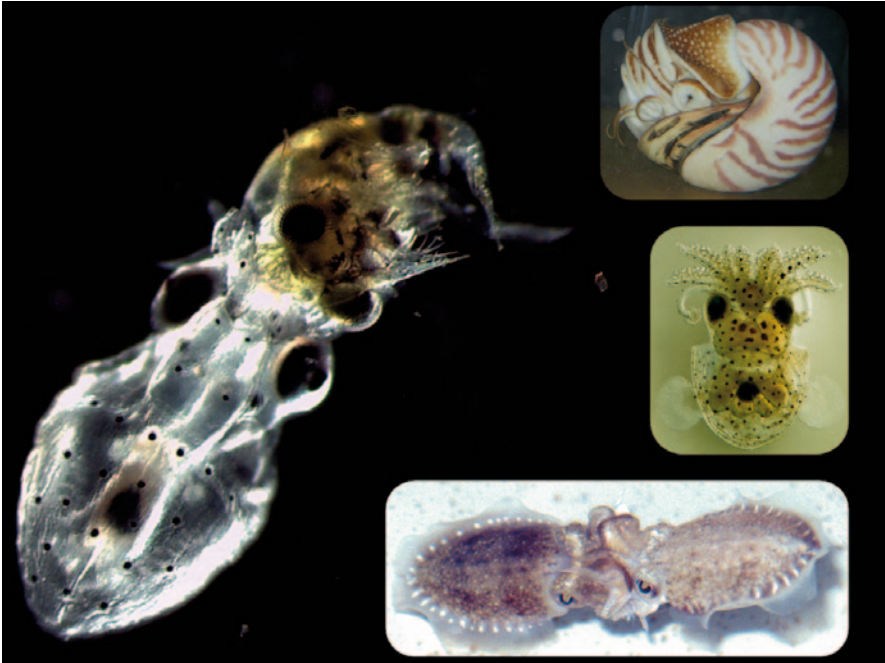


Cephalopod Culture



Background: Newly born *Octopus vulgaris* paralarvae feeding on *Cancer pagurus* zoea (Photo by Manuel Nande) Top right corner: *Nautilus pompilius* (Fig. 10.1, Photo by Gregory Barord) Middle right side: *Euprymna hillebergi* hatchling (Fig. 15.4, Photo by Jaruwat Nabhitabhata) Bottom right corner: *Sepiella inermis* broodstock (Fig. 13.1, Photo by Jaruwat Nabhitabhata)

José Iglesias • Lidia Fuentes • Roger Villanueva
Editors

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 Springer

Editors

José Iglesias
Centro Oceanográfico deVigo
Instituto Español de Oceanografía (IEO)
Vigo
Pontevedra
Spain

Roger Villanueva
Institut de Ciències del Mar (CSIC)
Barcelona
Spain

Lidia Fuentes
Centro Oceanográfico deVigo
Instituto Español de Oceanografía (IEO)
Vigo
Pontevedra
Spain

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Preface

Cephalopods—octopuses, squids, cuttlefishes and *nautilus*—are arguably the most intelligent, and perhaps charismatic, invertebrates on the planet. They occur in all the world’s oceans, from the intertidal areas to the deep sea. But, why culture cephalopods? For food, is the instinctive answer—high growth rates and short life spans make cephalopods ideal candidates for commercial aquaculture since they have the potential to rapidly reach market size.

However, as ‘*Cephalopod Culture*’ makes clear, the reasons for culturing cephalopods are more varied. Cephalopod species have been used as model organisms in neurobiology since the early twentieth century: they were, for example, the ‘lab rat’ for the Nobel Prize winning work of Alan L. Hodgkin and Andrew F. Huxley on the initiation and propagation of nerve impulses. Also, as their position as a neurological model was cemented, it became scientifically important in the latter half of the twentieth century to perfect small scale cephalopod culture protocols. At the same time, the world fishery potential for cephalopods was being realised, with world catches rising eight-fold as many finfish stocks declined.

However, some cephalopod stocks are now overfished, and others are at maximum potential: can large commercial scale culture of cephalopods provide a solution? ‘*Cephalopod Culture*’ draws on the expertise of nearly 50 cephalopod researchers from across four continents to provide a thorough scientific reference on the state of the art of cephalopod culture today. Tracing the history of cephalopod culture, this book provides a wealth of information on the constraints and bottlenecks in the culturing process, paying particular attention to the problems of feeding planktonic early life stages, whose complex behaviours and nutritional requirements require the provision of live prey.

The diversity of cephalopods, and their wide variation in life history strategies (eggs of some species hatch to relatively large benthic ‘miniature adults’ whilst other species hatch to planktonic stages just a few millimetre in length), means that species have unique culture needs. This is where ‘*Cephalopod Culture*’ excels. With 16 chapters dedicated to in-depth culturing methods for particular species, this book provides a laboratory manual that distils all the recently published research on each species, as well as detailing system requirements and management. These chapters, written by experts in cephalopod culture, are an essential read for

students, technicians, amateur aquarists, researchers attempting to culture species as yet uncultured, researchers attempting to improve yields or reduce costs, those in industry looking to upscale cephalopod culture enterprises for food production, as well as suppliers to the aquarium trade.

'*Cephalopod Culture*' also looks to the future. Recent breakthroughs, such as the successful rearing of large octopus hatchlings on a wholly artificial diet of squid paste, are highlighted, as are areas requiring further research; for example, there is a need to understand better the nutritional requirements of planktonic hatchlings so that appropriately enriched zooplankton can be raised as prey items.

Additional economic benefits of cephalopod culture are also emphasised. These include restocking, as has been successfully achieved for octopus in the Seto Inland Sea of Japan; pharmaceutical exploitation of antibacterial and potential anti-cancer activities reported from squid ink; the use of modified cuttlebone in tissue engineering; and the many and varied uses of cuttlefish oil.

In all, this is a pioneering text, which draws together a vast array of knowledge on cephalopod culture and provides the foundation for future advances in this significant field.

President, Cephalopod International
Advisory Council

Dr. Louise Allcock

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Contributors

José Pedro Andrade CCMAR-CIMAR L.A., Centro de Ciências do Mar do Algarve, Universidade do Algarve, Campus de Gambelas, Faro, Portugal

Gregory J. Barord Biology Department, Brooklyn College, City University of NY Graduate Center, Brooklyn, NY, USA

Jennifer A. Basil Biology Department, Brooklyn College, City University of NY Graduate Center, Brooklyn, NY, USA

Sigurd von Boletzky Observatoire Océanologique, CNRS, Laboratoire Arago, Banyuls-sur-Mer, France

Claudia Caamal-Monsreal Unidad Multidisciplinaria de Docencia e Investigación, Facultad de Ciencias, Universidad Nacional Autónoma de México (UNAM), Puerto de Abrigo s/n Sisal, Yucatán, México

Jesús Cerezo Valverde IMIDA-Acuicultura, Consejería de Agricultura y Agua de la Región de Murcia, Murcia, Spain

Pedro Domingues Centro Oceanográfico de Vigo, Instituto Español de Oceanografía, Vigo, Spain

Ana Farías Instituto de Acuicultura, Sede Puerto Montt, Universidad Austral de Chile, Puerto Montt, Chile

Lidia Fuentes Oceanographic Center of Vigo, Instituto Español de Oceanografía (IEO), Vigo, Spain

Pedro Gallardo Unidad Multidisciplinaria de Docencia e Investigación, Facultad de Ciencias, Universidad Nacional Autónoma de México (UNAM), Puerto de Abrigo s/n Sisal, Yucatán, México

José García García Consejería Agricultura, Agua y Medio Ambiente de la Región de Murcia, IMIDA, Murcia, Spain

Benjamín García García IMIDA-Acuicultura, Consejería de Agricultura y Agua de la Región de Murcia, Murcia, Spain

Camino Gestal Instituto de Investigaciones Marinas (IIM), CSIC, Vigo, Spain

José Iglesias Oceanographic Center of Vigo, Instituto Español de Oceanografía (IEO), Vigo, Spain

Yuzuru Ikeda Department of Chemistry, Biology and Marine Sciences, Faculty of Science, University of the Ryukyus, Nishihara, Japan

Noussithé Koueta Laboratoire de Biologie des Mollusques Marins et des Ecosystèmes Associés: BioMEA, Université de Caen, Caen Cedex, France

CNRS INEE—FRE3484 biomea Biologie des Mollusques marins et des Ecosystèmes Associés, Esplanade la Paix, Université de Caen, Caen Cedex, France

Estelle Le Bihan IVAMER, Innovation Marine, Thury-Harcourt, France

Qi Li Fisheries College, Ocean University of China, Qingdao, China

Xiang-Zhi Lin Third Institute of Oceanography, SOA, Xiamen, China

Chang Liu Fisheries College, Ocean University of China, Qingdao, China

Zhao-Sheng Liu Fisheries College, Ocean University of China, Qingdao, China

Manuel Luaces Arrecifes del Atlántico S.L., Muxía, A Coruña, Spain

Maite Mascaró Unidad Multidisciplinaria de Docencia e Investigación, Facultad de Ciencias, Universidad Nacional Autónoma de México (UNAM), Puerto de Abrigo s/n Sisal, Yucatán, México

Jennifer Mather University of Lethbridge, Lethbridge, AB, Canada

Óscar Monroig Instituto de Acuicultura Torre de la Sal (IATS-CSIC), Castellón, Spain

Institute of Aquaculture, School of Natural Sciences, University of Stirling, Scotland, UK

Jaruwat Nabhitabhata Excellence Centre for Biodiversity of Peninsular Thailand (CBIPT), Faculty of Science, Prince of Songkla University, Hatyai, Songkhla, Thailand

Juan Carlos Navarro Instituto de Acuicultura Torre de la Sal (IATS-CSIC), Castellón, Spain

Michelle K. Nishiguchi Department of Biology – MSC 3AF, New Mexico State University, Las Cruces, NM, USA

Alberto Olivares Facultad de Ciencias del Mar y de Recursos Biológicos, Universidad de Antofagasta, Antofagasta, Chile

Cristina Pascual Unidad Multidisciplinaria de Docencia e Investigación, Facultad de Ciencias, Universidad Nacional Autónoma de México (UNAM), Puerto de Abrigo s/n Sisal, Yucatán, México

Graham J. Pierce University of Aberdeen, Newburgh, Aberdeenshire, UK

CESAM & Departamento de Biologia, Universidade de Aveiro, Aveiro, Portugal

Julio Portela Centro Oceanográfico de Vigo, Instituto Español de Oceanografía (IEO), Vigo, Spain

Yao-Sen Qian Fisheries College, Ocean University of China, Qingdao, China

Ocean Fishery Station of Ganyu, Lianyungang, China

Manuel Rey-Méndez Departamento de Bioquímica y Biología Molecular, Facultad de Biología, CIBUS, Campus Vida, Universidad de Santiago de Compostela, Santiago de Compostela, A Coruña, Spain

Carlos Rosas Unidad Multidisciplinaria de Docencia e Investigación, Facultad de Ciencias, Universidad Nacional Autónoma de México (UNAM), Puerto de Abrigo s/n Sisal, Yucatán, México

Francisco Javier Sánchez Instituto Español de Oceanografía (IEO), Oceanographic Center of Vigo, Vigo, Spain

David Scheel Alaska Pacific University, Anchorage, AK, USA

Susumu Segawa Department of Ocean Sciences, Faculty of Marine Science, Tokyo University of Marine Science and Technology, Minato-ku, Tokyo, Japan

António V. Sykes CCMAR-CIMAR L.A., Centro de Ciências do Mar do Algarve, Universidade do Algarve, Campus de Gambelas, Faro, Portugal

Íker Uriarte Instituto de Acuicultura, Sede Puerto Montt, Universidad Austral de Chile, Puerto Montt, Chile

Carlos Veiga Samertolameu S. Coop. Galega, Moaña, Pontevedra, Spain

Helene Viala IVAMER, Innovation Marine, Thury-Harcourt, France

Erica A. G. Vidal Centro de Estudos do Mar (CEM), Universidade Federal do Paraná (UFPR), Cx. P. 61, Pontal do Paraná PR, 83255-976, Brazil

Center for Marine Studies, University of Parana—UFPR, Pontal do Paraná, PR, Brazil

Roger Villanueva Institut de Ciències del Mar (CSIC), Barcelona, Spain

Zhao-Kai Wang Third Institute of Oceanography, SOA, Xiamen, China

Óscar Zúñiga Facultad de Ciencias del Mar y de Recursos Biológicos, Universidad de Antofagasta, Antofagasta, Chile

Wei-Bing Zheng Third Institute of Oceanography, SOA, Xiamen, China

Xiao-Dong Zheng Fisheries College, Ocean University of China, Qingdao, China