

**Recurring Mass Mortalities of
the White-spined Sea Urchin,
Tripneustes ventricosus,
(Echinodermata: Echinoidea)
in Puerto Rico**

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Thousands of white-spined sea urchins, *Tripneustes ventricosus*, were observed dying in southwestern Puerto Rico during January and February 1995 by some of the authors and other members of the Department of Marine Sciences, University of Puerto Rico (DMS). This mortality was apparently islandwide, but was not well documented in other parts of Puerto Rico. We observed these urchins dying as far away as the east coast, near Humacao and Fajardo, and received reports of mortalities around the island. Students and staff of DMS made estimates of the number of dead and dying urchins while conducting other field studies. No samples were examined or preserved for disease and histological studies. The Caribbean Aquatic Animal Health Project was not informed about island-wide mortalities until after they ceased. An alert sent, at that time, to our informal sea urchin working group (Williams et al., 1991); additional biologists around the Caribbean; the United Nations Caribbean Red Tides and Marine Mortalities Network, Cumana, Venezuela; CARICOMP, Discovery Bay, Jamaica; and the Marine Pathology Network, Virginia Institute of Marine Sciences, elicited no reports of *T. ventricosus* mortalities.

Many moribund urchins were filled with gas and floated near the surface while still able to direct spines toward tactile stimulation. Others lost aboral spines and darkened to almost black in coloration while alive and attached to the bottom. Gas production, loss of spines and darkening suggest that a disease organism was involved in the disturbance but we cannot be sure if this was a primary or a secondary pathogen. This event is similar to a larger-scale mortality of *T. ventricosus* that occurred in southwest Puerto Rico in September to early November 1990 which was attributed to air exposure or higher than normal seawater maximum temperatures (Colon-Jones, 1993). The recurrence of these mortalities suggests that they were not isolated incidents. The extent, frequency and significance of these events must be better understood before we can suggest that they represent a disturbance. The scientific community throughout the West Indies should be alerted to report signs of this problem. *Tripneustes ventricosus* was not the only urchin species to experience mortalities. A smaller-scale die-off

of variegated sea urchins, *Lytechinus variegates*, occurred off Miami, Florida, at the same time the urchins were dying in Puerto Rico (winter 1995). This may be a coincidence, or could be due to similar physical events occurring simultaneously (such as a water temperature minimum). After major coral reef bleaching during the period when seawater temperatures are at maximum (summer–fall), bleaching sometimes recurs when temperatures fall to the annual minimum (winter) (Williams and Bunkley-Williams, 1990). The exact damage caused by these low temperatures has not been explained, but something similar may be involved in these mortalities of urchins. However, the seawater minimum temperatures in southwestern Puerto Rico in 1995 were 2-3°C higher than usual (Bruckner and Bruckner, unpubl. data).

This limited information is presented because few localized mortalities are recorded in the literature (Williams et al., 1986). We also hope this paper will encourage observers to promptly notify the Caribbean Aquatic Animal Health Project in the beginning of an event [Telephone (809) 899-2048 ext 211; FAX 899-5500; E-Mail (Internet): E_Williams@rumac.upr.clu.edu], and to send samples from future mortalities, to allow detailed study and understanding of these disturbances. If samples can be sent, live samples are preferable. If this is not possible some individuals can be frozen in sea-water from the site of the kill (for microbiological studies) and both diseased and dead urchins should be fixed in 10% seawater formalin or 10% buffered formalin (after slitting the peristomial membrane) for histological studies.

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