Strength in Numbers – Data Gathering and Analysis Instructions

The following are instructions for gathering and analyzing data from the supplied picture set of Asian Shore Crabs (*Hemigrapsus sanguineus*). With this data, one can compare morphological character differences between male and female shore crabs. The characters being examined are carapace shape and chelae shape. A simple t-Test analysis is used to demonstrate if there are significant differences between the data being compared.

Teachers should be familiar with basis statistical procedures so as to understand the limitations of this exploratory exercise. Ratios are used for comparison, and although this is commonly done in the scientific literature, the use of ratios has its detractors. In a real-life situation the data might be log transformed prior to analysis, or evaluated for variance equality prior to deciding on a particular statistical test.

1) Measure and record width and length of carapace to nearest 0.5 millimeter.

2) Determine if the crab is male or female. Male abdomen narrow and pointed, female abdomen wide and rounded.

3) To standardize the data, divide the Carapace length (CL) by carapace width (CW) and chelae height (ChH) by chelae length (ChL). These established ratios are indicators of carapace and chelae shape. For example, a ratio of CL/CW nearer 1 is an indicator of a more box like shape, while a ratio of .5 is an indicator of a more rectangular shape.

4) Before analyzing the data, activate the Analysis ToolPak (File -> Options -> Add-ins, then select Analysis ToolPak and hit the “Go” button; you may then have to check “OK” after this last step.

5) See example of data analysis in the associated PowerPoint demonstration.