

MARINE ECOLOGY

*A Comprehensive, Integrated Treatise on
Life in Oceans and Coastal Waters*

Volume III Cultivation
Part 2

Editor O. Kinne

MARINE ECOLOGY

A Comprehensive, Integrated Treatise on Life in Oceans
and Coastal Waters

Editor

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Hamburg, Federal Republic of Germany*

VOLUME III

Cultivation

Part 2

A Wiley-Interscience Publication

1977

JOHN WILEY & SONS

Chichester . New York . Brisbane . Toronto

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Library of Congress Cataloging in Publication Data (Revised):

Kinne, Otto.

Marine ecology.

Includes bibliographies

CONTENTS: v. 1. Environmental factors, 3 v.—
v. 2. Physiological mechanisms, 2 v.—v. 3. Cultivation.

1. Marine ecology—Collected works. I. Title.

QH541.5.S3K5 574.5'2636 79.121779

ISBN 0 471 01577 6 (vol. 3 pt. 2)

Printed in Great Britain at The Spottiswoode Ballantyne Press
by William Clowes & Sons Limited,
London, Colchester and Beccles.

MARINE ECOLOGY

A Comprehensive, Integrated Treatise on Life in Oceans
and Coastal Waters

Volume I ENVIRONMENTAL FACTORS

Volume II PHYSIOLOGICAL MECHANISMS

Volume III CULTIVATION

Volume IV DYNAMICS

Volume V OCEAN MANAGEMENT

FOREWORD

to

VOLUME III: CULTIVATION

'Cultivation' reviews the information which has accumulated on our present capacity for supporting marine micro-organisms, plants and animals under environmental and nutritive conditions which are, to a considerable degree, controlled. The volume is subdivided into three parts, containing the following chapters*:

Part 1

- Chapter 1: Introduction to Volume III
- Chapter 2: Cultivation of Marine Organisms:
Water-quality Management and Technology
- Chapter 3: Cultivation of Micro-organisms
- Chapter 4: Cultivation of Plants

Part 2

- Chapter 5.1: Cultivation of Animals—Research Cultivation

Part 3

- Chapter 5.11: Axenic Cultivation
- Chapter 5.2: Commercial Cultivation (Aquaculture)
- Chapter 6: Multispecies Cultures and Microcosms
- Chapter 7: Chemical Contamination of Culture Media:
Assessment, Avoidance and Control

We have made every effort to present comprehensive reviews, covering essential aspects of the cultivation of marine organisms. It soon became apparent, however, that only in a few cases, comparative, critical assessments of different culture methods and technologies were possible. Many publications suffer from insufficient detail, or even total lack of information regarding source, environmental history and nutrition of the organisms cultivated or the culture method employed. Exact data on environmental factors—such as light, temperature, salinity or dissolved gases—and on diet are absolute requirements for proper evaluation of the results presented. No less important are the origin of the organisms concerned, culture-water quality and technological aspects.

Culture methods are often an outcome of empiricism and intuition. A technique is tried, and if it works, the investigator sticks with it, rationalizing only afterwards the reasons for its application and success. The factors truly critical to success have

* See Editorial Note, p. vi.

rarely been pinpointed. Some portions of the reviews presented must, therefore, remain tentative, descriptive or pragmatical.

Cultivation is not an end in itself. It serves as a means to solve specific research problems. Due to the large variety of problems and the overwhelming diversity of marine life, a multitude of different culture methods have been developed. In fact, concepts, goals and techniques applied in cultivation diverge more than in other branches of marine ecology.

Most experiments conducted on marine organisms involve elements of cultivation. Micro-organisms, crustaceans, molluscs and fishes, for example, have been maintained, reared or bred in thousands of experiments. It was neither possible nor desirable to consider all publications in detail. We have attempted to settle the conflict between our intention to present comprehensive accounts and the need to avoid undue repetition by tabulating the information at hand or by referring to pertinent books or reviews.

I acknowledge with pleasure the support, advice and criticism received from the contributors, as well as from Drs. D. F. ALDERDICE, J. R. BRETT, H. P. BULNHEIM, G. PERSOONE, A. GAERTNER and D. SIEBERS. Additional supporters are mentioned at the end of the respective chapters. The assistance of M. BLAKE, V. CLARK, J. MARSCHALL, H. L. NICHOLS, I. SCHRITT and H. WITT is deeply appreciated.

O.K.

Editorial Note

The two chapters originally envisaged to comprise Part 3 of Volume III—Diseases of Plants and Diseases of Animals—will not be published in this form. Together with a general introduction, Chapter 9 will appear in a separate two-part book:

O. KINNE (Ed.) *Diseases of Marine Animals*, Wiley, London.

The reasons for this change in our original concept are (i) the fundamental importance of animal diseases not only for cultivation, but also for proper ecological assessment of both distribution and performance of marine organisms; (ii) the large amount of information available on diseases of marine animals; (iii) the rather restricted information presently at hand on diseases of marine plants.

CONTRIBUTOR
TO
VOLUME III, PART 2

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CULTIVATION

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