

The Corals Of The Mediterranean Oceana

What do we know about Mediterranean Cold (Deep)-Water coral ecosystems? In this book, specialists offer answers and insights with a series of chapters and short papers about the paleoecology, biology, physiology and ecology of the corals and other organisms that comprise these ecosystems. Structured on a temporal axis—Past, Present and Future—the reviews and selected study cases cover the cold and deep coral habitats known to date in the Mediterranean Basin. This book illustrates and explains the deep Mediterranean coral habitats that might have originated similar thriving ecosystems in today’s Atlantic Ocean.

Drawing on diverse perspectives, this collection of 12 essays and around 150 colour illustrations explores the history and mysteries of the “Coral Road” from the Mediterranean to Japan. From Italy, with its ancient traditions of deep-sea coral fishery, production and trade, the reader is transported to Tibet and India, where coral has long been revered as a Buddhist treasure and amulet. The focus then moves to Japan, with the book highlighting the vivid red coral “tree” of folklore and festivals and the lavish use of the exotic gemstone in the magnificent accessories and craftwork of the Edo Period (1603-1868), before tracing the history of Japanese coral fishery, trade and production in modern times. Inspired by an urgently perceived need to preserve the legacy of precious coral for future generations, this retrospective, yet forward-looking, book will appeal to a wide readership, from marine ecologists to economic, social, cultural and religious historians, as well as scholars of fashion and design.

This volume is an indispensable addition to the multidisciplinary coverage of the science of the Mediterranean Sea. The editors have gathered leading authorities from the fields of Marine Biology, Ecology, paleoclimatology, Chemical and Physical Oceanography, Zoology, Botany, Aquatic Photosynthesis, Socioeconomics, Mariculture, Mediterranean History and Science of Humanity. Beginning with the birth of the Mediterranean Sea and its myths. From coral to fish, an introduction is given to its major inhabitants of plants and animals past and present. The chapters illustrate how organisms interact as part of the structure and function of the Sea’s main ecosystems. The rise of the Mediterranean as the cradle of the Western Civilization leads to a discourse on the status of human interaction with the sea. Accelerating global climate change, water warming, ocean acidification and sea level rise, and analyses of their effects on key organisms, entire ecosystems and human socioeconomics are given. Forecasting and predictions are presented taking into account different future scenarios from the IPCC (International Panel on Climate Change). The volume is richly illustrated in color, with an extensive bibliography. A valuable addition to the limited literature in the field, offering up-to-date broad coverage merging science and humanities.

Transcriptional Response of the Heat Shock Gene Hsp70 Aligns with Differences in Stress Susceptibility of Shallow-water Corals from the Mediterranean Sea

Life in the Mediterranean Sea

Baited Photo-lander Studies of the Deep Sea Mobile Fauna of Inaccessible Habitats

Corals in a Changing World

Global Report on the Biology, Fishery and Trade of Precious Corals

An Annual Review

The definitive field guide to all the sharks, rays and chimaeras of the European Atlantic and Mediterranean The waters of the northeast Atlantic and Mediterranean Sea are home to an amazing variety of sharks, rays and chimaeras. This comprehensive and easy-to-use field guide covers all 146 species found in the Mediterranean, the waters of the European Atlantic and Iceland, along all the Scandinavian coasts, in the Black Sea and as far south as the Canary Islands. Detailed species accounts describe key identification features, habitat, biology and status. Every species account comes with a colour distribution map, a depth guide, at-a-glance icons and colour illustrations. This must-have field guide also features illustrated key guides that enable you to accurately identify down to species, comparison plates of similar species, illustrations of eggcases where known and plates of teeth. The first field guide to cover all 146 species Features hundreds of colour illustrations, photos, maps and diagrams Describes key features, habitat, biology and status Includes depth guides, at-a-glance icons, key guides and teeth plates

Highly illustrated synthesis of research on cold-water corals worldwide.

For millennia corals were a marine enigma confounding classification and occupying a space between the animal and vegetable kingdoms. Ultimately their animal and symbiotic natures were recognized, and they remain the focus of intense fascination and research. The danger to seafarers posed by unseen underwater coral reefs led to their association with death and interment that has figured in literature, poetry, music and film. The bright redness of precious Mediterranean coral was associated with blood, including coral's gory origin in European and Indian mythology, and its place in religion. Corals have long been prized as jewellery and ornament, and were a feature of many Kunstkammer collections during the Renaissance. Seen as "rainforests of the sea", coral reefs have become greenly emblematic of fragile marine biodiversity, warning of human-driven global climate change. This book uniquely treats the many manifestations of corals in biology and geology; how diverse corals came to figure in art, expeditionary accounts, medicine, folklore, geopolitics, and international trade; and corals as builders of islands and protectors of coastlines, and as building materials themselves. Exceptionally illustrated with a wide range of natural history images, underwater photographs and fine art, this book provides a unique resource for all interested in ocean environments and the cultures that have flourished there.

2nd Technical consultation : Papers

Sea Fishes Of The Mediterranean Including Marine Invertebrates

Advances in Marine Biology

Mediterranean Cold-Water Corals: Past, Present and Future

The Impact of Ocean Acidification on Respiration Rates of Mediterranean Cold-water Corals

Oceanography and Marine Biology

Sea Fishes of the Mediterranean reveals the fascinating wealth of sea life found in this diverse but little-documented region. This compact and easy-to-use guide, illustrated with many specially-commissioned colour photographs taken in a number of unique and exotic locations, is an essential companion for anyone interested in the marine life of the many seas that make up the Mediterranean Sea. Designed to be of practical use to divers, snorkelers and underwater photographers, this guide will be welcomed by the increasing number of visitors to the Medierranean, which has become one of the most popular dive destinations in the world. It covers Gibraltar, Spain, France, Monaco, Corsica, Sardinia, Italy, Malta, Croatia, Greece, Crete, Cyprus, Turkey, Syria, Lebanon, Israel, Egypt, Libya, Tunisia, Algeria and Morocco.

This book is an unpretentious editing venture to fill the gap in our current knowledge on the ecological implications caused by anthropogenic disturbances upon benthic communities in several regions of the world, including the Western Atlantic, the Mediterranean Sea, and the Eastern Pacific Ocean, as well as the pristine environments of the Andes in South America. The common goal of the contributing authors in this book was to unravel the complex processes that make possible the life existence of bottom-living animals in different environmental scenarios. To achieve such a goal, the authors focus their attention on the emerging issues inherent to global climate change or the pollution of aquatic systems. These are all themes that might be of interest to scientists active in a wide range of oceanographic subdisciplines. Well-established researchers would appreciate the innovative approach adopted in each chapter of the book, which extends from the ecosystem level to refined molecular interpretations.

This thesis explores the physiology of two symbiotic Mediterranean corals, *Cladocora caespitosa* and *Oculina patagonica* to changes in their environmental parameters. The effect of temperature was investigated both under the normal seasonal range as well as in the perspective of climate change on the two coral species. The effects of irradiance, food supply, and pCO2 level were only investigated with *C. caespitosa* taken as a model. Temperature was one of the main environmental factors affecting corals' metabolism. Increased concentrations of zooxanthellae and chlorophyll were observed at low temperatures and high food supply, allowing an increase in the photosynthetic efficiency during unfavorable conditions. Conversely, photosynthetic and growth rates were maximal under summer conditions, at temperatures ranging from 18 to 23°C. Higher temperatures (from 24 to 28°C) negatively affected the photosynthesis, growth and symbiosis in both corals. While *C. caespitosa* resisted 5 weeks at temperatures equal or above 24°C before decreasing its metabolic functions and dying, *O. patagonica* reduced its symbiont density and growth rates as soon as temperature increased, but showed a low mortality rate. These results, together with the observations of mass mortalities of *C. caespitosa* during the last summers suggest that this coral is living near its upper thermal limits. We also demonstrated, using *C. caespitosa*, that food supply was the second most important parameter for these two temperate corals. Conversely, a 8-fold increase in the light level did not change zooxanthellae and chlorophyll concentrations, or growth rates, suggesting that this factor is not important for the coral metabolism. Finally, a doubling in the pCO2 level, as expected by the end of the century, did not either affect *C. caespitosa* metabolism, leading temperature as the most important parameter.

Mediterranean submarine canyons: ecology and governance

Field Guide to Sharks, Rays & Chimaeras of Europe and the Mediterranean

Diseases of Coral

Red Coral Resources of the Western Mediterranean and Their Rational Exploitation

Lessons from the Mediterranean

Responses of Two Mediterranean Corals, *Cladocora Caespitosa* and *Oculina Patagonica* to Environmental and Climate Change

Autonomous photographic landers allow the assessment of mobile fauna where methods such as trawling are not feasible or ethical. This thesis focuses on two projects in which standard methods would not have been appropriate: at cold- water coral reefs throughout Europe and the deep eastern Mediterranean Sea. The Biogenic Reef Ichtheyofauna Lander (BRIL) was initially constructed as a impact survey method for the CoralFISH project. The aim of CoralFISH is to assess the interaction between cold-water corals and sh in four regions within Europe: Region 1: Northern Norway Eastern Norwegian Sea, Region 3: Porcupine Seabight/Rockall Trough, Region 4: Bay of Biscay, Region 6: Mediterranean: Ionian Sea. Twenty deployments were possible during the project and at all four of the regions studied: the fish arrived more quickly and reached higher peak numbers at the coral stations than the reference stations, indicating that fish abundance is higher within the coral areas. Fish species diversity was higher within coral areas of temperate regions while in the more extreme environments of the Arctic circle and Mediterranean, coral areas a single dominant species reached very high numbers. In the Mediterranean Sea the BRIL was used to investigate the fauna of the Hel-lenic trench from 557m down to the 5,111m depth - the Mediterranean's deepest point. A decrease with depth in species richness, the abundance of animals and the size of fish was noted until only two species remained beyond 3396m. *Coryphaenoides mediterraneus* (Mediterranean grenadier) and *Acanthephyra eximia* (Deep-water shrimp). This work extended the known range of *C. mediterraneus* and confirmed that, despite extreme oligotrophy, life is present at the deepest point in the Mediterranean Sea.

Advances in Marine Biology, Volume 79, the latest release in a series that has been providing in-depth and up-to-date reviews on all aspects of marine biology since 1963, updates on many topics that will appeal to postgraduates and researchers in marine biology, fisheries science, ecology, zoology and biological oceanography. This latest release includes a review of patterns of multiple paternity across sea turtle rookeries, parasites and pathogens in seabirds, progress in marine genomics and bioinformatics, the rise of sea turtle research and conservation, and the potential impacts of offshore oil and gas activities on deep-sea sponges and the habitats they form. Reviews articles on the latest advances in marine biology Authored by leading figures in their respective fields of study Pres

This book explores the ethnobiology of corals by examining the various ways in which humans, past and present, have exploited and taken care of coral and coralline habitats. This book will bring the educated general audience closer to corals by exploring the various circumstances of human-coral coexistence by providing scientifically sound and jargon-free perspectives and experiences from across the globe. Corals are a vital part of the marine environment since they promote and sustain marine and global biodiversity while providing numerous other environmental and cultural services. Countless valuable coral conservation efforts are published in academic and general audience venues on a daily basis. However relevant, few of these reports show a direct, deeper understanding of the intimate relationship between people and corals throughout the world's societies. Ethnobiology of Corals and Coral Reefs establishes an intimate bond between the audience and the wonder of corals and their importance to humankind.

Understanding the Deep-Sea Realms of Coral

Advances in the Studies of the Benthic Zone

Ecology and Conservation of the Mediterranean Endemic Coral *Cladocora Caespitosa*

European Cold-water Coral Reefs and the Deep Mediterranean Sea

Their Ecology and Conservation

The Impact of Ocean Acidification on Calcification of Mediterranean Cold-water Corals

Coral disease is quickly becoming a crisis to the health and management of the world's coral reefs. There is a great interest from many in preserving coral reefs. Unfortunately, the field of epizootiology is disorganized and lacks a standard vocabulary, methods, and diagnostic techniques, and tropical marine scientists are poorly trained in wildlife pathology, veterinary medicine, and epidemiology. Diseases of Coral will help to rectify this situation.

Excerpt from Letters From the South, Vol. 2 of 2 French African Company - Coral - Ancient opinions respecting it - Natural History of Coral - Period of the Coral Fishery in the Mediterranean - Mode of fishing it up - Remarks of Spallanzani - Sicilian Coral Fishers - History of the French Coral F ishery - Estimated revenue that might be derived from its cultivation Supply from the Red Sea - Coral much esteemed among the Orientals - Formation of Coral Reefs Remarkable properties of the Coral Insect. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Cold-water coral ecosystems figure the formation of large seabed structures such as reefs and giant carbonate mounds; they represent unexplored paleo-environmental archives of earth history. Like their tropical cousins, cold-water coral ecosystems harbour rich species diversity. For this volume, key institutions in cold-water coral research have contributed 62 state-of-the-art articles on topics from geology and oceanography to biology and conservation, with some impressive underwater images.

The Biology and Geology of Deep-Sea Coral Habitats

Precious Coral and the Legacy of the Coral Road

Cold-Water Corals

Annual Report and Transactions

Ecological Restoration of Cold-water Corals on the Mediterranean Continental Shelf

Coral Reefs of the Indian Ocean

Recent studies, carried out by means of innovative technological tools as remotely operated vehicles (ROVs), have highlighted the richness of the Mediterranean deep-sea environments, characterized by great diversity and abundance of organisms. In particular, corals, gorgonians, and sponges play the important ecological role of ecosystem engineers in deep marine environments, creating complex three-dimensional habitats enhancing high biodiversity and ecosystem functioning at every level. Coral forests and bathyal white coral communities, starting from depths of 50-70 m and below 300 m, respectively, represent the richest ecosystems known so far for the Mediterranean basin. The different assemblages show a strong heterogeneity, varying in terms of specific composition, abundance, size of colonies, and associated fauna, even on a small spatial scale. Unfortunately, the high commercial fishing effort of trawling and longline fleets mainly operating along this bathymetric range represents a major threat for these vulnerable marine ecosystems, particularly in consideration of their structuring organisms which are long-lived species with slow growth rates and recovery ability. Further knowledge on deep coral assemblages is urgently needed to implement effective management and proper conservation measures. This approach is now an international priority that proceeds together with the inclusion of the structuring species in numerous directives. Corals comprise a wide variety of colonial marine invertebrates belonging to the Phylum Cnidaria. Their polyps form the most colorful, complete, and diverse communities on the Earth resembling underwater cities, commonly called coral reefs, which host a wide variety of invertebrates and fish species. They are highly productive ecosystems, contribute to the health of the biosphere, and offer a good number of economic and ecological services to coastal populations and to many people around the world. However, due to a diverse number of natural and anthropogenic stressors, corals have shown a severe decline over the past few decades. Being aware of the importance and relevance of the facts described, the book "Corals in a Changing World" offers new scientific information regarding the actual status and, in some cases, the resilience state of coral reef systems. Timely information is critical for managers and decision makers to implement sustainable management measures according to the ecological condition of coral reefs. In addition, the book also discusses the use of well-maintained coral microcosms to provide a good basis for performing experiments with natural fluctuations and to present studies dedicated to the coral diversity characterization and to their importance as a source of important biological compounds, which could be converted into industrial products.

The Mediterranean Sea is considered the most threatened sea on Earth. This new book presents a scientific look at the past, present and future changes occurring in the Mediterranean Sea. In addition, this book also gives a background description of the geology, physical oceanography, marine chemistry and marine biology of the Mediterranean Sea. It provides an up-to-date summary of the human (anthropogenic) factors affecting the Mediterranean marine environment, as well as an estimate of the future of the Mediterranean Sea as related to local and global changes, with an emphasis on climate change.

THE SCLERACTINIAN CORALS OF THE MEDITERRANEAN AND THE NORTHEASTERN ATLANTIC

Letters from the South, Vol. 2 of 2 (Classic Reprint)

Red coral of the Mediterranean

Extreme Diving and the Plunder of Red Coral in the Mediterranean

Ethnobiology of Corals and Coral Reefs

This document has been prepared by the Food and Agriculture Organization of the United Nations (FAO), in accordance with a request from CITES (CoP Decision 17.191 on Precious corals, for consideration at the 30th meeting of the Animals Committee). The report concerns precious (red, pink, white and black) coral species within the hexacoral order Antipatharia, and the octocoral family Coralliidae. According to the requirements of CITES Decision 17.191, the study considers all available data and information on the biology, population status, use and trade in each species, including the identification of gaps in such data and information. It contains information on the management and harvest regulation schemes for these coral species, with the aim of considering the effectiveness of their management and conservation. The report intends to inform the CITES parties of the status of the management and trade of precious corals, in order to provide guidance on the actions needed to enhance the conservation and sustainable use of precious corals.

Accessible and complex, coral reefs are ideal natural laboratories for studying a wide range of ecological and biological questions. This collection focuses on the Indian Ocean and the Red Sea, which contain some of the most spectacular reefs found anywhere and which are relatively little studied. It will appeal to a broad range of researchers in ecology and will be an essential resource for anyone studying reefs.

For Captain Leonardo Fusco the discovery of the sea started at the age of nine. Years later while snorkeling off the coast of Palinuro, he discovered a branch of *Corallium Rubrum* (red coral) that for centuries has been widely traded and highly valued in the jewelry industry. As a result of this discovery, he started to search for coral and soon he became the first corallaro. The intention of the author in writing this book is to make the nations of the world aware of this sad reality and to promote a universal consensus for the protection of Red and Pink Coral (*Corallium Rubrum*) and for making trade of all coral illegal.A portion of the proceeds from this book will go to www.Reef.org

Precious Corals

A Look at Habitat Changes

Cold-Water Corals and Ecosystems

A Natural and Cultural History

Growth of Three Species of Mediterranean Cold-water Corals Exposed to Ocean Acidification

Effects of Ocean Acidification in Mediterranean Coral

"The workshop was the result of deliberations on a 2007 proposal by the United States to list red and pink corals in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES member nations did not adopt the U.S. proposal in 2007. While the international community recognized the conservation needs of these species, questions were raised about species distribution and biology, domestic management practices, product identification, and other issues related to implementation of a CITES Appendix-II listing. The United States held a workshop in Hong Kong in March 2009 to address these issues, with an emphasis on Pacific species. The Naples workshop focused on the Mediterranean red coral, *Corallium rubrum*"--Executive summary.

The Corals of the MediterraneanMediterranean Cold-Water Corals: Past, Present and FutureUnderstanding the Deep-Sea Realms of CoralSpringer

Marine ecosystems are declining worldwide threatened by an increasing number of stressors. Global change-related disturbances have highlighted the need of new complementary conservation measures; for which the knowledge on the affected species, communities and impacts is essential. The species objective of this PhD, the Mediterranean endemic coral *Cladocora caespitosa*, may serve as a case study of those species that even if seriously threatened, are lacking essential information on key ecological processes and the responses to the rapid environmental changes that are happening globally. *Cladocora caespitosa* is the only colonial and zooxanthellate scleractinian coral endemic to the Mediterranean Sea. It is a long-lived and ecosystem engineer species, being one of the rare examples of this type of organisms found in shallow Mediterranean communities, and constitutes an invaluable natural patrimony due to its extensive ancient history, its sizeable long-lasting structures and its fragility in the actual context of climate change. Currently, large *C. caespitosa* bioconstructions are scarce and only a few examples are known, i.e., in Mjlet National Park (Adriatic) or in the Columbretes Islands (NW Mediterranean). The extensive field of colonies and reefs found in the Illa Grossa Bay (Columbretes Islands Marine Reserve) shows a cumulative colony cover of 2900 m2. This population displays a high degree of geographical isolation and its spatial distribution in the bay is highly aggregated. Our results showed that *Cladocora caespitosa* is a slow growing species (\approx 2.5 mm yr-1), with low recruitment and natural mortality rates (\approx 0.30 recruits m-2 yr-1 and 1 %, respectively). Strikingly, the obtained results on the reproductive traits of this species differed significantly between Western Mediterranean and Adriatic Seas. *Cladocora caespitosa* is gonochoric in W Mediterranean, showing a water temperature-associated gonadal cycle that culminates at the end of the summer in contrast to the findings in the Adriatic, where the coral has described as hermaphroditic with the spawning occurring at the beginning of the summer. Global change is rapidly altering Mediterranean marine habitats, primarily through warming and the invasion of new species. The *C. caespitosa* population in the Illa Grossa Bay suffered mortalities after 9 summers, separated into 2 mortality periods (2003 - 2006 and 2008 - 2012). The highest necrosis rates were recorded during the first mortality period, after the exceptionally hot summer of 2003. Over 50 % of the area covered by *C. caespitosa* has suffered necrosis after these recurrent mortalities, which were significantly related to warming (summer warming trend: 0.06 °C yr-1). The differences in necrosis found after summers with similar thermal anomalies pointed out to the existence of other acting factors probably related to the interannual temperature context and delayed stress after extreme summers. These results show that while *Cladocora caespitosa* displays great ecological plasticity, mostly in relation to changing light conditions, it is not adapted to endure the extreme changes in temperature driven by climate change, the most worrying threat for this coral. Regarding to the impact of invasive species, the invasive algae *Lophocladia lallemandii* and *Caulerpa racemosa* successfully spread over the Illa Grossa Bay from 2006 to 2012 and overlapped their distribution in the bay with that of *C. caespitosa*. No lethal effects of the invasive algae were detected on the coral colonies, which showed toxic activity. This may explain the low overgrowth of living colony parts by *C. racemosa* and the ability of this coral to compete in an algal dominated community. In long-lived corals such as *C. caespitosa*, recovery from mortalities relies mostly on recruitment, but there are two main obstacles that may compromise recovery. Firstly, the high frequency of mortalities detected during the last decade probably exceed the recovery potential of the low recruitment rates. Secondly, both warming and invasive algae may have delayed and synergetic effects on reproduction, recruitment and juvenile survival. All the results obtained highlight the endangerment of this species facing rapid environmental changes. *Cladocora caespitosa* is listed in the IUCN Red List of Threatened Species as Data Deficient. However, the information obtained in this PhD points out that this species could meet the criteria to fall into a threatened category.

Its history and present challenges

The Corals of the Mediterranean

Where Corals Lie

The Mediterranean Sea

Red Gold

The Development of Cold-water Coral Ecosystems in the Mediterranean Sea

Description

Technical Consultation : Report

550,000 Years of Marine Climate Variability in the Western Mediterranean Sea Revealed by Cold-water Corals

Deep Gorgonians and Corals of the Mediterranean Sea

Proceedings of the International Workshop on Red Coral Science, Management, and Trade

An Introduction to the Study of Recent Corals