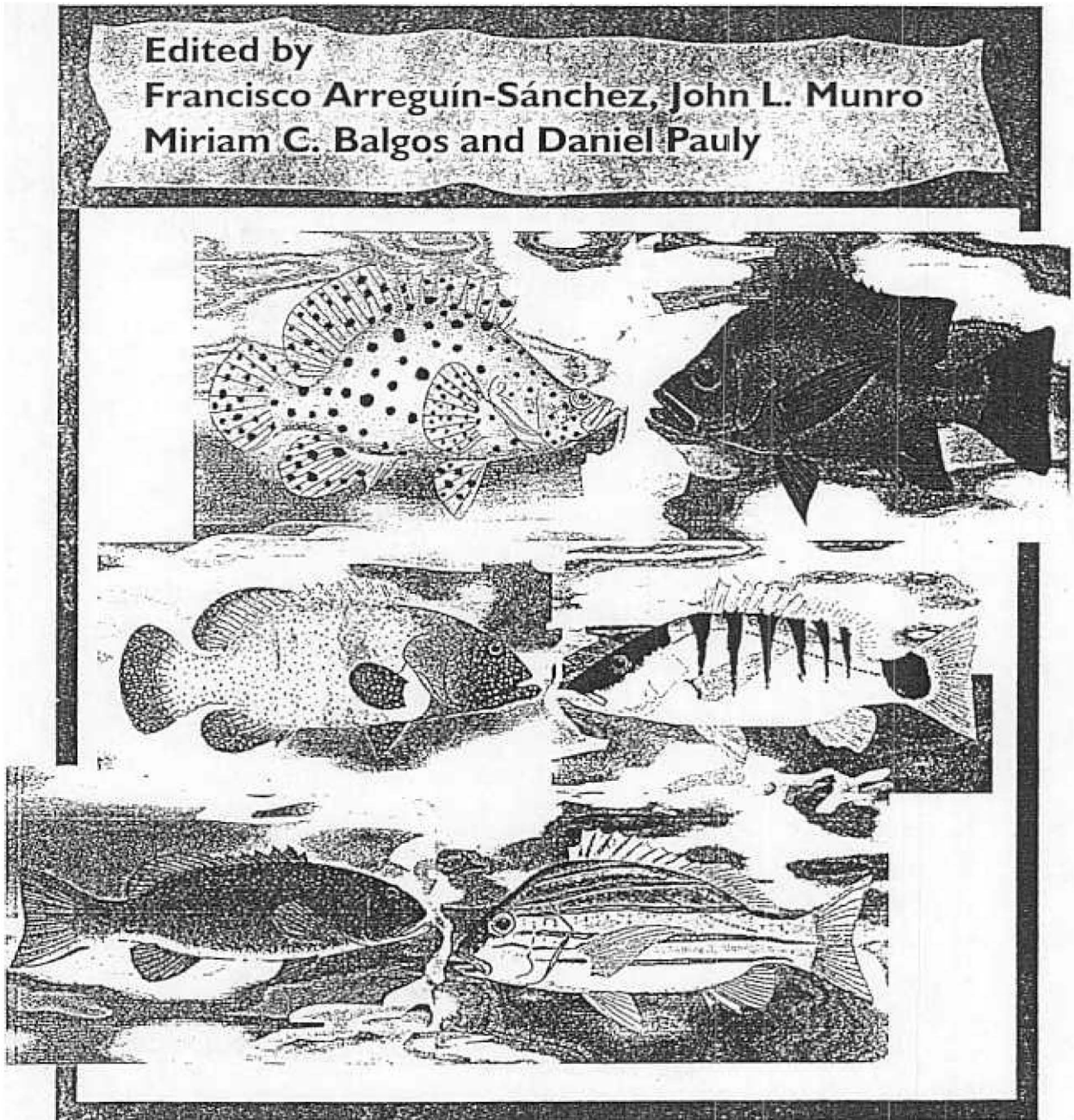


Biology, fisheries and culture of tropical groupers and snappers

Edited by
Francisco Arreguín-Sánchez, John L. Munro
Miriam C. Balgos and Daniel Pauly



International Center for Living Aquatic
Resources Management



Universidad Autónoma
de Campeche

Biology, fisheries and culture of tropical groupers and snappers

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CONTENTS

Foreword	• M.J. Williams	vi
Preface and Acknowledgements	• F. Arreguín-Sánchez, J.L. Munro, M.C. Balgos and D. Pauly	vii
Part I:	Workshop Conclusions	
	Biology, fisheries and culture of snappers and groupers: workshop conclusions and updates to 1996 • <i>D. Pauly, F. Arreguín-Sánchez, J.L. Munro and M.C. Balgos</i>	1
Part II:	Biology, Ecology and Distribution	
	Ecology and population dynamics of <i>Lutjanus synagris</i> on Campeche Bank • <i>E. Rivera-Arriaga, A.L. Lara-Domínguez, J. Ramos-Miranda, P. Sánchez-Gil and A. Yáñez-Arancibia</i>	11
	Trophic role of the red grouper (<i>Epinephelus morio</i>) in the ecosystem of the northern continental shelf of Yucatan, Mexico • <i>F. Arreguín-Sánchez and E. Valero</i>	19
	Biological research on the red grouper (<i>Epinephelus morio</i>) from the southern Gulf of Mexico • <i>T. Brulé and C. Déniel</i>	28
	Seasonal patterns of distribution and abundance of snappers in the Mexican Caribbean • <i>S. Díaz-Ruíz, A. Aguirre-León, C. Macuitl and O. Pérez</i>	43
	Biological aspects of the yellow eye snapper (<i>Lutjanus vivanus</i>) (Pisces: Lutjanidae) from Los Hermanos Islands, Eastern Venezuela • <i>G.J. Gómez, R.A. Guzmán and L.A. Marcano</i>	51
	Species composition, distribution and trends in abundance of snappers of the southeastern USA, based on fishery-independent sampling • <i>N. Cuellar, G.R. Sedberry, D.J. Machowski and M.R. Collins</i>	59
	The ecology of shallow-water groupers (Pisces: Serranidae) in the Upper Florida Keys, USA • <i>K.M. Sullivan and R. Sluka</i>	74
	A molecular approach to stock identification and recruitment patterns in red snapper (<i>Lutjanus campechanus</i>) • <i>R.W. Chapman, S.A. Bortone and C.M. Woodley</i>	85
	Large catches of red snappers by tuna purse seiners off the West African continental shelf • <i>A. Caverivière</i>	92
	Uncommon mortality of groupers at the end of the warm season in the coastal area of Sénégal (West Africa) • <i>A. Caverivière and D. Touré</i>	96
	Groupers and snappers of India: biology and exploitation • <i>P.S.B.R. James, V. Sriramachandra Murty and P. Nammalwar</i>	106
Part III:	Age, Growth and Reproduction in the Wild	
	Reproduction, age and growth of the Caribbean red snapper (<i>Lutjanus purpureus</i>) in waters off Trinidad and Tobago • <i>S.C. Manickchand-Heileman and D.A.T. Philipp</i>	137
	Validation of ageing technique for Nassau grouper (<i>Epinephelus striatus</i>) in the Cayman Islands • <i>P.G. Bush, G.C. Ebanks and E.D. Lane</i>	150
	Age validation, movements and growth rates of tagged gag (<i>Mycteroperca microlepis</i>), black sea bass (<i>Centropristis striata</i>) and red porgy (<i>Pagrus pagrus</i>) • <i>M.R. Collins, S.B. Van Sant and G.R. Sedberry</i>	158

The validity of length-based methods for estimating growth and mortality of groupers, as illustrated by comparative assessment of the Creole fish <i>Paranthias furcifer</i> (Pisces: Serranidae) • J.M. Posada and R.S. Appeldoorn	163
Spawning and annual fecundity of the red snapper (<i>Lutjanus campechanus</i>) from the northeastern Gulf of Mexico • L.A. Collins, A.G. Johnson and C.P. Keim	174
Reproductive biology of the gray snapper (<i>Lutjanus griseus</i>), with notes on spawning for other western Atlantic snappers (Lutjanidae) • M.L. Domeier, C. Koenig and F. Coleman	189
Population dynamics and stock assessment of red grouper (<i>Epinephelus morio</i>) fishery on Campeche Bank, México • F. Arreguín-Sánchez, M. Contreras, V. Moreno, R. Burgos and R. Valdés	202
FishBase and AUXIM as tools for comparing life-history patterns, growth and natural mortality of fish: applications to snappers and groupers • D. Pauly and C. Binohlan	218

Part IV: Fisheries Assessments

Effect of gas bladder deflation on mortality of hook-and-line caught and released red snappers: implications for management • J.H. Render and C.A. Wilson	244
Demersal fish stock assessment in Seychelles: an analysis of a mothership/catcher boat fishery • C.C. Mees	254
Abundance and distribution of snappers and groupers targeted by the artisanal medium range fishery off northeastern Venezuela (1981-1992) • J.J. Mendoza and A. Lárez	266
Trends in commercial fishery landings of groupers and snappers in Bermuda from 1975 to 1992 and associated fishery management issues • B.E. Luckhurst	277
Catch, effort and sustainable yield for Australia's northern trawl fishery • D.C. Ramm and Y. Xiao	289
Reproduction in gag (<i>Mycteroperca microlepis</i>) (Pisces: Serranidae) in the eastern Gulf of Mexico and the consequences of fishing spawning aggregations • C.C. Koenig, F.C. Coleman, L.A. Collins, Y. Sadovy and P.L. Colin	307
Assessment of a snapper complex (<i>Lutjanus</i> spp.) of the eastern tropical Pacific • M. Cruz-Romero, E.A. Chávez, E. Espino and A. García	324
Exploratory fishing with traps in oceanic islands off eastern Venezuela during 1992 • L.A. Marcano, R. Guzmán and G.J. Gómez	331
Impact of variability in numbers and size at first recruitment on the $F_{0.1}$ reference point in the US red snapper fisheries of the Gulf of Mexico • N.M. Ehrhardt and C.M. Legault	337
Analyses of catch-per-effort data for red snapper on Campeche Bank in 1992 • M. Del Carmen Monroy-García, R. Burgos Rosas, M.E. González y De la Rosa and M. Garduño-Andrade	350
Time series analysis and multivariate methods applied to the red grouper fishery on Campeche Bank, Mexico • J. Pol and S. Moreno	355
Shrimp trawl bycatch research in the US Gulf of Mexico and southeastern Atlantic • E. Scott-Denton and J. Nance	360

Part V: Aquaculture and Controlled Reproduction	
Nassau grouper aquaculture • <i>J.W. Tucker, Jr. and P.N. Woodward</i>	363
Maturation and induced spawning of the mangrove red snapper (<i>Lutjanus argentimaculatus</i>) reared in a floating net cage in the Philippines	
• <i>A.C. Emata</i>	378
Ultrastructural study of lymphocystis in kelp bass (<i>Epinephelus moara</i> ; Serranidae)	
• <i>Z. Yongjia, W. Zeyang and C. Kangrong</i>	385
Development from egg to juvenile of the red grouper (<i>Epinephelus morio</i>) (Pisces: Serranidae) in the laboratory • <i>P.L. Colin, C.C. Koenig and</i> <i>W.A. Laroche</i>	399
Appendices	
1. List of Participants.....	415
2. Author Index	420
3. Geographic Index	434
4. Species Index	441

FOREWORD

This volume of papers from the 1993 workshop on snappers and groupers presents important scientific findings and views on two important groups of fish.

Groupers, in the family Serranidae, and snappers, in the family Lutjanidae, are amongst the most valuable components of catches in tropical and subtropical seas. The families are diverse but all species are highly valued as food fish and are actively sought by fishers wherever they are found. They are vulnerable to a wide range of fishing gears. Not only can they be caught in various nets but, being predators, they will also take baited hooks and enter baited traps. Many species are large, curious and unwary and easy prey for spearfishers. Many, particularly groupers, form spawning aggregations at clearly established times and places, where the aggregations can be relentlessly exploited. The unfortunate consequence of all this is that many stocks are overfished and, in some cases, threatened with extinction on a local scale.

Groupers are also protogynous hermaphrodites. This means that they first mature as females and later, at a large size, change into males. Such a life history raises the very real possibility that heavily exploited stocks, in which the average size has been drastically reduced, will suffer an acute shortage of males at spawning times, resulting in unfertilized eggs and, carried to an extreme, the collapse and extinction of the stock. In the past few years, since this conference was held, an additional threat has emerged in the form of great demand for live groupers in Southeast Asia, and at premium prices. This has prompted even greater onslaughts on the stocks in the Indo-Pacific Region.

All these features of the snappers and groupers alone justify the investment of considerable time and expense in research on the assessment and management of snappers and groupers and, in more recent years, on their artificial propagation for cultivation in cages or ponds, or for stock enhancement. The papers presented in this volume are evidence of the importance attached to these species by governments and research institutions and, ultimately, by the fishing communities who depend on the well-being of the stocks. They also attest to the advances in knowledge which have emerged in recent years through the support of well-planned research. However, they also show that the quest for knowledge is not over and that further effort is needed if these most vulnerable species are to be rationally managed and sustainably exploited.

Meryl J. Williams
Director General
ICLARM

PREFACE AND ACKNOWLEDGEMENTS

Groupers and snappers are important fishery resources of the tropics and subtropics, where their high values have caused most of their stocks to be heavily exploited, some even to the point of collapse. Trends towards heavy demand and decreasing natural supply, which are accelerating in several parts of the world, prompted various mariculture ventures — but these have not yet generated sufficient supply to satisfy the soaring demand, especially for live fish.

Focused research on the biology and the population dynamics of groupers and snappers, and on their reproduction and growth under controlled condition — while no panacea — will remain essential for dealing with the questions on how to better manage their fisheries, and to farm them, and workshops where such research can be presented and evaluated are crucial if progress is to be made.

To date, three international workshops have been devoted to groupers and snappers:

- 1) one held in October 1975, in Pensacola Beach, Florida and documented in Bullis, H.R. and A.C. Jones (1976) *Proceedings: colloquium on snapper-grouper fishery resources of the Western Central Atlantic Ocean*. Florida Sea Grant College Program, University of Florida, Gainesville, 337 p.;
- 2) another held in May 1985, in Honolulu and documented in Polovina, J.J. and S. Ralston. 1987. *Tropical snappers and groupers: biology and fisheries management*. Westview Press, Boulder, Colorado, 659 p.; and
- 3) a third, which led to this document, held in October 1993 in Campeche, Mexico, jointly organized by EPOMEX (Programa de Ecología, Pesquerías y Oceanografía del Golfo de México) and ICLARM (International Center for Living Aquatic Resources Management).

This latest workshop resulted from a meeting in May 1992 of two of us (Francisco Arreguín-Sánchez and Daniel Pauly) at the First World Fisheries Congress.

The workshop proper was prepared by an organizing committee headed by Francisco Arreguín-Sánchez who, jointly with John Munro, also chaired the workshop sessions.

The objectives of the workshop were to:

- 1) assess the status of knowledge about groupers and snappers as tropical fishing resources;
- 2) identify the gaps in knowledge; and
- 3) promote worldwide scientific collaboration.

The workshop's strategy and linkages were:

Experts were invited to attend the workshop. They were all chosen as recognized scientists in their fields and balanced representation was sought from most of the tropical regions of the world: i.e., the South Pacific, Gulf of Thailand, Southeast Asia, Western Coast of Africa, Northeastern Coast of Australia, Caribbean Sea, and the Gulf of Mexico. Participants came with prepared manuscripts. Theme sessions were integrated through working groups. This initiative was under the framework of the Program of Ocean Science and Living Resources (OSLR), specifically the Tropical Demersal Recruitment Project (TRODERP) and the Subproject Coral Reef Demersal Recruitment Project (CORDERP) in the Caribbean and Adjacent Regions (IOCARIBE, IOC/FAO).

Altogether 60 scientists met on 26-29 October 1993 in Campeche, Mexico and presented papers, most of which are included here, along with a few contributions sent in later by authors who were not able to attend.

We thank these colleagues for their patience in waiting for the proceedings. And we are aware that the "update to 1996" tagged onto the workshop conclusions will not fully compensate for the anguish of some authors who feared that their paper would *never* come out.

It is our pleasure to conclude this by acknowledging those who made this workshop possible:

First our thanks go to the staff of EPOMEX who, under the dynamic leadership of Dr. A. Yañez-Arancibia, organized and hosted this workshop and its cultural program, including much appreciated visits to a Mayan temple, some fishing villages and several restaurants that proved Mexican food to be not "hot", but *savory*.

We also acknowledge the crucial support provided by the Government of Campeche State, and several of its agencies: Secretaría Particular del Gobierno del Estado de Campeche; Secretaría de Educación, Cultura y Deporte; Secretaría de Desarrollo Pesquero; Secretaría de Desarrollo Económico; Secretaría de Turismo. We also thank the (Federal) Secretaría de Educación Pública, through the Subsecretaría de Educación Superior e Investigación Científica/Sep-Fomes; and the Instituto Nacional de la Pesca, Mexico for their input and collaboration.

The Editors