A COMPARATIVE STUDY OF METHODS FOR OBTAINING MEAN LENGTHS-AT-AGE AND VON BERTALANFFY GROWTH PARAMETERS FOR TWO FISH SPECIES

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ABSTRACT

This study uses the von Bertalanffy growth parameters $L_m$ (asymptotic length) and $k$ (growth rate parameter) as the test statistics to assess whether four length-based methods of determining mean lengths-at-age give the same results and attempts to determine whether accurate estimates of these parameters can be derived when a minimum amount of length data is collected. Whether otolith ageing can be utilized as a standard for these comparisons is also considered.

The Bhattacharya, Cassie and Parabola methods were used to obtain mean lengths-at-age for Eelis oculatus Valenciennes and Acanthocybium solandri Cuvier. These were put into Gulland and Holt plots to obtain final estimates of the growth rate parameter. Length frequency distributions were also subjected to analysis by ELEFAN 1 to obtain further estimates of the parameter. Otolith ageing was attempted with sagittae being used to determine estimates of age-at-length.
In both species the time interval between samples, and the length-based method used, produced significantly different estimates of $L_0$ while the methods produced significantly different $k$s. For both species ELEFAN 1 stood out as being the most different method.

For *E. oculatus*, a "quasi-Gulland and Holt" plot, done on the basis of otolith growth rate and assuming growth increments to be daily, gave an estimate of $k$ on the same order of magnitude as derived from the other length-based methods. Otolith ageing of *A. solandri* gave a value of $k$ some 3.7 times the mean value estimated by the other methods.

It was concluded that the graphical methods gave essentially the same estimates of the growth parameters whilst ELEFAN 1 gave different values. Otolith ageing can be used in these two study species, but it was not possible to obtain validated values for age-at-length or growth parameters.

A further conclusion was that unless legal provisions are made in St. Lucia for the collection of data as part of licencing conditions, stock assessment studies will be severely constrained.