

Length Frequency Analysis: Maximum Likelihood Estimation of Finite Mixture Model via EM Algorithm and Bayesian Approach

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Statistical estimation of a finite mixture model is presented for single length frequency data with the peaks lying on the Von Bertalanffy growth curve. By assuming the asymptotic maximum body size to have a normally distributed prior, we show that the variance formulation proposed by Schnute and Fournier (1980) is a special case of our proposed model. The estimation method utilizes the pseudo-alternating EM algorithm and Newton-Raphson method, while the traditional approach cannot guarantee a Generalised EM sequence if some mixing parameters are not well away from zero. Length frequency data of Northern Abalone is presented to illustrate the method.

Key words: Finite mixture model, EM algorithm, Bayesian approach