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Chief Editor José Paula



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

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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)
The University of Mauritius

A first field report of various coral-eating gastropods and associated infestations around Mauritius Island, Western Indian Ocean

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The contribution of corallivores to coral reef degradation is well documented worldwide (Ayling & Ayling, 1987; Colgan, 1987; Rotjan & Lewis, 2008; Guzner *et al.*, 2010; Gignoux-Wolfsohn, 2012). McClanahan (1994) reported an increase in the gastropod *Drupella cornus* (Röding, 1798) population in Kenyan coral reef lagoons. Rotjan & Lewis (2008) reviewed the impact of coral predators on tropical reefs where the authors highlighted the presence of corallivores on Mauritian reefs. However, information on the location of these corallivores was not provided and no distinction was made between various classes of corallivores. No detailed and reliable scientific information is currently available on corallivory by gastropods in the coastal waters of Mauritius Island.

During a snorkeling survey along the coast, lagoon and reef at Flic en Flac and Belle Mare, Mauritius (20.2000° S, 57.5000° E) in October - November (summer months) 2016, corallivory by gastropods *D. cornus*, *Coralliophila violacea* (Kiener, 1836) and *Coralliophila* sp. were observed at maximum depths of 2 m. Macroalga-enhanced corallivory by *D. cornus* on *Acropora muricata* has previously been reported by Kaullysing *et al.* (2016) at Flic en Flac. However, here we report the first field observations of corallivory by *C. violacea* and *Coralliophila* sp. at Flic en Flac and by *D. cornus* at Belle Mare (Fig. 1). *D. cornus* individuals were observed to feed on *A. muricata* tissues at lagoon and reef colonies in Belle Mare. At the Belle Mare lagoonal site in November 2016, 5 colonies as per Fig. 1G

(90.80±14.92 individuals m⁻²) and 7 colonies as per Fig. 1H (158.14±13.85 individuals m⁻²) were observed where large segments (0.5 to 0.8 m in diameter) of the colonies were completely denuded of their tissue reflected by fresh white skeleton with bare corallites visible to the naked eye. These observations indicate severe infestations, and recent rapid coral predation and damage. At Flic en Flac, *Coralliophila* sp. was observed only on coastal and lagoonal *A. muricata* colonies, while *C. violacea* was found to prey exclusively on *Porites* sp. in the lagoon and reef. *A. muricata* which is reported to be the preferred diet of *Drupella* spp. (Morton *et al.*, 2002; Al-Horani *et al.*, 2011) was indeed the most common host for gastropod predation in Mauritian waters as well. To thoroughly understand the contribution of these corallivores towards reefs degradation, further investigation is warranted on their distribution and rates of feeding on the respective coral species (Guzner *et al.*, 2010).

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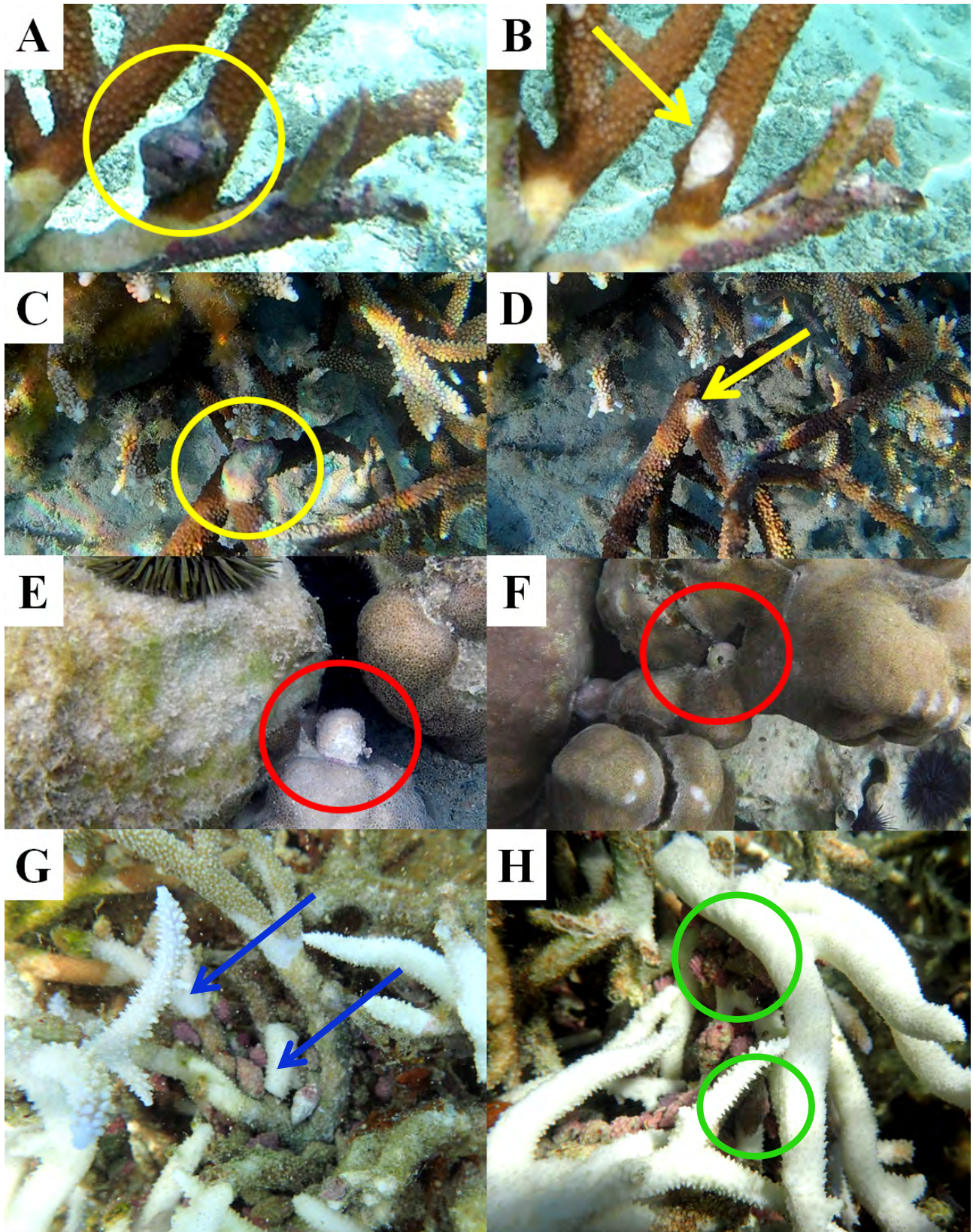


Figure 1. Corallivore gastropods feeding on coral colonies at Flic en Flac (A, C – *Coralliophila* sp. on *Acropora muricata* indicated by yellow circles; B, D – White predation scars indicated by yellow arrows after removal of *Coralliophila* sp.; E, F – *C. violacea* encrusted on *Porites* sp. indicated by red circles) and Belle Mare (G – *Drupella cornus* feeding on *A. muricata*, leaving behind completely whitened coral segments shown by blue arrows; H – *D. cornus* individuals sheltered underneath *A. muricata* branches indicated by green circles).

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