Fisheries and Oceans Pêches et Océans

Canada

SHELLFISH HEALTH REPORT

Pacific Biological Station
Nanaimo, B.C.
V9T 6N7

Sample Information

Case No.:	8361
Collection Date:	October 9, 2013
Location:	Indian Arm, Croker Island (49 25.809' N 123 51.834W)
Species:	Sea Stars (*Solaster dawsoni* n=1, *Pynopodia helianthoides* n=9)
Size / Age:	Various sizes (arm length 85 to 120 mm) / Unknown age
History:	Wild
Purpose:	Investigate the cause of high mortalities in sea stars.
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Macroscopic Observations (n=10)

- All 10 specimens were characterized as either moribund or recently dead. Most individuals had one or more missing or partially detached arms usually with gonad and or gut tissue being expelled from the body, but surprisingly the tube feet were often still responsive. Other observations include: arms were typically limp, the aboral surfaces usually had a mottled appearance and the proximal end (tips) of the arms were often white coloured and suggestive of erosion or a lesion.
- Tissue samples of gut, gonad, and arms were preserved for histology, electron microscopy and DNA.

Histological Examination (n = 10 specimens, 21 slides)

- Tissues examined include: gut, gonad, epidermis, calcareous skeleton, connective tissue, spines, pedicellariae, tube feet and water vascular system.
- Sex ratio: 8 mature females, 1 mature male and 1 unknown (no gonad present).
- Focal areas of tissue necrosis were observed in the tips of the arms of 2 specimens.
- Minor bacterial involvement was observed in association with focal areas of tissue necrosis in 3 specimens; however was not consistent or severe enough to be considered the primary cause of mortalities.
- Varying levels of pathology was observed in all 10 specimens including: hypertrophy, pyknosis, emarginated chromatin and karyorrhexis (fragmentation) of cell nuclei. The tissues and cell types most affected were gut epithelium, connective tissue and coelomocytes. In addition, small spherical and very dense staining basophilic bodies were observed in 3/10 specimens.

- The ciliate *Orchitophyra stellarum* which is known to parasitize the gonads of sea star was not detected in these samples, nor were any other protistan parasites or fungal infections.

Electron Microscopy Ultrastructural Examination (n=4)

Tissue samples from 4 specimens with pathology as noted above were further processed and examined using electron microscopy. Tissues examined include: gut, epidermis, calcareous skeleton, connective tissue and muscle, however no viral particles or virions were detected.

Conclusions

No infectious diseases were detected by histological examination that would help to explain the cause of the mortalities. No viruses were detected in these samples using electron microscopy, however they should not be completely ruled out at this time as they are notoriously difficult to detect. Although the cause of the high mortalities in sea stars remains to be a mystery; the existing samples will be retained for future investigation and available to other researchers upon request.

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November 13, 2013
Date