

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.

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Cephalopod Culture

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