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Chief Editor José Paula



**Coral reefs
of Mauritius
in a changing global
climate**

Western Indian Ocean JOURNAL OF Marine Science

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Aims and scope: The *Western Indian Ocean Journal of Marine Science* provides an avenue for the wide dissemination of high quality research generated in the Western Indian Ocean (WIO) region, in particular on the sustainable use of coastal and marine resources. This is central to the goal of supporting and promoting sustainable coastal development in the region, as well as contributing to the global base of marine science. The journal publishes original research articles dealing with all aspects of marine science and coastal management. Topics include, but are not limited to: theoretical studies, oceanography, marine biology and ecology, fisheries, recovery and restoration processes, legal and institutional frameworks, and interactions/relationships between humans and the coastal and marine environment. In addition, *Western Indian Ocean Journal of Marine Science* features state-of-the-art review articles and short communications. The journal will, from time to time, consist of special issues on major events or important thematic issues. Submitted articles are subjected to standard peer-review prior to publication.

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Word from the Editor

The last couple of years have been a time of change for the Western Indian Ocean Journal of Marine Science. The journal has a new and more modern layout, published online only, and the editorial Board was increased to include more disciplines pertaining to marine sciences. While important challenges still lie ahead, we are steadily advancing our standard to increase visibility and dissemination throughout the global scientific community. The central objective of the journal continues focused on the Western Indian Ocean region and serving its growing scientific community.

We are pleased to start the publication of special issues of the journal, launched here with the publication of manuscripts from the University of Mauritius Research Week 2016. The special issues aim to contribute for advancing marine science in the WIO by focusing on specific themes, geographical areas or assembling contributions from scientific meetings. The editorial processes are exactly the same as for regular issues, with double peer-review, and guest editors are considered.

José Paula
Chief Editor

Editorial Note • Coral reefs of Mauritius in a changing global climate

The University of Mauritius Research Week (UoM RW) has been held on an annual basis since 2007 and was organized for the 9th time from 19-23 September 2016. The Research Week is geared towards dissemination of knowledge generated through research activities at the University and by relevant stakeholders in accordance with the UoM's vision of "*Excellence in Research and Innovation*". In line with national priorities, the UoM organizes this event to provide insightful research outcomes not only for the advancement of academic knowledge, but for the benefit of the community at large, through robust policy recommendations.

Out of the multiple submissions made during the UoM RW 2016, a number of manuscripts in the field of ocean/marine sciences were selected to be published in the Western Indian Ocean Journal of Marine Science (WIOJMS), as a special issue entitled "Coral reefs of Mauritius in a changing global climate". This issue is presented in the context of Mauritius being surrounded by a beautiful but delicate coral reef ecosystem, which provides ample ecosystem services contributing to the national economy, but which is subjected to extreme climatic events. Hence, in this special issue several contributions advancing our scientific understanding for sustainable use and management of marine resources in a globally changing marine environment are articulated. The original article by Mattan-Moorgawa *et al.* investigates the photo-physiology of diseased and non-diseased corals. Coral diseases are becoming more common on reefs worldwide due to both local and global stressors. Ramah *et al.* then present a short communication related to substrate affinity by two giant clam species found on the Mauritian coral reefs. Giant clams are under threat worldwide and information on their substrate affinity and habitat aims at providing insightful information towards their sustainable management. In addition, Nandoo *et al.*, in an effort to optimize nucleic acid extraction protocols from marine gastropods, present an original article based on a comparative study using the gastropod genera *Planaxis*, *Cypraea* and *Drupella*. These marine gastropods are ecologically important for coral reefs, especially the coral-eating *Drupella*. Moreover, given the importance of intertidal molluscs, Kaullysing *et al.* document the density and diversity of the benthic molluscs while comparing sheltered and exposed coastal habitats. Appadoo & Beeltah report on the biology of *Platorchestia* sp. (Crustacea, Amphipoda) at Poste La Fayette, Mauritius. Studies on Amphipod diversity and distribution are important especially since studies on marine biodiversity are scarce around Mauritius. Another original article by Ragoonaden *et al.* analyses the recent acceleration of sea level rise in Mauritius and Rodrigues. Such studies are more important than ever in the light of a globally changing marine environment with small island states faced with issues related to rising sea level. Two field notes, based on field observations, are presented by Bhagooli *et al.*, documenting a variety of coral diseases, and *Stylophora pistillata*-like morphotypes occurring around Mauritius Island, respectively. Kaullysing *et al.* also present a field note on coral-eating gastropods observed around Mauritius.

Apart from the local contributors, international collaborators also contribute two original articles in this special issue. Casareto *et al.* characterize the chemical and biological aspects of a coral reef of Mauritius focusing on benthic carbon and nitrogen fixation. These studies related to benthic productivity are important for understanding sustainability of coral reefs and/or lagoonal fisheries. On the other hand, Tokumoto *et al.* document the first detection of membrane progesterin receptor (mPR)-interacting compounds from Mauritian coral reef and lagoonal seawater. They used cutting-edge technology to detect key regulators of reproduction in seawater. These contributions in terms of original articles, short communications, and field notes generate new scientific knowledge that may better inform policy and decision making in the field of coral reef studies and management in Mauritius, while contributing to the understanding of coral reefs in the wider Western Indian Ocean region.

Prof. Sanjeev K. Sobhee
Pro-Vice Chancellor (Academia)
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A first field report of coral diseases around Mauritius Island, Western Indian Ocean

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Coral diseases were surveyed at two lagoonal sites, namely Flic en Flac and Belle Mare around Mauritius Island for the first time in October (summer month) 2013. As part of a rapid visual assessment, 30 randomly-selected coral colonies were inspected for coral disease signs at three stations per site among branching *Acropora muricata*, tabular *A. cytherea*, and branching *Pocillopora damicornis* at Belle Mare, and massive *Porites lutea* at Flic en Flac. Coral diseases were assessed using the underwater cards for assessing coral health as per Weil & Hooten (2008) and Séré *et al.* (2015). *P. damicornis* (disease prevalence $4.4 \pm 1.92\%$) and *A. cytherea* ($2.2 \pm 1.92\%$) at Belle Mare were affected by white band-like (always found with signs of tissue sloughing) and white plague-like (without any signs of tissue sloughing) diseases, respectively, while *P. lutea* ($14.4 \pm 5.10\%$) from Flic en Flac was affected mostly by pink pigmentation response. The dominant coral species at Belle Mare, *A. muricata*, was affected by white plague-like ($20.0 \pm 3.33\%$), white band-like ($13.3 \pm 3.33\%$), brown band ($5.6 \pm 1.92\%$), skeletal eroding band ($8.9 \pm 1.92\%$), and growth anomalies ($7.8 \pm 1.92\%$) (Fig. 1), indicating very high overall levels of disease prevalence. It is noteworthy that field identification of “white” diseases is presumptive and further advanced laboratory-based analyses are required to confirm their exact identities. “White syndromes” is commonly used to group most of the “white” diseases (Bythell *et al.*, 2004).

Though coral diseases have been reported in Kenya (McClanahan, 2004), Maldives (Montano *et al.*, 2012), and in other parts of the Western Indian Ocean (WIO) (Séré *et al.* 2012; 2013; 2015; 2016), this field note constitutes the first documented observations of multiple

coral diseases around Mauritius Island. Given the increasing tendency of coral disease occurrence in the WIO region and worldwide, and given these high levels recorded here, it is recommended that coral disease monitoring be included in coral reef monitoring programmes in an effort to thoroughly assess impacts of coral diseases on the WIO coral reefs.

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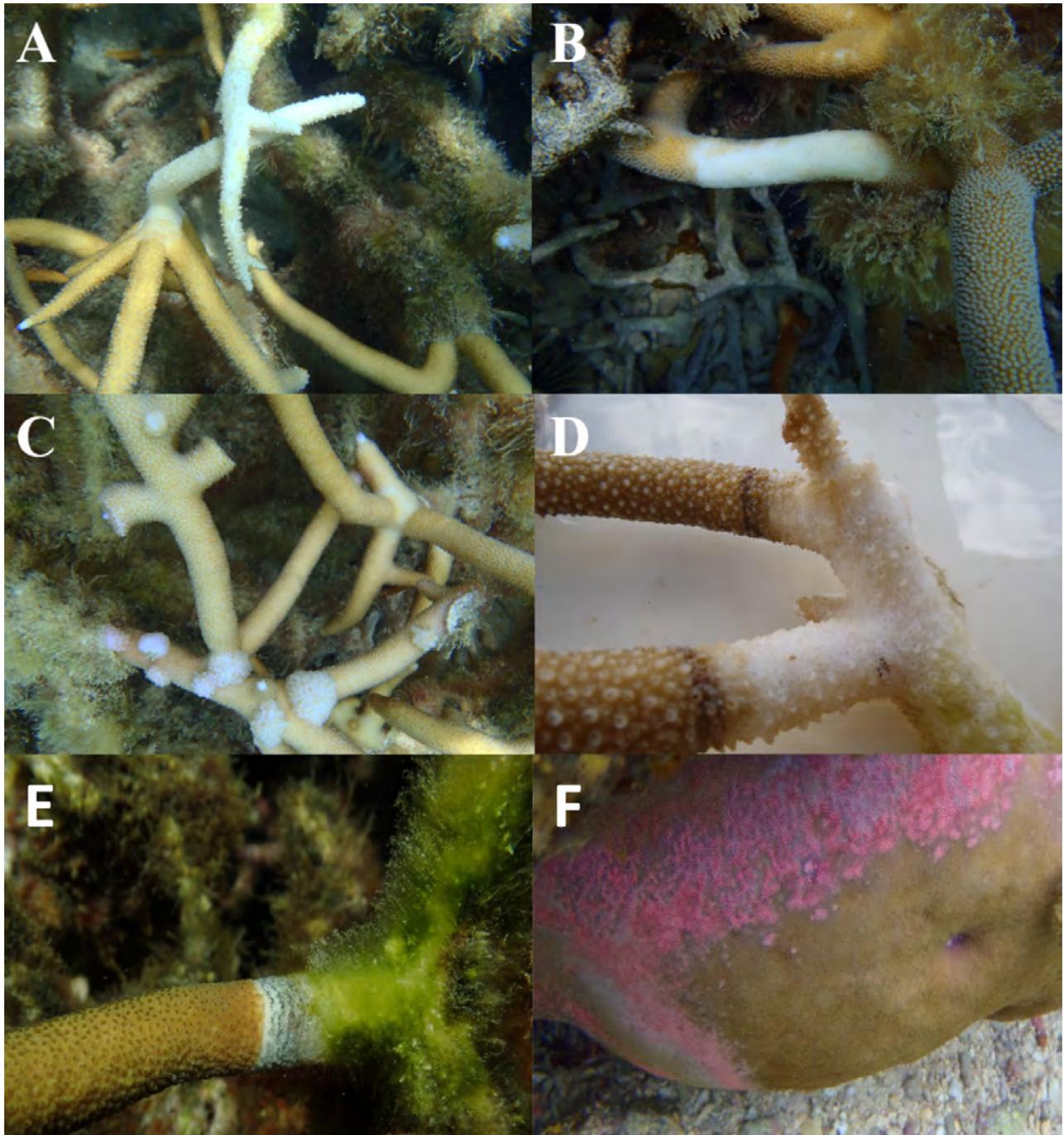


Figure 1. Representative coral diseases or responses found at lagoonal sites at Belle Mare (A – White plague-like; B – white band-like; C – growth anomaly; D – brown band; E - skeletal eroding band affecting *A. muricata*) and Flic en Flac (F – Pink pigmentation response affecting *Porites*), Mauritius Island.

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