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Asia–Pacific tropical sea cucumber aquaculture

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Research that works for developing countries and Australia

Asia–Pacific tropical sea cucumber aquaculture

**Proceedings of an international symposium held in
Noumea, New Caledonia, 15–17 February 2011**

Editors: Cathy A. Hair, Timothy D. Pickering and David J. Mills



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2012

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Hair C.A., Pickering T.D. and Mills D.J. (eds) 2012. Asia–Pacific tropical sea cucumber aquaculture. Proceedings of an international symposium held in Noumea, New Caledonia, 15–17 February 2011. ACIAR Proceedings No. 136. Australian Centre for International Agricultural Research: Canberra. 209 pp.

ACIAR Proceedings - ISSN 1038-6920 (print), ISSN 1447-0837 (online)

ISBN 978 1 921962 34 9 (print)

ISBN 978 1 921962 35 6 (online)

Technical editing by Mason Edit, Adelaide, Australia

Design by Clarus Design Pty Ltd, Canberra, Australia

Printing by Canprint Communications Pty Ltd, Canberra, Australia

Cover: Adult sandfish, Goulburn Island, Northern Territory, Australia.

(Photo: Wayne Tupper)

Foreword

Stocks of high-value sea cucumber species have been overexploited throughout the Asia–Pacific region. Their high value as a food and medicine in China and other parts of Asia, the ease of capture, the apparently insatiable demand for them and the lack of effective management indicate that this situation is unlikely to change any time soon. Better fisheries governance must be a priority; however, in many cases, the situation is beyond the point where improved management alone can restore populations.

Sea cucumber aquaculture is a recurring priority in development aspirations for Asian and Pacific island nations, driven by the depletion of stocks from overfishing and the subsequent loss of livelihoods and export dollars. Fortunately, for a small number of species, aquaculture and farming activities can assist in conserving wild stocks, while also generating income and boosting natural recovery. Consequently, there has been considerable research on the culture of tropical sea cucumbers in the past two decades.

In 2003 the United Nations Food and Agriculture Organization (FAO) held a large workshop on the advances in sea cucumber aquaculture and management in Dalian, China—the first of its kind for research in this field. Today, there is still enormous interest in the topic, and the research has reached a critical juncture. In the Asia–Pacific region, most studies have concentrated on the ‘sandfish’ (*Holothuria scabra*). Large numbers of juveniles can be reliably produced in hatcheries using relatively simple techniques, and these can be on-grown and transferred to ponds or suitable inshore marine habitats where they can reach commercial size in 1–3 years. The Australian Centre for International Agricultural Research (ACIAR) has provided significant, long-term research investment into sandfish culture in the region (primarily through the WorldFish Center). Projects have investigated large-scale hatchery culture of sandfish (Solomon Islands), techniques for releasing cultured juveniles into the wild (New Caledonia), and sea ranching and pond culture (the Philippines, Vietnam and Australia).

It is timely to review this work, together with recent research from other parts of the world, in order to encourage collaboration and technology transfer, and to develop an effective way to ensure that the technology can deliver real benefits to poor rural communities. To this end, ACIAR, in collaboration with the Secretariat of the Pacific Community (SPC), organised a symposium on tropical sea cucumber aquaculture at SPC Headquarters in Noumea, New Caledonia, in February 2011. Although the principal focus was on ACIAR work, particularly in the Asia–Pacific region, researchers from other parts of the world were invited to provide additional expertise.

The symposium identified knowledge gaps and highlighted researchable topics for future developments in sea cucumber aquaculture. These proceedings will be a valuable resource for all practitioners in this field.

A handwritten signature in black ink, appearing to read 'Nick Austin', with a long horizontal flourish extending to the right.

Nick Austin
Chief Executive Officer
ACIAR

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Abbreviations

1-MeA	1-methyladenine	MPA	marine protected area
ACIAR	Australian Centre for International Agricultural Research	MH-IVF	IVF technique developed at Madagascar Holothurie S.A.
Aj-GSSL	<i>Apostichopus japonicus</i> gonad-stimulating substance-like (molecule)	MH.SA	Madagascar Holothurie Société Anonyme
AVS	acid-volatile sulfur	MIS	maturation inducing substance
BL	body length	NGO	non-government organisation
BML	Bolinao Marine Laboratory	NPV	net present value
BV	body volume	NT	Northern Territory
BW	body weight	OFCF	Overseas Fishery Cooperation Foundation (Japan)
CFD	coelomic fluid density	OMI	oocyte maturation inductor
CFV	coelomic fluid volume	PCF	perivisceral coelomic fluid
CFW	coelomic fluid weight	PICs	Pacific island countries
CMT	customary marine tenure	PICTs	Pacific island countries and territories
DMP	dimercaptopropanol	PNG	Papua New Guinea
DO	dissolved oxygen	RIA3	(Vietnamese) Research Institute for Aquaculture No. 3
DTT	dithiothreitol	SD	standard deviation
EDTA	ethylenediaminetetraacetic acid	SE	standard error
FSM	Federated States of Micronesia	SEAFDEC–AQD	Southeast Asian Fisheries Development Center – Aquaculture Department
GMP	good management practice	SPC	Secretariat of the Pacific Community
GSS	gonad-stimulating substance-like	TMD	Trans’Mad-Développement
GSSL	gonad-stimulating substance-like	UPMin	University of the Philippines Mindanao
GSSL-IVF	gonad-stimulating substance-like in-vitro fertilisation (technique)	UPMSI	University of the Philippines Marine Science Institute
GVBD	germinal vesicle breakdown	USP	University of the South Pacific
HACCP	hazard analysis critical control point	UVSW	UV-treated sea water
ind	individuals	WorldFish	WorldFish Center
IVF	in-vitro fertilisation		
LMMA	locally managed marine area		

Acknowledgments

The symposium was made possible through funding from the Australian Centre for International Agricultural Research (ACIAR) and the Secretariat of the Pacific Community (SPC). Particular thanks to Dr Chris Barlow, ACIAR Fisheries Program Leader, who originally suggested convening a group of experts to review the status and future of tropical sea cucumber aquaculture research. We also wish to acknowledge Mike Batty and Robert Jimmy of SPC for their invaluable support and in-kind assistance, including providing the venue for the symposium (the Jacques Iekawé Conference Centre at the SPC headquarters in New Caledonia) and use of the secretariat. Various SPC staff members assisted with other important tasks—thanks go to the translation team, the travel desk and the information section. In particular, we thank Genevieve Mirc, who worked tirelessly to smooth the way for international participants and coordinate the logistics associated with holding the symposium. We extend our gratitude to Aymeric Desurmont for preparing the symposium website and Mrs Helena Heasman for producing the book of abstracts. The symposium was chaired by Dr Geoff Allan (of ACIAR at that time) and Dr Tim Pickering (SPC). We appreciate the efforts of several colleagues who also provided support and advice before, during and after the symposium, especially Dr Steven Purcell of the Southern Cross University's National Marine Science Centre.

We thank all the participants for their enthusiasm, and for freely sharing their expertise and ideas to make the symposium a success. Their combined efforts show the way forward for the next decade of research into the dynamic and promising field of culture and grow-out of sea cucumbers for improved livelihoods of coastal communities.

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