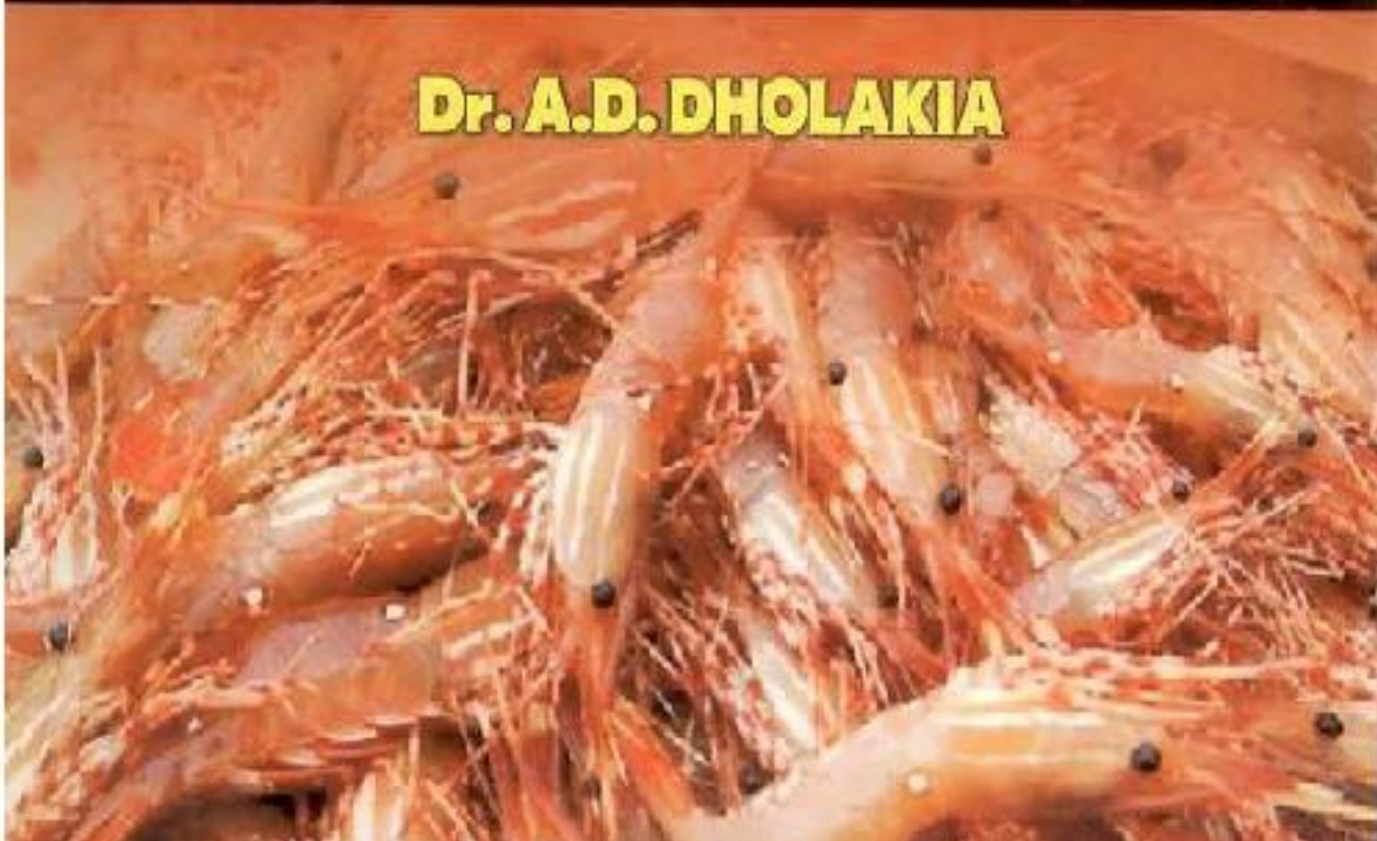


**Identification of
PRAWNS/SHRIMPS
OF INDIA
and their Culture**



Dr. A.D. DHOLAKIA



Identification of PRAWNS/SHRIMPS OF INDIA and their Culture

Dr. A.D. DHOLAKIA
M.Sc., LL.B. (Sp), Ph. D.
(Retd.) Research Officer and Head
Fisheries Research Station,
Junagadh Agricultural University, Sikka
Gujarat, India

2013

Daya Publishing House®
A Division of
Astral International Pvt. Ltd.
New Delhi - 110 002

© 2013 ANSHUMAN D. DHOLAKIA (b. 1947–)
Printed Format: 2010 Ebook: 2013
ISBN 978-93-83048-57-1

Despite every effort, there may still be chances for some errors and omissions to have crept in inadvertently. No part of this publication may be reproduced in any form or by any means, electronically, mechanically, by photocopying, recording or otherwise, without the prior permission of the copyright owners..

The views expressed in various articles are those of the authors and not of editor or publisher of the book..

Published by : **Daya Publishing House[®]**
A division of
Astral International (P) Ltd
81, Darya Ganj, Near Hindi Park,
Delhi Medical Association Road,
New Delhi-110002
Phone: +91-11-43549197, 23278134
Fax: +91-11-23243060
e-mail :info@astralint.com
website :www.astralint.com

Acknowledgement

I dedicate this book jointly to my wife Smt Sangita to whom I received utmost encouragement and appreciation. But for the help received from her to keep myself free from any domestic chore whatsoever, the writing of the book would not have been possible, and to Late Prof. N. D. Chhaya who was my guide in my Ph. D. Thesis “Marine prawn Fisheries and its culture in Saurashtra with special reference to *Penaeus merguencies deMan*”. I also express my gratitude to my late mother Smt. Jayshriben and father Shri Dwijendraray.

I am highly thankful to Shri A. U. Buch, Deputy Commissioner of Fisheries (Retired), Department of Fisheries, Government of Gujarat, Gandhinagar, for writing Foreword of this book. I am also highly thankful to Dr. D. C. Bhatt, Head Marine Sciences, Bhavnagar University, Bhavnagar for Recommending this book for the use of students and teachers.

Prof. Anshuman D. Dholakia

Foreword

I have seen the contents of this book and found that Prof. Dholakia has put tremendous and useful effort in identification of prawn and shrimp species of India. Early identification of the commercial species from the Mysis and Postlarvae will help to separate unwanted species from the culture batch. For precious identification at these stages, he has given drawing of each part of the body. For identification of adults he has given drawings and colour photographs wherever it is possible.

In this book he has given identification of 78 Marine water prawn and 17 freshwater shrimps totaling 95 prawn and shrimp species. Identification and culture activities were explained using 535 drawings, 87 colour photographs and 30 tables. Besides identification he has covered culture aspects also for this requirement of different parameters like Site selection, design and construction of culture pond, type of soil, stocking, feed nutrition requirement, feed preparation, method and quantity of feed distribution are explained and also possibilities of diseases observed in commercial cultured prawn/shrimp are given.

I know Dr. Dholakia since 1977. He has done his Ph. D. in marine Prawn Culture. He has done excellent work when he was in-charge of prawn culture laboratory at Okha. He has published many research papers. Looking to his experience, I am sure that this Book will be helpful to B. F. Sc. and M. F. Sc. students, teachers and research workers of Fisheries Faculty of respective colleges, technical officers/staff of fisheries, as well as to supervisors of prawn/shrimp culture farms. I wish him all success in his life.

Residence

*“Ashirwad” A/67-C Plot No 1006/2
Opp. S. T. Depot. Sector-7 C
Gandhinagar – 382007, Gujarat*

A.U. Buch

*Deputy Commissioner of Fisheries, (Retired)
Department of Fisheries, Govt. of Gujarat.
Gandhinagar, Gujarat*

Preface

Prawns are recognized as a major delicacy for the table and in many parts of the world prawn fisheries have developed extensively during the last forty years. Traditionally, prawning was a shallow-water fishery; prawns being trawled from coastal and estuarine waters; but with the increased demand for prawns, trawling and trapping have now been extended down to 400 fathoms.

The commercial prawns of India can be grouped in to Penaeid and non-penaeid. Penaeid form a little over 50 per cent of the total marine prawn catch, the rest being non-penaeid.

It is necessary to identify them and only commercially important and high demand prawn can be cultured for profitable business. In this book I have given identification of 78 Marine water prawn and 17 freshwater shrimps. Identification of prawn and shrimp of commercial importance is given from Mysis stage to Post larvae stages. Identification using carapace and how to identify prawn/shrimp in field are also given. I have tried to give justice to this subject with the help of 535 drawings, 87 colour photographs and 30 tables. In this book I have tried to cover identification of 95 prawn and shrimp species. The subject is justified using more than 90 references.

Different parameters like Site selection, design and construction of culture pond, type of soil, stocking, feed nutrition requirement, feed preparation, method and quantity of feed distribution, and some major diseases in commercial cultured prawn/shrimp are given. Culture method in details of marine prawn as well as freshwater shrimp is given. In this book the requirement of syllabus for B.F.Sc and M.F.Sc. approved by I.C.A.R. is also looked in to with respect to the subject of this book.

Details of selection of prawn/shrimp species for culture considering local condition are also discussed.

Looking to high demand of culture prawn due to eco-friendly and unpolluted environmental condition, business people would like to culture prawn/shrimp. This book will be highly helpful to them as well as to fishery students, teachers and research workers.

Prof. Anshuman D. Dholakia
201, Shashwat Apartment,
Nr. Vaibhav Laxmi Temple
B/H Drive-in-Cinema
Memnagar, Ahmedabad – 38 0052

Recommendation

I have seen the contents of this book. Looking to the high demand and taste of Prawn/Shrimps, it is necessary to know about them. Prof. Dholakia has tried to identify about 95 prawn/shrimp species in this book. He has also given the culture systems for both Marine as well as freshwater prawn/Shrimp.

In present days when day by day landings are decreasing, it is necessary to culture prawn/shrimp. It is my experience that many students and people are facing difficulty in identifying proper prawn/shrimp.

This is very important to identify prawn/shrimp properly before starting their culture. Efforts made by Prof. Dholakia is to be admired. I recommend using this book as reference book by students and teachers who are in this field may get proper guidance.

Prof. D.C. Bhatt
Head, (Marine Sciences) (Retd.)
Bhavnagar University, Bhavnagar

Contents

[Acknowledgement](#)

[Foreword](#)

[Preface](#)

[Recommendation](#)

[List of Figures](#)

PART I: IDENTIFICATION

1. Introduction

2. Identification of Mysis stages

[*Penaeus monodon*](#)

[*P.indicus*](#)

[*P.merguiensis*](#)

[*P.semisulcatus*](#)

[*Metapenaeus affinis*](#)

[*M.dobsoni*](#)

[*M.monoceros*](#)

[*M.brevicornis*](#)

[*Parapenaeopsis stylefera*](#)

[*Macrobrachium rosenbergii*](#)

[*Freshwater larval development*](#)

3. Identification of Post Larvae Stages

[Early post larvae \(up to PL\)](#)

[Key to the identification of early post larve stages found in the Brackish waters](#)

[Identification of juveniles of Metapenaeus](#)

[Key for the identification of first post larvae of five commercial prawn of India](#)

[Identification of base of carapace length \(CL\)](#)

Juveniles up to mm CL of *Metapenaeus affinis*

Juveniles up to mm CL of *M.dobsoni*

Juveniles up to mm CL *M.monoceros*

[Species wise identification of first post larvae](#)

Penaeus monodon

P.indicus

P.merguiensis

P.semisulcatus

P.japonicus

Metapenaeus affinis

M.dobsoni

M.monoceros

Parapenaeopsis stylefera

Comparison of distinguishing characters of post larvae of penaeids

Distribution of chromatophores and pigments

Comparison of first post larvae stages of five species

4. Field Identification

Distinguish Penaeus, Parapeneopsis and Metapenaeus species

Distinguish characters of marine and Chapter 08s

Key to the commercially important prawns of India, Family Penaeidae

Key for identification of family Pandalidae

Key to the identification of prawn of the family Sergestidae

Field key for the identification of commercially important adult penaeid prawns of India

Key to the species of Metapenaeus (Modified)

Key to the identification of different genera of Family Penaeidae

Comparison of the diagnostic characters of three species of Metapenaeus

5. Identification of Adult Prawn/Shrimp

Drawing and Taxonomic names of each part of Penaeid Prawns

Classification

Penaeus monodon

P. semisulcatus

P. indicus

P. merguensis

P. penicillatus

P. japonicus

P. vannamei

P. esculentus

P. plebejus

P. longistylus

P. latisulcatus

P. canaliculatus

P. carcinus

Distinguishing characters of similar looking type of penaeus

Metapenaeus classification

Metapenaeus dobsoni

M. monoceros

M. kutchensis

M. affinis

Comparison of the diagnostic feature of sp. of Metapenaeus

M. brevicornis

M. elegans

M. ensis

M. lysianassa

M. moyebi

M. stridulans

M. stebbingi

Parapeneopsis stylefera

P. sculptilis

P. acclivirostris

P. longipes

[P.cornuta](#)

[P.hardwickii](#)

[P.maxillipedo](#)

[P.jerryi](#)

[P.balssi](#)

[P.tenella](#)

[P.uncta](#)

[Family Penaeidae](#)

[Solenocerid shrimp](#)

[Solenocera indica](#)

[Solenocera pectinata](#)

[S.hextii](#)

[S.choprai](#)

[Family Sergestidae](#)

[Acetes indicus](#)

[Key to sexes of Acetes](#)

[Acetes serrulatus](#)

[Acetes japonicas](#)

[A.johni](#)

[A.erythreus](#)

[Family Sergestidae](#)

[Hippolysmate ensirostris](#)

[Aristeomorphawoodmasoni](#)

[Aristeus alcocki](#)

[Aristeus semidentatus](#)

[Atypopenaeus sternodactylus](#)

[Family Palaemonidae](#)

[Key to commercially important coastal spp.of Palaemonidae](#)

Fresh water Prawns

[Classification](#)

[Macrobrachium rosenbergii](#)

Identity and morphology

Mating and embryonic development

[Selected characteristics of Macrobrachium rosenbergii larvae and postlarvae](#)

Macrobrachium malcomsonii

[M.nipponense](#)

[M.lamarrei](#)

[Sexual dimorphism, Fecundity, Development in Prawn](#)

[Stages of Development](#)

[M.veliense](#)

[M.Kulsiense](#)

[M.nobilii](#)

[M.rude](#)

[M.idella](#)

[M.equidens](#)

M.scabricumlum

M .serenus

Palaemon tenuipes

Palaemon styleferus

Palaemon natator

P.affinis

P.longirostris

Identification of the basis of chemical characteristic

PART II: CULTURE

6. Culture System and Guidelines for Culture

History of prawn (Shrimp) culture

Prawn culture status

Findings at Global level

Findings at National level

Establishment of shrimp seed hatcheries

Guidelines for sustainable Aquaculture

7. Site Selection for Shrimp Farming

Introduction

Factors to be considered for selection of site

Ecological aspects

Water sources and quality: Salinity, pH, tidal characteristics

Environmental conditions

Currents prevailing in the area: Rainfall Evaporation rates, Pollution, Temperature, Soil

Type of soil: Soil acidity

Determination of acid sulphate soil

Construction in area of acid sulphate soils

Percolation rates: Load bearing capacity

Biological aspects

Seed resources: Predators, competitors boring animals, Vegetation

Social and Economic aspects

Type of area for coastal aquaculture

Intertidal zone, Super tidal zone, Low lying area

Site requirements and construction

Measuring soil pH

8. Pond Preparation

Objective

Chemical parameters for shrimp farm

Pond Preparation

Pond layout

A plan of shrimp farm

Construction of dikes

Feature of dikes

Water control gates

Type of gates: Main gate, Secondary gates, Inlet gates, Out let gates

Pond bottom conditioning

Procedure for drying the pond

Pond bottom sterilization, Liming the pond

Application of lime dosage

Procedure to overcome the acid sulphate

Problem

Eradication of predators

Chemical commonly used as piscicides with dosages

Deodar in pond water and its removal

Recommended chemicals for deodar the pond

9. Selection of Species for Culture

Biological factors

Growth rate, Ecological adaptability

Distribution of species

Reproduction characteristics, Larval development, Hardiness of animal

Economical factors

Market demand, Market price

Advantages and disadvantages of important cultivable shrimp species

10. Freshwater Prawn Farming

Dates of beginning, peak and end of seasons

Polyculture and integrated culture

Outdoor (secondary) nurseries

General management and water quality

Systems of management in grow-out ponds for fresh water prawns

The continuous system

The batch system

The modified batch system

Monoculture in temperate zones

Basic requirements and facilities for freshwater culture

Holding tank

Indoor (primary) nursery facilities

Nursery cages

Outdoor (Secondary) nurseries

Filling and stocking ponds

Feeding strategy

Survival and growth rate

Harvesting, grading and transport

Multiphase nursery system

Nursing in cages

Defining the pond, choosing its area and shape

Choosing its depth

Constructing the pond banks

Ponds with grass turfs

Gravel filter for exclude fish eggs and larvae

Discharge water from the ponds

Outlet structure

[Sizes of outlet pipes for ponds with monks](#)

Time taken to drain ponds with different drain pipe size

[Preparing pond](#)

[Aeration](#)

Oxygen transfer efficiencies of basic type of aerator

Lime requirements for treating the bottom of ponds

[Stocking](#)

[Holding post larvae before sale](#)

[Transporting post larvae](#)

[Pond size](#)

[General management, construction](#)

[Semi intensive monoculture in tropical zone](#)

[Stock estimation during the grow-out period](#)

[Size grading](#)

[Culture technology of Chapter10](#)

[Biology of *Macrobrachium rosenbergii*](#)

[Preparation of nursery and grow-out pond](#)

[Nursery pond management](#)

[Grow-out pond management](#)

Economics of grow-out production of prawn

[Eyestalk ablation](#)

[Protocol of rearing *M.rosenbergii* larvae](#)

[Brood stock collection and maturation](#)

[Incubation, hatching and fecundity](#)

[Larval rearing](#)

[Salinity, pH, Temperature, light,aeration, nutrition](#)

[Water quality management for](#)

[indoor nurseries](#)

[Stocking rates](#)

[Feeding strategy](#)

[Feed formulation](#)

[Feeding schedule](#)

[Dealing with problems of predation](#)

[Pond size](#)

[Eradication of predators](#)

[Application of Rotenone and Teaseed cake](#)

[Use of artificial substrate](#)

[11. Marine Prawn Fishery and Culture](#)

[Fishery](#)

[Penaeus indicus](#)

[P.monodon](#)

[P.merguensis](#)

[P.semisulcatus](#)

[Metapenaeus monoceros](#)

[M.dobsoni](#)

[M.affinis](#)

[M.brevicornis](#)

[Parapenaeopsis stylifera](#)

[P.sculptilis](#)

[P.hardwickii](#)

[Culture](#)

[Introduction](#)

Type of shrimp farming

[Traditional system](#)

[Extensive system](#)

[The semi intensive system](#)

[Intensive system](#)

[Natural beach filter for seawater](#)

[Construction of the filterprobe](#)

[Maintainingthe efficiency of the filter](#)

Simple plastic beach filter

[Farm-made larval diet No.](#)

[Stock estimation](#)

[Stock estimation when post larvae are harvested](#)

[Water quality management](#)

[Salinity, Temperature](#)

[Turbidity,Dissolved oxygen](#)

[pH, Alkalinity and hardness,Carbon dioxide](#)

[Ammonia, Hydrogen sulfide](#)

[Culture of Penaeuslatisulcatus](#)

Culture of Penaeus japonicas

Economics for extensive prawn farm (for the Tiger prawn)

Bank loan, interest and replacement schedule for intensive farming

Economics for semi-intensive prawn farm

[Culture of M.dobsoni](#)

Bank loan interest and replacement for semi-intensive farming

[Breeding](#)

[Net growth efficiency](#)

[Food consumption](#)

[Feeding](#)

[12. Shrimp Feed and itsManagement](#)

[Introduction](#)

[Typeof feeds](#)

[Feed tobe given at nauplier stage](#)

[Natural feed, Wet feed, Pellet feed](#)

[Extrusion feed preparationmethod](#)

[Advantages of pelletized feed](#)

[Pellet size](#)

[Calculation of feeding](#)

[Calculation of daily feed requirement](#)

[Assessing survival rate](#)

[Feed conversion ratio \(FCR\)](#)

[Feed efficiency \(FE\)](#)

[Use of antibiotic feed and withdrawal](#)

[Recommended withdrawal period and drug](#)

[Selection of good quality feed](#)

[Feed purchase and storage](#)

[Feed management](#)

[Feed composition](#)

[Percentage of nutrients and requirements](#)

[Protein, Animal protein, Vegetable protein](#)

[Lipid](#)

[Vitamin, Fibers](#)

[Feed formula No 1](#)

[Feed formula No 2](#)

[Feed formula No 3](#)

[Feed formula No 4](#)

[Feed formula No 5](#)

[Feed formula No 6](#)

[Feed formula No 7](#)

[Feed formula No 8](#)

[Feed formula No 9](#)

[13. Important Prawn Diseases and their Treatment](#)

[Infectious diseases](#)

[Non-infectious diseases](#)

[Taxonomical word used in disease](#)

[Infectious diseases](#)

[1. Black spot or brown spot or burnt spot disease](#)

[2. Browngill](#)

[3. Orangegill](#)

[4. Redgill](#)

[5. Blackgill, Prevention, Treatment](#)

[6. Milk or cotton disease Identification, Causing agents, Prevention, treatment](#)

[7. Cramped tail disease, Identification, Prevention](#)

[8. Chronic soft shelling, Identification, Causing agent, Prevention, Treatment](#)

[9. Blue disease, Identification, Causing agents, Prevention treatment](#)

[10. Ectocommusal fouling disease, Causing agents, Identification, Prevention, Treatment](#)

[11. Tail rot disease, Causing agents, Identification, Prevention, Treatment](#)

[12. Yellow head disease, Identification, Prevention, Treatment](#)

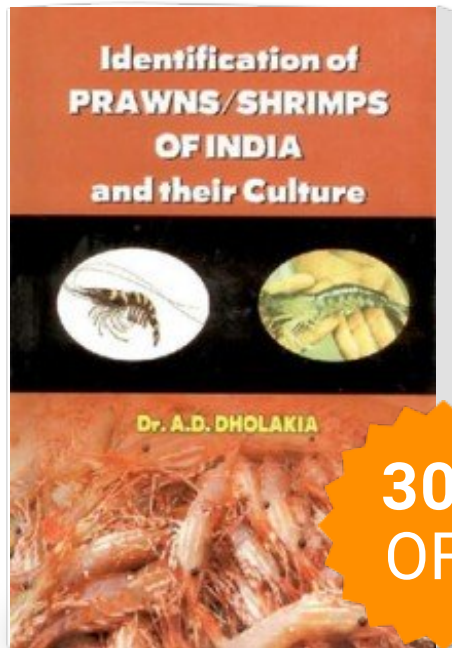
[13. Red disease, Identification, Causing agent, Prevention, Treatment](#)

[14. Crooked leg disease, Identification, Causing agents, Prevention, Treatment](#)

[15. Black splinter disease, Identification, Causing agents, Prevention, Treatment](#)

[16. Brown muscle syndrome, Identification, Prevention](#)

Identification of Prawns/shrimps And Their Culture By A.D. Dholakia



Publisher : Astral International
Pvt Ltd

ISBN : 9789383048571

Author : A.D. Dholakia

Type the URL : <http://www.kopykitab.com/product/3601>



Get this eBook