

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_{∞} (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 *Etelis 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_{∞} 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.