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LE BLANCHIMENT CORALLIEN : CAUSE DE PROLIFÉRATION LATENTE DE *GAMBIERDISCUS TOXICUS*

CORAL BLEACHING AS A CAUSE OF POTENTIAL PROLIFERATION OF *GAMBIERDISCUS TOXICUS*

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From march-april to july 1991, an important bleaching event occurred in most reefs of Society Islands. Severity of the bleaching and mortality of scleractinian corals varied according to genera. Among the dominant (Pocillopora, Acropora, Montipora, Porites), Acropora was the most sensitive : in some areas of Moorea and Tahiti, many of its colonies bleached and a quarter died, then were covered by macroalgae (2). The succession of algal populations did not show any specific character linked to bleaching. A turf of indistinct flora set up first, followed one month later by a turf with dominant filamentous or calcareous red algae mainly Florids and brown algae, that roughly maintained until july (C. PAYRI, personal communication).

MATERIALS AND METHODS

The populations of the dinoflagellates *Gambierdiscus toxicus* associated to these macrophytes were quantitatively monitored in may, july and september 1991 in a few samples of dead branching Acropora and Pocillopora from Tahiti (Pirae pass, Arue fringing reef) and Moorea (Tiahura outer reef slope), using our routine method of sampling and counting (1).

RESULTS

The presence of *G. toxicus* was noted in all the samples. The densities of the dinoflagellate per gram of algae (GTD) ranged from 250 to 800 without significant variation in the same area from a sample to another during the coral bleaching event. In some Tahitian Acropora samples from may 1991, GTD was higher on bleached dead corals than on the other dead Acropora from the neighbourhood. One year later, GTD decreased under 50 in surveyed Acropora and none difference was pointed out with the neighbour and coral colonies.

From the available data, the highest GTD among the macroalgae covering dead Acropora and Pocillopora were observed about 3 to 4 months after the onset of the bleaching event.

DISCUSSION

It seems that when a new surface is offered to macroalgal colonization the best environmental conditions for a proliferation of *G. toxicus* are filled during a few months period. The coral reef community is probably the most complex in the sea and a very delicate balance must exist between organisms in competition such that any change in the environment can result in the proliferation of one at the expense of the others. The dinoflagellate *G. toxicus* appears as one of these competing forms. It was one of the first microalgae developing massively among opportunist macroalgae that cover dead bleached surfaces in normal ecological succession. As far as the ability of *G. toxicus* to produce ciguatoxin might depend upon the strain or the associated microflora, (of which mainly bacteria), it would be interesting in the future to culture clones of *G. toxicus* sampled in macroalgae covering dead bleached corals and check their toxicity.

Since 1980 bleaching events have been increasing in number, extend and severity throughout the global coral reef ecosystem. Links with global warming are evoked. Under this scope their role in the increase of overall ciguatera incidence for the next decades is questionable. This side effect of coral bleaching should be taken in account in any long term global plan to monitor natural and anthropogenic changes on coral reefs.

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