Preface

Mutsunori Tokeshi · Helen T. Yap

Published online: 29 April 2014
© Springer International Publishing Switzerland 2014

This Special Volume is based on the international symposium “Biodiversity in Changing Coastal Waters of Tropical and Subtropical Asia” held in Reihoku-Amakusa, Japan, during 30 November–3 December 2012. The symposium was intended as a focal point of discussion and information exchange among researchers working in tropical and subtropical Asia, covering both basic and applied issues of biodiversity assessment and conservation. The venue was in the Amakusa-Shimoshima Island on the west coast of Kyushu, which is located on the subtropical-temperate boundary and experiences the influences of the warm Kuroshio current that characterises much of the marine environments of low to mid-latitude western Pacific. As the coasts of this island effectively represent the northern limit of the occurrence of coral-associated assemblages in East Asia, the venue was considered most opportune, especially in relation to possible marine faunal/floral changes associated

with global climatic changes and increasing anthropogenic influences in the region.

The Indo-Pacific region encompassing the coastal waters of South-East Asia has long been known as the centre of marine biodiversity with exceptionally high levels of species richness and endemism. In particular, tropical waters of the Indo-Malay archipelagos are widely recognised as the veritable storehouse of marine biodiversity. This includes the area known as the coral triangle, straddling the Philippine islands, Borneo and Papua New Guinea. The biological significance of tropical Indo-Pacific is easily demonstrated by the fact that, compared with the tropical western Atlantic, the Caribbean, nearly 10 times as many species of corals (i.e. ~700 spp.) and 3–4 times of reef-associated fishes (~2,500 spp.), is known from this region. The significance of this high biodiversity is mirrored, for example, by the diversity of fish species harvested and marketed locally in the region (Tokeshi et al., 2013).

Notwithstanding such broadly recognised biological importance and some notable efforts on the part of individual scientists and institutions in the region, there is still a dearth of basic information on biodiversity due mainly to the lack of research infrastructure in many of the countries of Asia. This is exacerbated by ever-increasing paces of environmental degradation resulting from socio-economic pressures and climate change. Increased frequencies and scales of natural/man-made disturbances, as exemplified recently by Typhoon Haiyan that devastated the central Philippines in

Guest editors: M. Tokeshi & H. T. Yap / Biodiversity in Changing Coastal Waters of Tropical and Subtropical Asia

M. Tokeshi (✉)
Amakusa Marine Biological Laboratory, Kyushu
University, Reihoku-Amakusa, Kumamoto, Japan
e-mail: tokeshi@ambl-ku.jp

H. T. Yap
The Marine Science Institute, University of the
Philippines, Diliman, Quezon City, Philippines

November 2013, have become a real threat to long-existing ecosystems of tropical/subtropical waters of Asia. Faced with these situations, there apparently remain gaping ‘gaps’ in the distribution of field-oriented research effort, despite multi-level involvement of various organisations and researchers. Recognising this, one of the objectives of the symposium was therefore to encourage students and aspiring researchers in the region to engage in scientific research on coastal marine biodiversity, through dissemination of their research results and information exchange.

High biodiversity of coastal ecosystems of tropical/subtropical Asia presents more challenges to researchers in terms of taxonomic work and ecological data analysis. Apart from hermatypic corals and fishes, many marine groups are still inadequately described taxonomically, and many species are yet to be found and formally put on record. Even among supposedly well-known taxa such as fish, taxonomic coverage of some groups, e.g. Gobiidae, is far from satisfactory. Recent developments in molecular taxonomic techniques will surely help, but the scale of the remaining task is so enormous, considering a wide array of marine habitats and taxa, both animals and plants, including many of microscopic sizes. Further, data collection and analysis of species-rich coastal ecosystems of Asia require extra care, as uncertainties associated with numerical measures of ecological importance are added. One good example is the estimation of the total number of species in a particular area, a very basic measure of an ecological community (Tokeshi, 1999). Unless it is possible to sample/count all existing individuals in an area, it is generally necessary to make an estimation of total species number. This, however, is not a straightforward business in species-rich systems, as it may not be appropriate to assume an asymptotic relationship between sample size and species richness, an approach generally adopted in previous studies on species-rich assemblages (Tokeshi & Arakaki, 2007). Thus, researchers need to be aware of extra uncertainties associated with community measures derived from these systems.

The Symposium featured a total of 84 presentations covering diverse topics including taxonomy, ecology, biogeography, physiology, and methodological/management issues, all focusing on organisms and ecosystems of the Indo-Pacific. Taxonomically, scleractinian (hard) and non-scleractinian (soft) corals

were strongly represented with over 30% of the papers dealing with diverse aspects of coral biology and conservation, while an equally high proportion of papers were concerned with non-coral invertebrates. Other taxa were also covered, e.g. algae (12%), fishes (11%), higher plants (seagrasses, mangroves and other coastal plants, 10%), bacteria (6%), while 13% of the papers dealt with coastal marine communities in general. In fact, the vast majority of these studies were concerned with groups or assemblages of species, rather than a single species, reflecting the need to target and handle coexisting, co-occurring species *in toto* within a system. A further 12% of the papers dealt with applied issues such as the designation and management of marine protected areas, regional conservation strategies and database construction involving the Coral-Triangle and adjacent countries including Indonesia, Philippines, Vietnam, Malaysia, Thailand and Taiwan.

Unlike many symposium proceedings where works are accepted with no or very light reviewing, papers for this Special Volume have gone through the same rigorous reviewing process as regular research papers published in *Hydrobiologia*, in line with the current editorial policy of the Journal. Unfortunately, this has resulted in only a small proportion of submitted papers being accepted for publication, which in turn represent a very small proportion of works presented at the Symposium. While such ‘selectivity’ is naturally expected at the cutting edge of scientific publishing, there is no denial of the fact that the current compilation of papers can neither convey the full breadth of research presented at the Symposium, nor reflect the research trends and directions among individuals and organisations involved in research on the tropical and subtropical waters of Asia. Indeed, this sharply reflects the challenge that marine biodiversity research conducted by those based in the Asia-Pacific region (particularly the tropical South-East Asia) faces, in the sense that dissemination of research outcome is strongly constrained by the standard set by accumulated research experience predominantly linked to less species-rich systems of the world. Thus, in addition to often-inadequate socio-economic infrastructure for research in many of the Indo-Pacific countries, researchers must scale ‘raised’ academic hurdles to have their research recognised on an international platform.

Arguably, while science is considered to be a single and universal entity that is supposed to be judged

against what are termed ‘objective’ criteria, in reality ‘objectivity’ is more often than not in the eyes of the beholders at a particular point in time and space of academic world. The implication is that newly instituted research involving more complex, more environmentally heterogeneous and more species-rich systems in less well-investigated parts of the world is often at a practical disadvantage and faced with an uphill struggle of demonstrating its worth in a competitive world of science and academia. The relative paucity of research papers conducted by researchers in South East Asia is something we all notice and hope to see changed at an accelerated pace. Surely, an increased research effort from tropical/subtropical Asia would constitute an important base on which the future of the global centre of marine biodiversity depends. In this respect, the Symposium and the collection of papers in this volume are just a ‘harbinger’ of this important move, for all those concerned with global marine environment and biodiversity.

Importantly, as a by-product of this Symposium, a new academic society has now been formed: the Society for Coastal Ecosystems Studies—Asia Pacific (<http://www.scesap.org>). The Society extends the Symposium’s goal to become a focal point of information exchange and dissemination in the areas of coastal biodiversity and ecosystems studies, particularly in high-diversity areas of Asia and beyond, in the

years to come. The Society is unique in that it is probably the first Asia-based, pan-Asian academic society with incorporated headquarters.

We would like to thank the following organisations for their financial and other support that enabled this symposium: the Global COE programme and the Center for Asian Conservation Ecology led by Prof Yahara of Kyushu University, the APBON-associated S-9-5 project team, the Japan Agency for Marine-Earth Science and Technology, and the town of Reihoku in Amakusa, Japan. Our thanks are also due to Prof Martens, Mr Deepan Selvaraj and the editorial team of *Hydrobiologia* for their unstinting support during the preparation of this volume. We dedicate this volume to all those concerned with the future of coastal environments in Asia.

References

- Tokeshi, M., 1999. Species Coexistence: Ecological and Evolutionary Perspectives. Blackwell Science, Oxford.
- Tokeshi, M. & S. Arakaki, 2007. On estimating diversity in species-rich fish assemblages: an example with coral reef fishes of eastern Indonesia. *Journal of Fish Biology* 71: 1879–1887.
- Tokeshi, M., S. Arakaki & J. R. P. Daud, 2013. Consuming diversity: analysis of seasonal catch patterns in multi-species artisanal reef fisheries in North Sulawesi, eastern Indonesia. *Pacific Science* 67: 1–13.