Are Ostracods a Bio-indicator of Benthic Health?

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Introduction

- Ostracods are considered indicators of sediment quality. (Ruiz et al 2005)
- They are a small (0.5-4mm long) infaunal organism that appears similar to a bivalve.
- They are generally found in the top 1cm of the sediment in estuarine systems.
- They are at least 4 species found in Commencement Bay near Tacoma, WA. (Partridge et al 2010)
- Commencement Bay has a history of pollution that climaxed with its listing as a Superfund site. (Partridge et al 2010) Since the listing several clean-up projects have taken place with the intent of reducing the anthropogenic effects.
- The purpose of this study was to determine whether or not ostracods could be used as bio-indicators of benthic health.

Methods

- 7 sediment samples were collected in Commencement Bay, WA along two separate transects. The stations sampled (Fig. 1) were a sub set of those sampled in the Urban Waters Initiative study done in 2008.
- The samples were analyzed for different physical and biological characteristics in the field and in the lab.
- The different species found were separated out into different taxonomic groupings.

Results and Discussion

- All four different species of ostracods were found in our samples (Fig. 2).
- The deepest site that we sampled at was site 287 and the shallowest locations were at site 303 and 304 (Fig. 3).
- Depth was the biggest influencing factor on ostracod abundance in 2008 (Fig. 4).
- The results of the 2008 Urban Waters Initiative report showed a relationship with the abundance of ostracods and Nickel concentration (Fig. 5 left graph).
- Nickel showed to have a similar relationship with the the ostracods at deeper sites (Fig. 5 right graph).

Discussion

- The data that we found did not suggest that there was any correlation between ostracods and the health of Commencement Bay, however this does not discount the fact that ostracods could be used as bio-indicators.
- Depth is a decisive factor when determining ostracod abundance in depths ranging from 0-40 meters. This was the range that we worked with in our study.
- When the depth is taken into consideration ostracods appear to have correlation with metals and other contaminants.

Conclusion

- Ostracods could potentially be good bio-indicators if they are used with strict parameters. If the study site has a uniform depth than ostracods presence could determine the health of the benthos.
- If this study were to be repeated and the depth of the samples be uniform you could expect to see relative abundance of ostracods. This then could be used to determine whether or not the area is productive or not.

References


Acknowledgements

- Dr. Bonnie J. Becker, Valerie Partridge, Jeff Barney
- University of Washington, Citizens for a Healthy Bay
- Ostracod photos taken by Jon Brit II. In clockwise order
1. Euphilomedes producta 2. Cylindroleberididae sp.
3. Euphilomedes carcharodonta 4. Rutiderma lomae