Zoantharia of New Caledonia

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Although present in New Caledonia, zoanthids were poorly studied in that region. The "Mission Ranson en Océanie" in 1952 collected one species from New Caledonia. This sample was described as new species in 1956 by Pax & Muller. In 1979, Dr. B. Thomassin collected one sample and Dr. J. Picard in 1980 sampled two colonies. Unfortunately this material was not described and studied at the time of collection. After more than 20 years in formalin and stored in poor conditions, this material is of poor scientific use. More recently, a few deep sea samples were collected by the Dr. B. Richer-de-Forges during different collecting missions. In 1989, two missions (SMIB4 and MUSORSTOM4) a very special zoanthid associated to a eunicid worm was observed *in situ* and collected. In 2005, during the EBISCO cruise three samples of zoanthids belonging to two different species were sampled. A mission focusing on new caledonian zoanthids will be held in November 2006. The samples collected and analysed on this occasion will complete the few data already available.

The actual status of zoanthid taxonomy is very confused due to many inaccurate species description, lost type samples and mainly due to the lack of taxonomically relevant morphological characters. The development of the molecular techniques offers a good alternative to histological and cytological methods. The future of zoanthid taxonomy probably relies on a combination of molecular, morphological and ecological characters (Sinniger *et al.* 2005, Reimer *et al.* 2004).

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Annotated list of the taxa

* indicates deep sea taxa.

Suborder Macrocnemina

Family Epizoanthidae Delage and Hirouard, 1901

**Epizoanthus* aff. *abyssorum*: According to Carlgren (1923) those *Epizoanthus* specimens would belong to the species *abyssorum*. However, this species was found only in north-east Atlantic. As we had no atlantic samples to compare, we cannot be totally confident on the specific status of those samples. This zoanthid grows on shells inhabited by pagurids forming a carcinoecium. The greyish-yellow coloration is given by the incrustations composed of Globigerina ooze (sediment mainly composed of planktonic foraminiferans tests). The colonies are composed of 7 side polyps and 1 to 3 dorsal polyps. The samples were collected off New Caledonia around SE Fairway between 883m and 957m deep.

Epizoanthus spp.: Although no shallow water specimens were found yet in New Caledonia, the presence of this zoanthid is almost sure below 10m, maybe even higher. As those organisms once contracted look like a sandy crust on the substrate they are often ignored or missed.

Family Parazoanthidae Delage and Hirouard, 1901

*Undetermined Parazoanthidae: This epizoic zoanthid groups within the Parazoanthidae family. The hexactinellid spicule used as substrate is characteristic for a few species of *Epizoanthus* and *Isozoanthus* (Carlgren 1923). If molecular results exclude clearly this species from the genus *Epizoanthus*, the situation is less clear concerning *Isozoanthus*. More histological and molecular analyses would be necessary to answer this question. A polychaete worm is associated to both samples. Such an association (with *Eunice mindanavensis*) was also found by Carlgren with *E. fatuus*, *E. planus*, *I. valdiviae*, *I. arenosus* and *I. africanus*.

Parazoanthus spp.: Although no shallow water specimens were found yet in New Caledonia, the presence of this zoanthid is almost sure below 10m, maybe even higher. Species of this genus are most of the time closely associated with other organisms such as sponges, hydrozoans or diverse anthozoans.

Suborder Brachycnemina

Family Sphenopidae Hertwig, 1882

Sphenopus spp: The single non-colonial brachycnemic zoanthid. It lives buried in the sand with tentacles expanding at night. Specimens of this genus were caught in tropical Indian and Pacific oceans. The presence of this discrete species is possible in New Caledonia.

Palythoa spp.: This genus includes the former genus *Protopalythoa* (Reimer *et al.* 2006). The single zoanthid species from New Caledonia described in the literature is *Palythoa poeciloderma* (Pax and Muller 1956). Three different specimens belonging to this genus were collected in intertidal reef environment by Dr. J. Piccard in 1980. However, due to conservation issues, those samples are unidentifiable at the specific level. The development of the coenenchyme of this colonial zoanthid is very variable among species. In some species the polyps can be totally immersed in the coenenchyme whereas in others the coenenchyme will be reduced to a thin basal layer encrusting the substrate. A few species of this genus are surely present in New Caledonia shallow waters.

Family Zoanthidae Gray, 1840

Zoanthus spp.: They are some of the most common zoanthids present in tropical waters. A *Zoanthus* specimen was collected by Dr. B. Thomassin in 1979. This sample comes from the Isle of Pines but no indications on the depth are available. However this genus is likely to be found in shallow waters as it lives in symbiosis with *Symbiodinium* dinoflagellates. A few species of this genus are surely present in New Caledonia shallow waters.

Isaurus spp: Characterised by an asymmetric column, the polyps of this genus are open only at night. Three species (*I. tuberculatus*, *I. cliftoni* and *I. maculatus*) were recorded from Fiji (Muirhead and Ryland 1985), they could be present in New Caledonia especially *I. tuberculatus* and *I. cliftoni* which are present in Australia too.

Acrozoanthus australiae: This monospecific genus is very similar to *Zoanthus* from which it differs mainly by the epizoic status, growing on eunicid worm tubes. Differences in asexual reproduction and cnidome composition distinguish this genus from other zoanthidae. It is known from Indonesia and Great Barrier Reef (Ryland *et al.* 2004), thus its presence in New Caledonia is possible.

INCERTAE SEDIS

*Undescribed zoanthid: This very particular zoanthid was collected in different localities (South of the Isle of Pines, Sponge Bank) at depth ranging between 490 and 650m. This zoanthid build arborescent colonies in association with a eunicid worm. It is not clear until now if the zoanthid colonises the worm's tube or if the worm installs himself in the zoanthid colonies. Observation of the samples would rather suggest that the arborescent shape of the colony results of the zoanthid as branches without worm were found. Polyps are regularly distributed at the surface of the very dense coenenchyme building the arborescent structure. The solidity of the coenenchyme results in the extremely important incrustation of sand particle. No similar species where ever collected or observed until now in other parts of the world. Unfortunately, due to formalin fixation those samples were not suitable for molecular analyses. This zoanthid was photographed in situ and mentioned, with the pictures, in Laboute and Richier-de-Forges (2004).

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