.) sanctori* (364.5mm). The growth coefficient (K) of these two species – 0.25 mm/year for *Holothuria (R.) poli* and K= 0.35/year for *Holothuria (P.) sanctori* – are closest.

The values of total mortality ( $Z = 0.83$ ), natural mortality ( $M = 0.27$ ) and fishing mortality ( $F = 0.56$ ) obtained for *H. (R.) poli* appear to match with individuals ranging between 100mm and 290 mm. The values obtained for *H. (P.) sanctori* ( $M = 0.32$ ,  $Z = 0.90$  and  $F = 0.58$ ) seem to match with individuals ranging between 140 mm and 325 mm. The recruitment model consists of a single peak in March for *Holothuria (R.) poli* and another peak in April for *Holothuria (P.) sanctori*.

Through the questionnaire carried out during this study we noted the existence of illegal fishing of sea cucumbers along the entire Algerian coast, which requires urgent regulation.

**Keywords:** *Holothuria (R.) poli*, *Holothuria (P.) sanctori*, reproduction, growth, exploitation, illegal fishing, Oran Bay

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<sup>1</sup> <http://lpvrmlsm.univ-mosta.dz/index.php/soutenance-de-these/soutenances-doctorat-systeme-classique/oulhiz-aicha>

## Publications related to holothurians, published in 2019

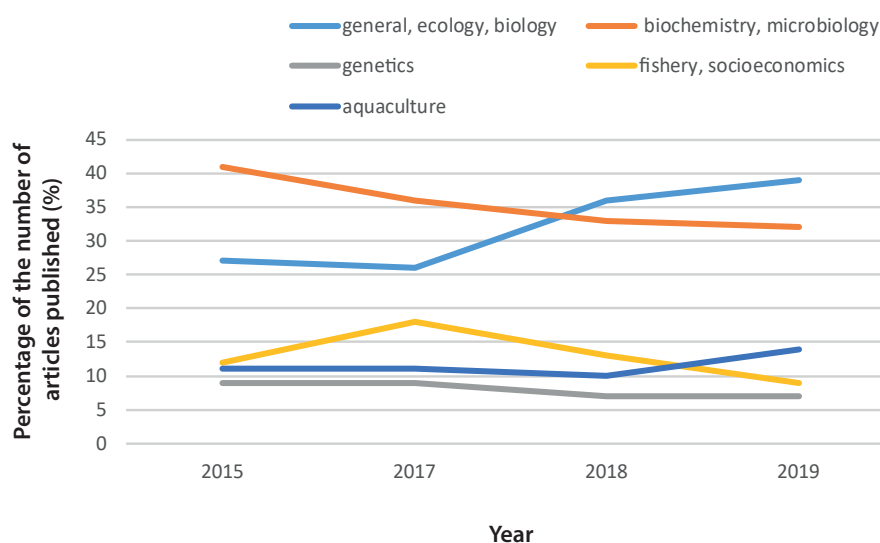
By Chantal Conand

A Google Alert, using the word “holothurian”, was set up for the period from January to December 2019. The same method had first been used in 2015 to produce the article “Bibliography on holothurians: Access to modern tools to follow new publications”, which was published in the SPC *Beche-de-mer Information Bulletin* #36, and yearly since then.

**Table 1.** Number of publications on sea cucumbers found in 2019 by month, using a Google Alert with the word “holothurian”.

Month	Category					Total/month
	General, ecology, biology	Biochemistry, microbiology	Genetics	Aquaculture	Fishery, socioeconomics	
January	10	7	1	1	3	22
February	12	5	2	1	4	24
March	8	6	2	0	1	17
April	11	10	2	1	5	29
May	6	6	2	2	1	17
June	6	4	1	0	6	17
July	8	6	2	3	3	22
August	9	11	1	5	3	29
September	4	8	1	1	2	16
October	13	13	1	4	6	37
November	22	12	1	5	1	41
December (partial)	9	7	4	3	6	29
Total	118	95	20	26	41	300
%	39,3%	31,7%	6,7%	8,7%	13,7%	100%

The steady decrease in articles devoted to holothurians (from over 400 in 2015 to 300 in 2019) prompts us to look at a longer period, and to verify, among other things, whether the decrease in articles on fisheries and socioeconomic issues (Fig. 1) is a consequence of the disappearance of these fisheries in several parts of the world due to overfishing.



**Figure 1.** Evolution of the yearly ratio of articles published from 2015 to 2019.

## Tribute to Professor Patrice Francour

*From the research team of the Protection and Valorization of Littoral Marine Resources and Molecular Systematic Laboratory, Department of Marine Science and Aquaculture, Faculty of Natural Sciences and Life, Abdelhamid Ibn Badis University, Mostaganem, Algeria.*

It is with immense sadness that we received the announcement of the premature loss of a seasoned scientist, Professor Patrice Francour, who was committed to the conservation of the marine environment in the Mediterranean. He passed away on Sunday, 13 October 2019 after a long fight against an incurable disease.

Doctor of Aix-Marseille University, Patrice Francour was appointed Senior Lecturer in Nice in 1998, then Professor in 2002. He directed the ECOMERS<sup>1</sup> laboratory for 10 years, before its transition to a Research Federation in 2016 and a Joint Research Unit in 2019.

He was thus one of the architects of the development of the ECOMERS laboratory, which has now become ECOSEAS<sup>2</sup> and is accredited by the CNRS<sup>3</sup>.

Patrice was passionate about marine biodiversity and coastal ichthyofauna, in particular. He developed many approaches – based on *in situ* observations – to better identify, understand and qualify the ecological state of coastal ecosystems, and to promote their preservation; for example, the FAST methodology and the monitoring of artificial reefs, a theme for which Patrice never hesitated to receive young researchers in order to introduce them to his method.

He was among the pioneers who studied holothurians (sea cucumbers) in the Mediterranean Sea ecologically and especially the standardisation of measures of *Holothuria* that many researchers were unaware of at the time. He reviewed predation on these species in 1997, and studied in detail the microdistribution of holothurians within the Mediterranean seagrass (*Posidonia oceanica*) ecosystem.

His erudition and scientific expertise, as well as his plethora of bibliographic backgrounds, have enabled many researchers to restructure their research and find solutions to more current problems. From the beginning, Patrice committed himself to the protection of the marine environment and to marine protected areas in the Mediterranean. With his academic commitment, Patrice extended his work to many organisations and associations, including the International Union for Conservation of Nature.

This scuba diving enthusiast will be missed by lovers of our dear Mediterranean, and it goes without saying that his memory will be honoured by our scientific contributions, a loyal return for his humility and his bonhomie.

Rest in peace Patrice.



Professor Patrice Francour.

<sup>1</sup> Écosystèmes Côtiers Marins et Réponses aux Stress (Marine Coastal Ecosystems and Stress Responses)

<sup>2</sup> Ecology and Conservation Science for Sustainable Seas

<sup>3</sup> Centre National de la Recherche Scientifique (National Center for Scientific Research)

## Sea cucumber trade in the Taiwan International Fisheries and Seafood Show

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The Taiwan International Fisheries Seafood Show (TIFSS) is held annually at the Kaoshiung Exhibition Center in Chinese Taipei, and is one of the most popular seafood-related events, attracting researchers, academics, farmers, vendors and buyers of seafood products from all over the world. TIFSS 2019, held from 26 to 28 September 2019, attracted 180 exhibitors from 16 countries and an estimated 7000 visitors. People attending the seafood tradeshow had the opportunity to network and update themselves on the latest technology available in the field of aquaculture and fisheries. Buyers were able to discover new products and cutting-edge equipment, while vendors were able to display their products and innovation.

TIFSS 2018 had new cosmetic and food products made from sea cucumber on display. Shinhan ECO Co. Ltd., a South Korean company (Fig. 1) with a branch in Qingdao, Shandong Province, China, promoted cosmetic (under the brand name *Chunsulbi*) and food products made from extracts of the red sea cucumber (*Stichopus japonicus*) found in Jeju Island, South Korea. These cosmetic products included moisturising creams, sheet masks, soaps, whitening creams, sun blocks and cleansing foam (Fig. 2). Food products included red sea cucumber gel, granules, and bottled beverages and capsules that were sold as health supplements (Fig. 3).



**Figure 1.** Shinhan Eco. Co. Ltd. booth in South Korea (at TIFSS 2018), promoting products made from extracts of the red sea cucumber (*Stichopus japonicus*).

**Figure 2.** Cosmetics produced by Shinhan Eco. Co. Ltd. and made from extracts of the red sea cucumber (*Stichopus japonicus*).

**Figure 3.** Health supplements produced by Shinhan Eco. Co. Ltd. and made from extracts of the red sea cucumber (*Stichopus japonicus*).

Vlazar Coasta Caribe, a company from Nicaragua (Fig. 4) promoted dried sea cucumbers. Species available included: Molongo black sea cucumber, also known as donkey dung sea cucumber (*Holothuria mexicana*), pikachu (scientific name unavailable), pepino lapiz (*Holothuria floridana*), pepino ballena (*Isochopus badiotus*) and toalla (scientific name unavailable). Figure 5 shows pictures of the different sea cucumber species promoted by the company.



**Figure 4.** The booth of the company Vlazar Costa Caribe from Nicaragua (at TIFSS 2019), promoting dried sea cucumbers.



**Figure 5.** Sea cucumber brochure distributed by the Nicaraguan company Vlazar Costa Caribe.

Top row, from L. to R.: Molongo (*Holothuria mexicana*); Molongo dried; Picachu (scientific name unknown) Middle row, from L. to R.: Picachu dried; Lariz (*Holothuria floridana*); Toalla (scientific name unavailable) Bottom row, L.: Café (*Isochopus badiotus*)

## Conferences and symposiums

List prepared by Chantal Conand

### Symposiums held in 2018

#### *International Echinoderms Conference (Nagoya, 2018)*

21 October 2019 communication from: Tatsuo Oji, Toshihiko Fujita, Tatsuo Motokawa, Miéko Komatsu, Yukio Agatsuma and Ken'ichi Kanazawa

We are happy to announce that the proceedings of the 16<sup>th</sup> International Echinoderms Conference held in Nagoya, Japan last year have been published online at: <https://mapress.com/j/zs/issue/view/zoosymposia.15.1>

All papers from the proceedings are open access. We thank the volunteer reviewers of the papers that were submitted to the proceedings.

### Symposiums held in 2019

#### *11<sup>th</sup> Western Indian Ocean Marine Science Association International Symposium – University of Mauritius, 1–6 July 2019*

The symposium has been an important event for marine science in the Indian Ocean. Around 600 scientists, managers and students were able to exchange information during the week on many topics and multi-disciplinary fields. Plenaries by well-known scientists, selected oral communications, numerous posters, mini-symposia and other activities have made it memorable. More information on the symposium is available from: [www.wiomsa.org](http://www.wiomsa.org)

Holothurians were the subject of:

Oral communications

- Kuehnhold H., N. Steinmann N., Huang Y., Meyer A. and Kunzmann A. Temperature-dependent aerobic scope and Hsp70 expression in the sea cucumber *Holothuria scabra*.
- Conand C., Claereboudt M., Dissayanake C., Fernando S., Fouad A., Govinden R., Hart A., Lavitra T., Leopold M., Mmbaga T., Mulochau T., Shea S., Vaitilingon D., Yahya S. and Friedman K. Fisheries and management of sea cucumbers in the Indian Ocean: An update.
- Léopold M., Govinden R., Caquelard J., Ebrahim A. and Bach P. Estimating sea cucumber resource abundance in Seychelles using fishery-dependent data.

Posters

- Di Simone M., Horellou A. and Conand C. Towards a CITES listing of sea cucumbers: teatfish *Holothuria (Microthele)* spp.
- Randrianandrasana J., Behivoke F., Razakandrainy A. and Todinanahary G. Towards sustainable octopus and sea cucumber fishing: Use of half-sphere artificial reefs for habitat restoration.
- Yussuf Y. and Yahya S. Setting baselines for large scale hatchery production of high value tropical sea cucumber *Holothuria scabra* (Jaeger, 1833) in Zanzibar, Tanzania.
- Zafinirina D. and Rakotovoav J. Study of the diversity and effect the vibrios on *Holothuria scabra* raised at the IOT in Toliara (Madagascar).
- Hery Lova Tiana Charlot R. and Kluckow T. Community-based sea cucumber aquaculture in the Velondriake locally managed marine area: A community centric approach to governance.
- Maka O., Pascal B. and Todinanahary G. Wild holothurian fishery in the southwest Madagascar.
- Issangya P. Particle size and patch selectivity in *Holothuria atra* and *Holothuria leucospilota*.
- Steinmann N. We are family: High geneflow in sandfish (*Holothuria scabra*) in Zanzibar, Tanzania.
- Lavitra T., Pascal F., Pascal B., Razanakoto I., Eeckhaut I. and Todinanahary G. Towards development of a promising community-based polyaquaculture involving sea cucumber (*Holothuria scabra*) seaweed (*Kappaphycus alvarezii*) and corals in Madagascar.

#### *4<sup>th</sup> Congress of Latino-American Echinoderms – La Paz, Mexico, 10–15 November 2019*

More information at: <http://rediberoamericanaequinodermos.com/programa>

### 2020 symposiums and calls for proposals

#### *Global Summit on Climate Change (GSCC-2020) London, UK, 15–16 June 2020*

On behalf of the board members, we are pleased to write and invite you to join our congress as a speaker. For more details, see: <https://www.climatechangecongress.com/>

#### *6<sup>th</sup> International EcoSummit, Gold Coast, Australia, 21–25 June 2020*

EcoSummit 2020 co-chairs are:

- Jan-Olaf Meynecke, Griffith University, Australia
- Robert Costanza, Crawford School of Public Policy at Australian National University, Australia
- B. Larry Li, University of California, Riverside, USA

Visit the EcoSummit 2020 website: <http://www.ecosummitcongress.com/>

#### *ECSA 58 & EMECS 13 Conference – Hull, United Kingdom, 7–11 September 2020*

Estuarine and coastal seas in the Anthropocene – Structure, functions, services and management

During the 12th International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS 12) in Pattaya, Thailand, representatives from ECSA and the EMECS Science and Policy Committees approved a joint ECSA 58-EMECS 13 Conference to be held in Hull, UK in 2020.

More information at: <https://ecsa.international/event/2020/joint-ecsa-58-emecs-13-conference-hull-september-2020>

#### *9<sup>th</sup> North American Echinoderm Conference – Charleston, Oregon, 13–18 June 2020*

I am pleased to announce that the 9<sup>th</sup> North American Echinoderm Conference will be held at the Oregon Institute of Marine Biology in Charleston, Oregon from 13 to 18 June 2020. You can find information about registration, presenting, lodging, travel, and other details on our website at: <https://www.echinoderm.org>

If you have any questions please do not hesitate to contact us through the website, on Facebook (<https://www.facebook.com/echinoconf/>), or me directly. We began accepting abstract submissions on 1 September 2019.

**Julie Schram** – Postdoctoral Researcher, University of Oregon, Oregon Institute of Marine Biology. Email: [jschram@uoregon.edu](mailto:jschram@uoregon.edu)

#### *Echinoderm Session at NSA Meeting in March April 2020*

A session on echinoderms will be organised at the next National Shellfisheries Association meeting, which will be held in Baltimore, Maryland, USA from 29 March to 2 April 2020.

More information at: <https://www.shellfish.org/annual-meeting>

#### *5<sup>th</sup> World Conference on Marine Biodiversity – Auckland, New Zealand, 13–16 December 2020*

This is the premier world conference on all aspects of marine biodiversity, having being held previously in Valencia Spain, Aberdeen Scotland, Qingdao China, and Montreal Canada. It is led by the over five-year old academic body, the International Association of Biological Oceanography.

More information at: <https://www.wcmb2020.org/>

### *ICRS 2020 Bremen, Germany – 14<sup>th</sup> International Coral Reef Symposium, 5–10 July 2020*

We invite all who are interested in contributing phylogenetic and biodiversity insights on reef organisms to submit abstracts for the International Coral Reef Symposium 2020. This session in Theme 2, Species and their populations, asks the question: How can we use phylogenetic tools to better understand biodiversity, evolutionary patterns, and processes?

More information at: <http://www.icrs2020.de/program/session-program/#c234>

### *IUCN World Conservation Congress 2020 – Marseille, France, 10–12 June 2020*

More information at: <https://www.iucncongress2020.org/>

### *NWO Caribbean Research programme*

The new call for the NWO Caribbean Research programme is open for applications. This call has a total budget of EUR 7.18 million, and comprises a special approach. NWO is seeking two programme chairs who will each set up a multidisciplinary research programme: one with a focus on sociocultural issues and based in the Leeward Islands, and one focusing on natural science issues and based in the Windward Islands.

The call for proposals can be downloaded from:

<https://www.nwo.nl/en/funding/our-funding-instruments/enw/caribisch-research-call-for-programme-chairs/caribisch-research.html>

## Other information on sea cucumbers

### *How sea cucumbers can help the ocean*

Sea cucumbers are a prized aphrodisiac in China. However, like many coastal species, they have been chronically overfished. One remote community in Madagascar has started a pioneering coastal-farming project with astonishing results. Watch the excellent video produced by The Economist at: <https://www.woi.economist.com/how-sea-cucumbers-can-help-the-ocean/>

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