



**HAL**  
open science

# Stalked and fleshy life forms photographed on Banc Gail (southwestern lagoon, New Caledonia), a site heavily impacted by hypersedimentation

Philippe Borsa

► **To cite this version:**

Philippe Borsa. Stalked and fleshy life forms photographed on Banc Gail (southwestern lagoon, New Caledonia), a site heavily impacted by hypersedimentation. Proceedings of the 11th Pacific Science Inter-Congress, Tahiti, French Polynesia, 2-6 March, 2009, 2009, Papeete, French Polynesia. hal-00554676v1

**HAL Id: hal-00554676**

**<https://hal.science/hal-00554676v1>**

Submitted on 11 Jan 2011 (v1), last revised 13 Jan 2011 (v2)

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

To be cited as:

Borsa P., Folcher E., Gilbert A. 2010 - Stalked and fleshy life forms photographed on Banc Gail (southwestern lagoon, New Caledonia), a site heavily impacted by hypersedimentation. In Mery P. (ed.) Proceedings of the 11th Pacific Science Inter-Congress, Tahiti, French Polynesia, 2-6 March, 2009. PSI2009/445, ISBN N°978-2-11-098964-2.

## Stalked and fleshy life forms photographed on Banc Gail (southwestern lagoon, New Caledonia), a site heavily impacted by hypersedimentation

P. Borsa - E. Folcher - A. Gilbert

Institut de recherche pour le développement, BP A5, 98848 Nouméa, New Caledonia

E-mail: philippe.borsa@ird.fr

### ABSTRACT

Previous research has shown that a 100-km<sup>2</sup> area in the central part of the southwestern lagoon of New Caledonia ('Banc Gail') consists of a field of mud-mounds built on oyster reefs. Erosion caused by land clearing and mining is assumed to have dramatically increased hypersedimentation in a recent past, which in turn is thought to have caused the extinction or near-extinction of Banc Gail's oyster populations. SCUBA-diving exploration of Banc Gail revealed a peculiar ecosystem now dominated by stalked or fleshy, mucus-producing corals.

### Keywords

Hypersedimentation – mud mound – oyster reef – dead community

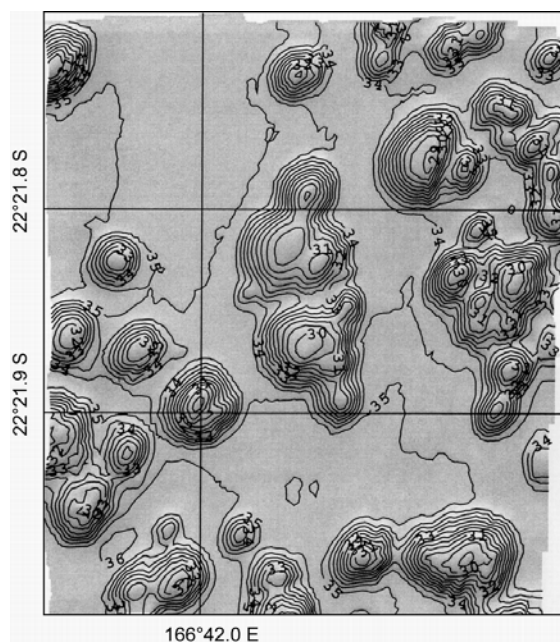


Figure 1. Bathymetric map of a part of Banc Gail, taken during cruise 2005-NC-PL of RV Alis. Isobaths drawn every 0.5 m (redrawn from [2]).

### 1. INTRODUCTION

Circulation modelling of the southwestern lagoon of New Caledonia has shown a permanent gyre in its central, deeper part [1]. The gyre revolves around a shoal ('Banc Gail') that extends over a surface of approximately 100 km<sup>2</sup>. Gyres retain buoyant particles and allow the sedimentation of the denser particles. Bathymetric maps of Banc Gail produced from multiple-beam sonar images have revealed a tormented landscape that consists of a field of about one thousand evenly spaced mounds 40-120 m wide and 1-6 m high above the flat bottom at -35 m ([2]; Figure 1). Drilling the summit of two mounds has uncovered reefs of sub-fossil oyster shells, *Hyotissa hyotis* (Gryphaeidae), filled with mud [2, 3].

### 2. OBSERVATIONS AND DISCUSSION

Banc Gail is presently a site of hyper-sedimentation as shown by the muddy bottom and the abundance of silt particles in the water column. Massive land clearing and mining within the last century [4] is likely to have led to a significant increase in the input of sediment into the lagoon. It is here hypothesized that the mounds initially grew by the accumulation of live oysters, and that the latter were recently driven extinct or near-extinct by hypersedimentation.

A proportion of the animals presently encountered on the summits of the mud mounds of Banc Gail ([2, 3]; present note) possess stalks or have long, inflatable bodies (Figure 2 a-d) that presumably allow them to permanently stay clear above the accumulating mud. Abundant mucus production is probably essential to the survival of those animals since mucus agglomerates silt particles and facilitates their ejection (Figure 2c, d). This also facilitates and enhances their sedimentation.

### ACKNOWLEDGMENTS

We are grateful to C. Chevillon (Province sud, Noumea) for a stimulating discussion and for encouragement in writing the present note, and to IRD-DRV for support.

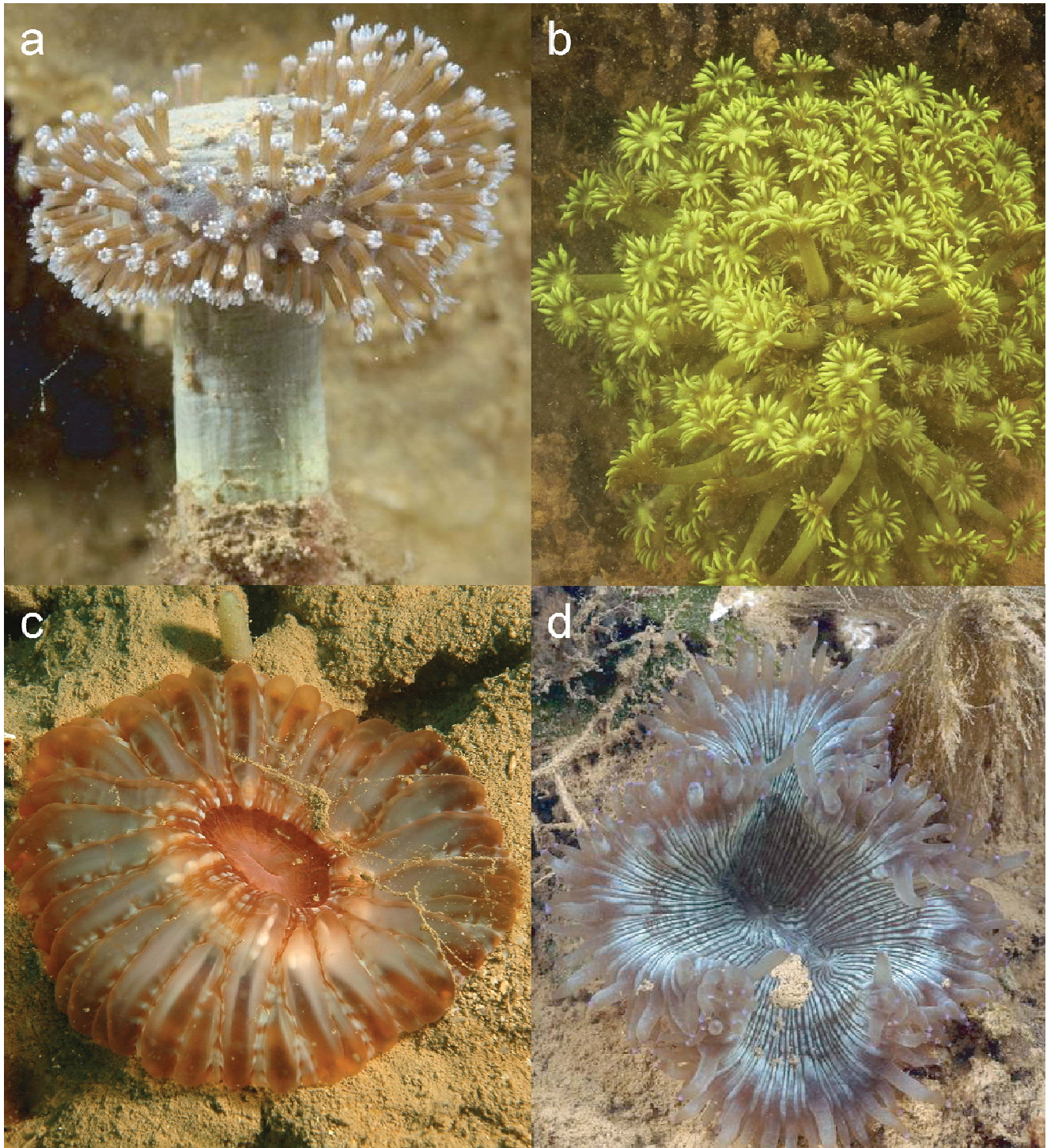


Figure 2. Staked and fleshy corals occurring on the summits of Banc Gail mud mounds (selection of photographs from a series taken by E.F., 2005-2008): (a) Undetermined alcyonarian of family Xenidae; (b) *Goniopora* sp. (Poritidae); (c) Inflated *Cynarina lacrymalis* (Mussidae) shedding mucus and silt; (d) *Catalaphyllia jardinei* (Caryophyllidae) ejecting agglomerated silt particles.

## REFERENCES

- [1] Douillet, P., Ouillon, S., and Cordier, E. 2001. A numerical model for fine suspended sediment transport in the southwest lagoon of New Caledonia. *Coral Reefs* 20, 361-372.
- [2] Pelletier, B., Chevillon, C., Menou, J.-L., Butscher, J., Folcher, E., Geoffray, C., Boré, J.-M., Panché, J.-Y., and Perrier, J. 2006. Plongées, forage et cartographie, baie du Prony et banc Gail, lagon sud de la Nouvelle-Calédonie. *Rapports de Missions Sciences de la Terre Géologie Géophysique (IRD Noumea)* 70, 1-44
- [3] Laboute, P. 1988. The presence of Scleractinian corals and their means of adapting to a muddy environment: the “Gail Bank”. *Proceedings, 6th International Coral Reef Symposium, Townsville* 3, 107-111.
- [4] Pascal, M., Richer de Forges, B., Le Guyader, H., and Simberloff, D. 2008. Mining and other threats to the New Caledonia biodiversity hotspot. *Conservation Biology* 22, 498-499.