

## *Pycnopodia helianthoides*



### **Progression of wasting syndrome in *Pycnopodia* from Jessica Schultz at the Vancouver Aquarium, BC:**

Healthy animals are usually plump with rays that are puffy. In the first stages of the syndrome we see the animals become much flatter and the edges of the rays become much more distinct. They are still moving about but appear emaciated. As the animals become more stressed, they often drop several rays (which wander off on their own for a while). At this point the body wall becomes compromised and bits of pyloric caeca and gonads may become exposed. As things progress, the animals lose the ability to crawl and may even tumble down steep slopes and end up in pile at the bottom. Soon after they die and begin to rot. The bacteria *Beggiatoa* then takes over and consumes all of the organic matter, leaving a scattering of skeletal plates on the bottom. This syndrome develops quickly and I would say that in only 1 to 2 weeks animals can go from looking OK to a white mess of bacteria and skeletal plates.



## *Pycnopodia helianthoides*

Diseased sea stars can look very different in the intertidal (right) vs. subtidal (below)





## *Pycnopodia helianthoides*

**Description from Neil McDaniel** (Neil McDaniel Photography & Cinematography).

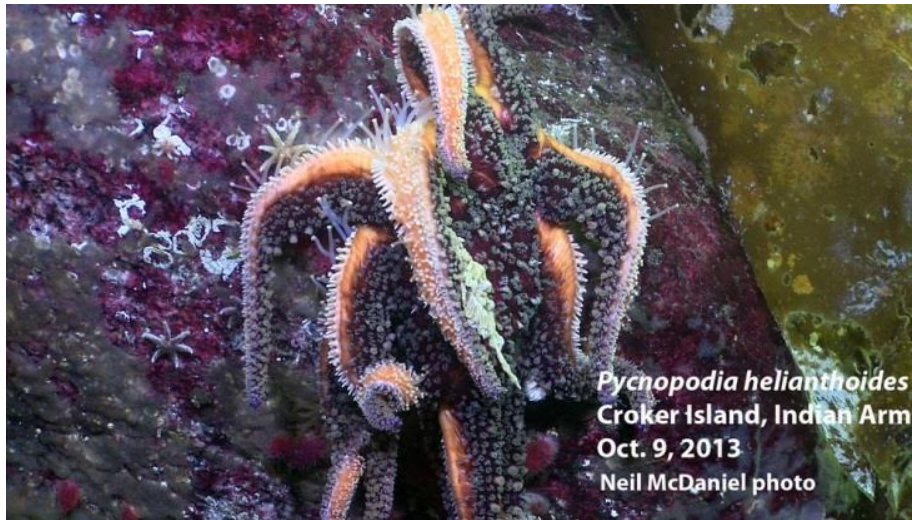
“This applies specifically to *Pycnopodia*, as the syndrome looks a bit different in *Evasterias*, *Solaster dawsoni* and *Pisaster brevispinus*, three other species that are being hard hit. The syndrome was first reported near the end of August in Howe Sound and so far I estimate it has killed tens, possibly hundreds of thousands of *Pycnopodia* in British Columbia waters.”



Croker boulder #1 shows the high densities of *Pycnopodia* that were typical of many parts of Indian Arm and Howe Sound. Most of the stars look OK, but the one just right of center frame is exhibiting the syndrome, looking “thinned-out” and emaciated.

This photo shows the thinning in close-up. Note how distinct the edges of the rays look and how flat the star is.





This photo shows how the body wall begins to rupture, allowing the gonads and pyloric caeca to spill out.

This photo shows the gonads breaking through holes in the body wall. At this point rays often break off and crawl away briefly.





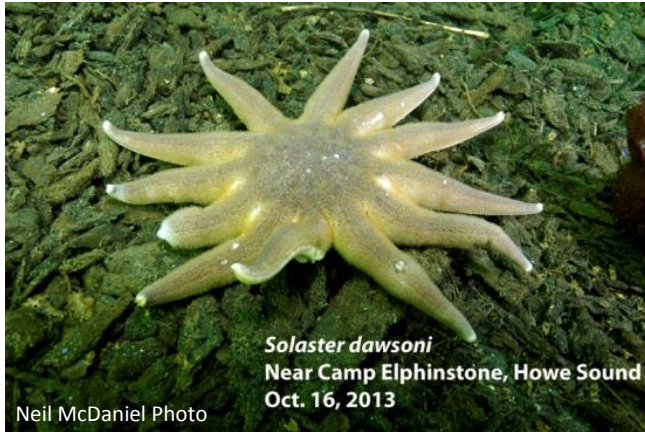
This photo shows a star that has weakened to the point where it has lost its grip on the rocks and fallen to the bottom of a rocky wall.



This photo shows an individual star that is being consumed by mat bacteria.

We believe that the time frame from “appearing normal” to becoming a pile of white bacteria and scattered skeletal bits is only a matter of a couple of weeks, possibly less than that. This syndrome is incredibly virulent.

## *Solaster* spp.

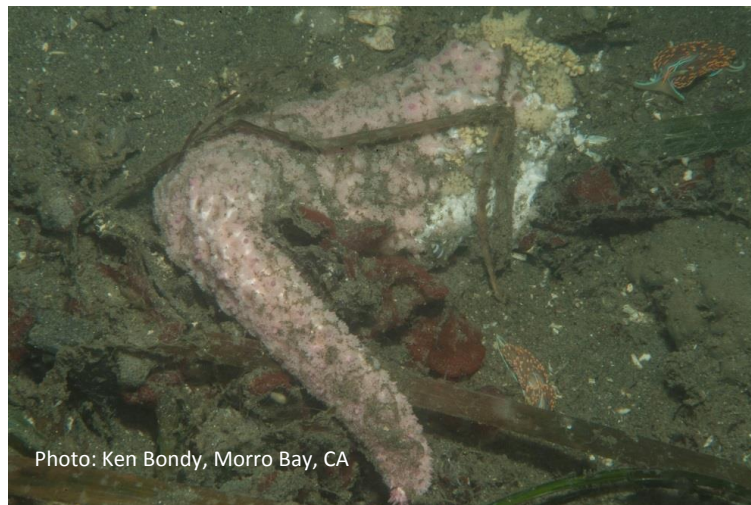




*Dermasterias imbricata*



*Pisaster brevispinus*







*Pisaster brevispinus*





## *Evasterias troschelii*



Photo: Melissa Miner, Post Pt., WA



*Evasterias troschelii*  
With wasting syndrome  
Croker Island, Indian Arm  
Oct. 29, 2013  
Neil McDaniel photo



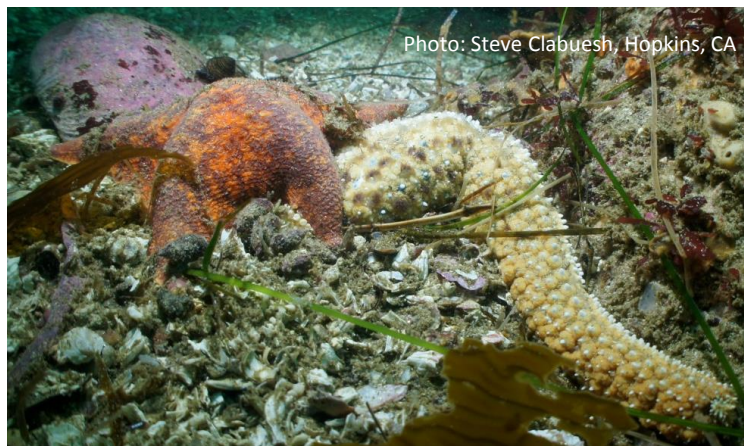
*Evasterias troschelii*  
With wasting syndrome  
Croker Island, Indian Arm  
Oct. 29, 2013  
Neil McDaniel photo



*Evasterias troschelii*  
Note ulcerations in ray  
Croker Island, Indian Arm  
Oct. 29, 2013  
Neil McDaniel photo



## *Pisaster giganteus*



Diseased *P. giganteus* being consumed by *Patiria miniata*. *Patiria miniata* are commonly observed to feed on sick/dying sea stars, and ultimately get the disease themselves.



*Leptasterias* spp.



Photo: Steve Fradkin, Olympic National Park, WA