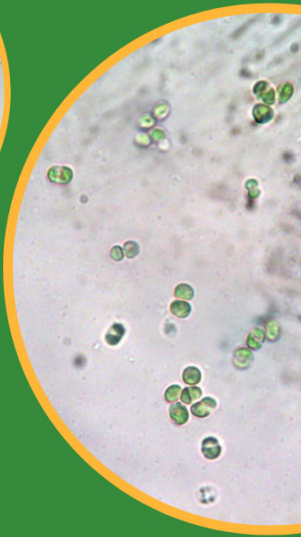
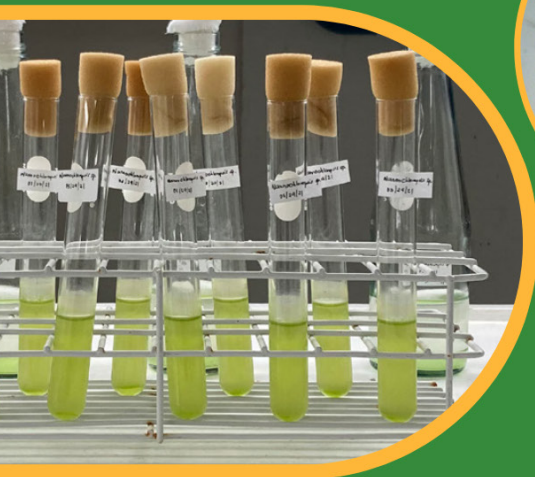


CULTURE OF  
**Natural Food**  
FOR FARMED FRESHWATER FISH  
AND PRAWN LARVAE

Reylan C. Gutierrez  
Mildred P. Rutaquio  
Frolan A. Aya  
Maria Rowena R. Romana-Eguia



Southeast Asian Fisheries Development Center  
AQUACULTURE DEPARTMENT  
Tigbauan 5021, Iloilo, Philippines  
[www.seafdec.org.ph](http://www.seafdec.org.ph)



**Aquaculture Extension Manual No. 71**

January 2023

# Culture of Natural Food for Farmed Freshwater Fish and Prawn Larvae

Reylan C. Gutierrez

Mildred P. Rutaquio

Frolan A. Aya

Maria Rowena R. Romana-Eguia



Southeast Asian Fisheries Development Center

**AQUACULTURE DEPARTMENT**

Tigbauan 5021, Iloilo, Philippines

[www.seafdec.org.ph](http://www.seafdec.org.ph)

# Culture of Natural Food for Farmed Freshwater Fish and Prawn Larvae

January 2023

ISSN 0115-5369



Published and printed by:

Southeast Asian Fisheries Development Center  
Aquaculture Department

Copyright © 2023  
Southeast Asian Fisheries Development Center  
Aquaculture Department



Some rights reserved. This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-sa/3.0/igo/>.

This license requires that reusers of the material give credit to the licensor, the Aquaculture Department of the Southeast Asian Fisheries Development Center. Reusers may distribute, remix, adapt, and build upon the material in any medium or format, for noncommercial purposes only and not in any way that suggests the licensor endorses the reuser. If others modify or adapt the material, they must license the modified material under identical terms.

---

**For comments and inquiries:** Training and Information Division  
SEAFDEC Aquaculture Department  
Tigbauan 5021, Iloilo, Philippines

(63-33) 330 7030  
(63-33) 330 7031  
devcom@seafdec.org.ph, aqdchief@seafdec.org.ph  
www.seafdec.org.ph

## SEAFDEC Aquaculture Department Library Cataloging-in-Publication Data

Gutierrez, Reylan C.

Culture of natural food for farmed freshwater fish and prawn larvae / Reylan C. Gutierrez, Mildred P. Rutaquio, Frolan A. Aya, Maria Rowena R. Romana-Eguia. -- Tigbauan, Iloilo, Philippines : Aquaculture Dept., Southeast Asian Fisheries Development Center, 2023, ©2023.

34 pages : color illustrations. -- (Aquaculture extension manual, 0115-5369 ; no. 71).

Includes bibliographical references.

1. Live food -- Cultures and culture media -- Handbooks, manuals, etc. 2. Freshwater fishes -- Larvae -- Feeding and feeds -- Handbooks, manuals, etc. 3. *Macrobrachium rosenbergii* -- Larvae -- Feeding and feeds -- Handbooks, manuals, etc. I. Rutaquio, Mildred P. II. Aya, Frolan A. III. Romana-Eguia, Maria Rowena R. IV. SEAFDEC. Aquaculture Department. V. Title.

SH 156 G88c 2023

MGO2023-01

# *Foreword*

Natural food plays a vital role in producing healthy and good quality fry. As live food organisms are essential food sources in larval rearing and fry production, SEAFDEC/AQD has been researching natural food since the 1970s along with its pioneering work on shrimp and milkfish larval rearing.

SEAFDEC/AQD has published two manuals specific to natural food, namely, “Culture of Marine Phytoplankton for Aquaculture Seed Production” in 2013 and “Culture of Rotifer (*Brachionus rotundiformis*) and brackishwater Cladoceran (*Diaphanosoma celebensis*) for aquaculture seed production” in 2015. Because these manuals are for the production of natural food for marine species, we are now pleased to publish another, this time catering to freshwater species.

The authors prepared this manual both in English and Filipino language, so we hope this manual gains a wide readership. May it be helpful to extension workers, hatchery operators, technicians, and all who would like to venture into freshwater aquaculture.



**DAN D. BALIAO**

SEAFDEC/AQD Chief

# *About the Manual*

This manual describes the various methods for culturing microalgae and other natural food organisms fed to freshwater fish/prawn larvae that are produced and reared in hatcheries. Hence, it will encourage/promote the use of natural food organisms, be these live or processed (concentrated algal pastes), as a means of optimizing larval fish/prawn production.

The manual was written purposely for local freshwater fish/prawn hatchery owners/operators and their technicians. The authors prepared the manual for hatchery operators to have a better understanding of how and why there is a need to culture natural food organisms as part of the standard larval rearing protocol and to increase/boost fish and/or prawn seedstock production.

# Contents

<i>Foreword</i>	v
<i>About the Manual</i>	vi
<i>Introduction</i>	1
<i>Importance of Cultured Live Food Organisms for Hatchery Rearing of Freshwater Fish and Prawn Larvae</i>	2
Feeding regimes for freshwater prawn and fish larvae	2
For giant freshwater prawn larvae	2
For bighead carp larvae	3
For Clariid catfish larvae	3
For silver therapon (“ayungin”) larvae	4
<i>Cultured Live Food Organisms</i>	5
Phytoplanktons	5
Biology of phytoplanktons	5
How to culture phytoplanktons	7
Zooplankton	17
Biology of zooplanktons	17
Culture of freshwater and/or euryhaline zooplankton	18
Nutritional value of planktons	20
Other live feeds	20
Brine shrimp or <i>Artemia</i> nauplii	20
<i>Tubifex tubifex</i>	23
<i>Appendices</i>	24
Appendix 1. Formulation of Culture Medium	24
Appendix 2. Methods of Counting Phytoplankton and Zooplankton	26
<i>References</i>	29
<i>Glossary</i>	32
<i>Acknowledgment</i>	32
<i>About the Authors</i>	33