



**Lobsters: Biology, Fisheries and Aquaculture, 2019.** E. V. Radhakrishnan, Bruce F. Phillips and Gopalakrishnan Achamveetil (eds). First Edition. Springer Singapore. xiv + 677 pages. Price: 207,99€. ISBN (eBook): 978-981-329-094-5.

Today, aquaculture is known as a growing industry in the world. This important industry plays a special role in the world's food supply<sup>1,2</sup>. Therefore, the importance of aquaculture in today's world is not hidden from anyone.

Lobsters are a variety of crustacean that is highly valued in the global seafood market due to its delicious meat, rich protein, low fat, and vitamins A, B<sub>2</sub>, B<sub>3</sub>, B<sub>6</sub>, B<sub>12</sub>, phosphorus, iron, and calcium. In addition, the special and complex biology of lobsters has always attracted the attention of scientists.

Lobsters, as a group of crustaceans, have become particularly important in the aquaculture industry over the past years. So far, various researches have been done in the form of books and papers about lobsters. However, the need for an update reference that focuses on the biology of lobsters and their breeding is essential. The book under review contains 15 chapters, which we briefly review here.

The first chapter is an introduction to lobsters. In this chapter, the biological and ecological characteristics of lobsters, and in addition, the importance of these organisms in the fisheries and aquaculture industry is examined.

Chapter 2 presents a new checklist of marine lobster species that have been described around the world. According to this checklist, the number of lobster species is 260, which belongs to 6 families. These families are: Glypheidae, Palinuridae, Enoplometopidae, Nephropidae, Polychelidae and Scyllaridae.

Chapter 3 focuses on lobster fauna in India, which is remarkable in its kind. Of course, it is better for authors to study the fauna of lobsters in other important areas (or other countries) as well, as this could introduce readers to lobster fauna in other parts of the world.

Chapter 4 discusses the application of molecular tools in systematics and population genetics of lobsters. This chapter addresses a number of issues, some of which include molecular identification and phylogenetic studies, the identification of lobster species, and the use of molecular tools in taxonomic studies. In a significant part of this chapter, the research on population genetics in lobsters is also discussed.

Chapter 5 focuses on the ecology and global distribution of lobsters. This chapter first discusses the general distribution of lobsters. The authors state that the lobsters are distributed from shallow coastal waters to deep waters in tropical, subtropical, temperate and polar zones. This chapter examines the global distribution of Palinurid and Scyllarids lobsters. Also, various ecological aspects such as habitat type and habitat suitability are studied.

In chapter 6, the moult cycle, growth, reproduction, and nutrition in lobsters are examined. The authors explain the moult cycle, in which many biochemical, physiological, and morphological changes occur in lobsters. In another part of this chapter, the growth of lobsters and the environmental factors that affect them are studied. This chapter also discusses nutritional behaviour and nutritional ecology.

Chapter 7 focuses on lobster fisheries in India and the countries bordering the Indian Ocean. This chapter first discusses the global rate of fishery production and the contribution of lobsters in this sector. The authors state that the lobsters contribute only 0.3% of total global fisheries production. One of the most important features of this chapter is the use of statistical charts, which are interesting and help the reader to understand the subject.

Chapter 8 explores the challenges facing the lobster fisheries and emphasizes on the proper management of this sector. In this chapter, the authors examine the challenges of the lobster fisheries on a case-by-case basis in different areas such as Torres Strait (Australia), Bahamas (Indonesia), Florida and Western Australia.

Chapter 9 discusses the reproductive biology of spiny and slipper lobsters. This chapter examines the morphological differences between the males and females of lobsters, known as sexual dimorphism. In addition, the physiological aspects of males and female and their breeding in different seasons and conditions are also examined.

Chapter 10 focuses on larvae production of lobsters and mariculture. This chapter fully explains the biological characteristics of marine lobsters, the conditions required for their breeding, and management issues.

In chapter 11, the authors introduce planktonic larvae of slippery and spiny lobsters, known as phyllosoma. They suggest that phyllosoma larvae can use gelatinous zooplankton as food. Due to this issue, this chapter focuses on the nutrition of phyllosoma larvae from gelatinous zooplankton and examines the nutritional value of gelatinous zooplankton.

Chapter 12 refers to the development of lobster farming in Indonesia and Vietnam. The authors state that these countries have made significant strides in the culture of lobsters and their trade. This chapter emphasizes that the success of Indonesia and Vietnam in aquaculture and lobster trade could lead to their economic development. It should be noted that in an important part of this chapter, the history of Indonesia and Vietnam in aquaculture and lobster trade is examined, and the lobster species that are bred in these countries are introduced.

Chapter 13 is one of the most important chapters in this book, focusing on the health of lobsters in aquaculture systems. In general, this chapter discusses various diseases in lobster breeding systems. The authors refer to the most common diseases in lobster aquaculture, some of which are: bacterial diseases (Vibriosis, Milky White Disease Syndrome and Gaffkaemia), viral diseases [*Panulirus argus* virus 1 (PaV1) and White Spot Syndrome Virus (WSSV)] and fungal infections (Lagenidium and Burnspot). In this chapter, suitable and useful illustrations of each disease are presented, which are very attractive for readers.

Chapter 14 focuses on the post-harvest and lobster marketing processes. The authors introduce four commercial species of lobsters, including *Homarus americanus*, *H. gammarus*, *Panulirus argus*, and *Nephrops norvegicus*. Also,

they study post-harvest processes such as packaging, transportation, storage, quality and marketing.

The final chapter (chapter 15) discusses future prospects for lobster fisheries. Authors point to several important issues in this chapter. They consider the assessment of lobster stocks and the executive restrictions on lobster fishery. The authors also emphasize that DNA-based measurements are needed to detect pathogens in lobsters, which should be considered in future research. In addition, they point to the impact of climate change on population genetics and lobster fishery. They argue that this important issue should be considered by researchers in future studies.

The present book has many positive and obvious features, some of which are mentioned:

(a) Disperse to a specific topic. So far, several books have been written on fish biology and aquaculture, but lit-

tle research has been done on the biological aspects and aquaculture of lobsters.

- (b) The present book is not limited to a specific area. Therefore, the information provided in it can be used by various researchers around the world.
- (c) At the beginning of each chapter, there is an abstract that briefly provides necessary information for readers.
- (d) Use of appropriate and expressive illustrations that attract the attention of the audience.
- (e) The book is an extremely comprehensive study of all aspects of lobster biology.
- (f) This book is a good study of lobsters for aquaculture. Therefore, it can provide the necessary information for lobster farmers.

In summary, the current book is a new reference that comprehensively examines

various aspects of the biology of lobsters and their importance in aquaculture. Given this, it can answer many questions of biologists and aquaculture. We recommend this book as a valid and updated reference to the scientific community of fisheries as well as other enthusiasts in this field. It is hoped that the information presented in this book will be useful in advancing the aquaculture industry.

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1. Radkhah, A. R. and Eagderi, S., *J. Ornam. Aquat.*, 2019, **6**, 1–11.
  2. Radkhah, A. R., *et al.*, *J. Ornam. Aquat.*, 2020, **7**, 7–15.
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