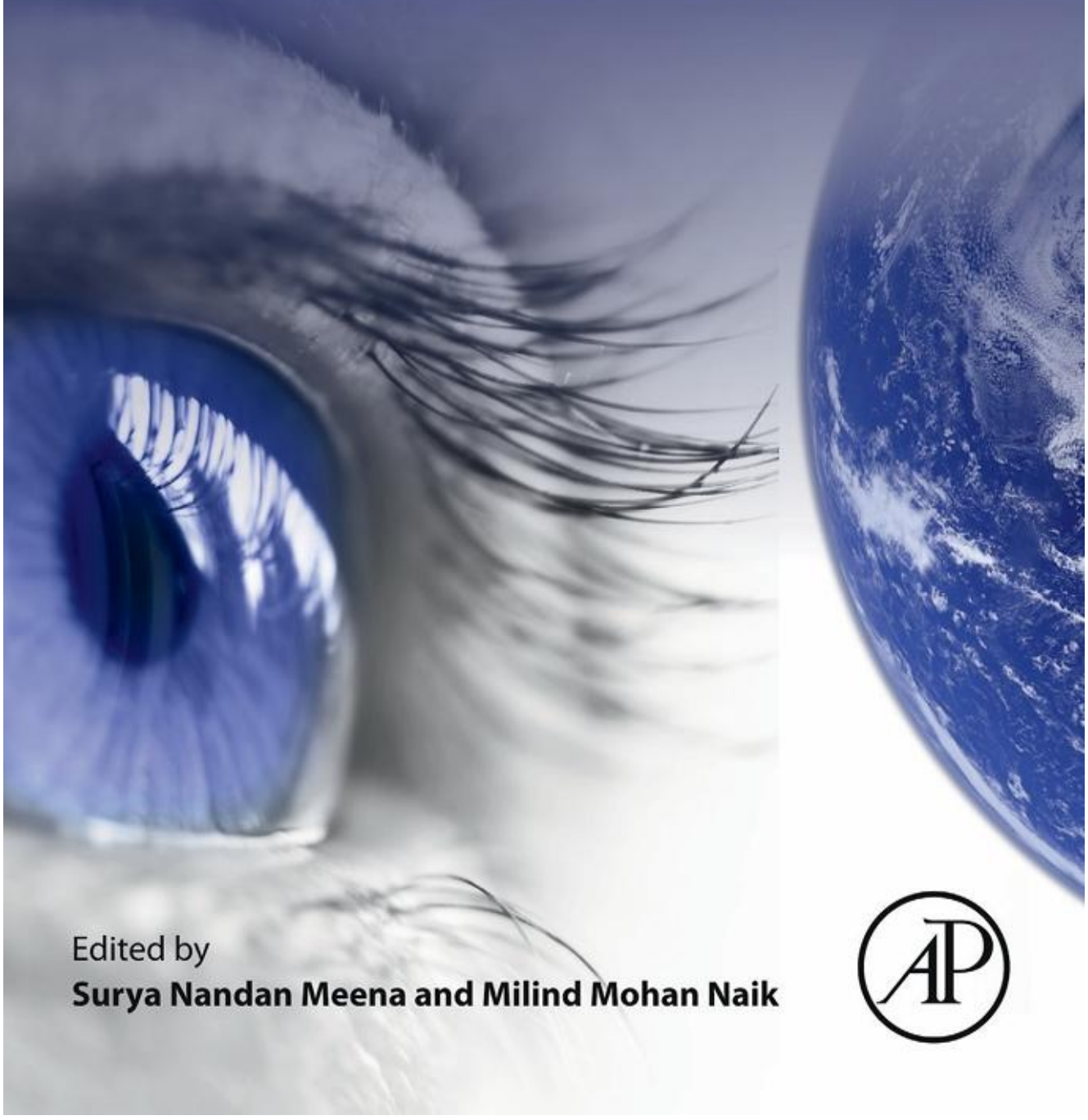
Advances in Biological Science Research

A Practical Approach



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ACADEMIC PRESS
An imprint of Elsevier

Academic Press is an imprint of Elsevier
125 London Wall, London EC2Y 5AS, United Kingdom
525 B Street, Suite 1650, San Diego, CA 92101, United States
50 Hampshire Street, 5th Floor, Cambridge, MA 02139, United States
The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, United Kingdom

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Library of Congress Cataloging-in-Publication Data
A catalog record for this book is available from the Library of Congress

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library

ISBN: 978-0-12-817497-5

Publisher: Andre G. Wolff
Acquisition Editor: Linda Versteeg-buschman
Editorial Project Manager: Sandra Harron
Production Project Manager: Poulouse Joseph
Cover Designer: Vicky Pearson Esser

Typeset by TNQ Technologies

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Chapter 14

Bacterial probiotics over antibiotics: a boon to aquaculture

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14.1 Introduction

Aquaculture is the active cultivation of aquatic organisms in a controlled environment to enhance their production [1]. A fast developing sector, aquaculture has now become an essential economic activity in many countries, with the total global production amounting to 80 million tonnes in 2016 (State of world fisheries and aquaculture, FAO, 2018). The report of World Aquaculture in 2012 stated that global production of farmed fish increased tremendously by 30% between 2006 and 2011, from 47.3 million tonnes to 63.6 million tonnes [2]. Over the last 2 decades, Asia has accounted for about 89% of world aquaculture production, with China contributing to around 61.5% followed by India (7.1%) (Food & Agricultural Organization, 2018). Aquaculture plays an important role in providing employment to thousands of skilled and unskilled workers, promoting economic income to farmers and catering to the increasing demand of seafood worldwide [3]. The United Nations FAO predicts that by 2020, 50% of the world's seafood requirement will be met by aquaculture, due to overexploitation of capture fisheries [4].

However, in large-scale production systems, where the farmed species are exposed to stressful situations, problems related to deterioration of environmental conditions and diseases often occur, resulting in serious economic losses. In several cases, intensive aquaculture has led to bacterial and viral outbreaks, which cause mass mortality in fish hatcheries and shrimp larviculture [5]. Some of the diseases include vibriosis (caused by *Vibrio anguillarum*, *Vibrio harveyi*, *Vibrio vulnificus*, *Vibrio parahaemolyticus*), aeromonasis (caused by *Aeromonas* spp.), edwardsiellosis (by *Edwardsiella anguillarum*, *Edwardsiella tarda*), pseudomonasis (caused by *Pseudomonas anguilliseptica*, *P. fluorescens*), streptococcosis (*Streptococcus agalactiae,*

Advances in Biological Science Research. https://doi.org/10.1016/B978-0-12-817497-5.00014-8