DISEASE FACTORS WHICH SHOULD BE CONSIDERED IN FISH KILL INVESTIGATIONS

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Although the recent fish kills were widespread in the Caribbean, the possibility of fish diseases contributing to these kills was only examined off eastern Florida, the Cayman Islands, the Netherlands Antilles, and Puerto Rico. As other reports in this volume have noted, the Florida kill may be unrelated, and the Cayman and Curacao (Netherlands Antilles) specimens were preserved or frozen and sent to distant laboratories. The examinations in Puerto Rico were limited because the majority of the few available specimens were saved intact for various agencies in the USA. The few specimens that I examined in Puerto Rico did not possess any unusual parasites or unusual levels of parasites or disease organisms. I have not been able to examine the recent NOAA report (U.S. National Marine Fisheries Service, F/IA1: DW, IFR-81/44, 4 pp.) on the parasite examinations in the Cayman Islands and Florida, but apparently that was the basis for one of the reports in this volume. The majority of people working with the fish kill either felt that looking for disease organisms was too complicated, too time consuming, required too much sophisticated equipment, or could be handled more effectively by sending frozen or preserved specimens to distant labs. I would like to briefly describe three very simple, very quick tests that, with a bare minimum of equipment, can be used to detect the majority of diseases that can cause fish kills. Preserved or frozen specimens are often very difficult or impossible to examine for these organisms. These tests are: (1) kidney smear on bacterial media, (2) external scraping, and (3) gill filament clipping. Stressed, dying fish-
contaminated by organisms associated with decomposition. Fish have to literally be “crawling with” disease organisms in order to be harmed. Therefore, these organisms are “easy” to find. The Kidney Smear Test involves aseptically removing a portion of the kidney, smearing it on tryptic soy agar, and examining the plate for growth 24 hours later. Growth over the entire smear is positive, no growth or a few small, isolated colonies is negative. The External Scraping Test involves scraping a coverslip over approximately 5 cm$^2$ of the body of the fish and transferring the resulting mucus to several drops of seawater on a microscope slide. Examination under 100 X power of a compound microscope should reveal more than 100 protozoans for a positive. The Gill Filament Clipping Test involves clipping approximately 1 cm$^2$ of gill filaments and placing them under a coverslip on a microscope slide. I have an example result for this test that shows many more than 100 protozoans (*Trichodina* spp.). This protozoan has been found associated with a stressed filefish in Puerto Rico. It has also been implicated in a fish kill that occurred off the Atlantic coast of the USA. Monogenea are organisms sometimes implicated in kills of aquaculture and mariculture fishes and can be very damaging in high densities. Adult internal parasites, such as Digenea, are seldom harmful to the host. Some migrating larval forms, such as Cestodes, can be damaging. Crustacean parasites, such as *Anilocra* spp., which is found near La Parguera, are very abundant, but seldom do much damage to the host. Juvenile isopods will take advantage of fishes confined in fish traps. I do not mean to imply that diseases are always or even usually the cause of fish kills, but they are a potential cause that can readily be confirmed or discounted.
UNUSUAL MASS FISH MORTALITIES
IN THE CARIBBEAN
AND GULF OF MEXICO

AN AD HOC SYMPOSIUM
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