Improving Accuracy of Larval Crab Population Counts Using DNA Barcoding.

Abstract

Since 2013 there has been a decline in the harvest of Dungeness crab (*Metacarcinus magister*) in south Puget Sound. The Pacific Northwest Crab Research Group (PCRG) is a network that focuses on crab population monitoring using a large-scale larval trapping network of larval light traps. In addition to Dungeness crabs, different crab species are caught in the traps via positive phototaxis. All crab larvae follow the same larval stages, called zoea and megalopa. Larval crab species look very similar, which creates a problem because population counts are often done by volunteers who don't have prior knowledge of megalopa morphology. Gathering reliable population data of the marine organisms caught in the traps requires a clear procedure to identify bycatch. In this research project, I will classify the unknown crab larvae into morphospecies by carefully looking and documenting individual characteristics of each organism. Documents note features such as: carapace shape, carapace width, lateral edges of carapace, telson shape, number of spines, location of spines, antennae, coloration, and overall shape. Morphospecies will be documented along with photographs clearly differentiating anatomical characteristics, which will then be compared to DNA barcoding of the samples by a collaborator at Seattle University. When DNA results return, I will determine if specimens with identical characteristics are genetically matched. This information will be used to make an accurate guide of crab species down to the species level. My results will be shared with PCRG to improve the accuracy of population counts of different crab species which will increase reliability of future PCRG data.