SCALE ANALYSES: AGE & GROWTH RATE

ICHTHYOLOGY LABORATORY

Location: Pasteur Hall Room 225

Objective: Learn how to determine fish age and growth rates from scales.

Hypothesis: It's easy to determine fish age from scales, and fish grow at the same rate throughout their lives.

Agenda:

1) Measure fish total length and remove multiple scales for analysis.

2) Determine fish age by counting annuli on scales. Compare several scales to gain "agreement".

3) Use an ocular micrometer to measure distances from the scale focus to each of the scale annuli and the scale edge.

4) Ask two additional "evaluators" to determine the age of your fish, and make scale measurements.

5) Use the fish total length and the scale measurements to back calculate the size of your fish at the formation of each annulus.

Analysis:

1) Using data from **ALL** fish scales examined by the class, create a summary graph (dots connected by lines) for fish length at each age (or annulus). This graph (or figure) should present fish age (or annulus) on the X axis and fish length on the Y axis, with dots representing means and vertical bars indicating standard errors.

Label this as **Figure 1**, and include a descriptive heading identifying the contents of the figure, the species of fish (including scientific name), the total numbers of fish examined (sample size), and location and date of fish collection.

2) Using data from **ALL** fish, determine the growth (change in length) of each fish each year. For example, growth during the first year is simply the length after that first year (length at first annulus). Growth during the second year is length at age 2 minus length at age 1. Growth during the third year is length at age 3 minus length at age 2, and so on. Determine means and standard deviations for growth during each year, and create a summary graph (dots connected by lines) for fish growth at each age (or annulus). This graph (or figure) should present fish age (or annulus) on the X axis and annual growth (change in fish length) on the Y axis, with dots representing means and vertical bars indicating standard errors. Label this as **Figure 2**, and include a descriptive heading identifying the contents of the figure, the species of fish (including scientific name), the total numbers of fish examined (sample size), and location and date of fish collection.

4) Write a narrative detailing your findings for this lab. Use the figures as points of reference, and call the reader's attention to the main findings of the lab exercise summarized in the figures. Point out the patterns and trends in the data presented in the figures, and explain what these indicate about the growth of the fish. For example, was there any pattern to the change in fish length over the years examined? Was there variability among individual fish? Did fish of all ages grow at similar rates?

Equipment:
Metric rulers, dissecting and compound microscopes, light sources, dissecting tools, microscope slides, data sheets