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*Fitting Markovian binary trees using global and individual demographic data*

**Abstract**

We estimate the parameters of the transient Markovian arrival process (TMAP) controlling the individuals lifetime and reproduction epochs in a Markovian binary tree. The datasets used are population data containing information on age-specific fertility and mortality rates, and we apply a non-linear regression method or a maximum likelihood method, depending on the degree of detail of the available data. We discuss the optimal choice of the number of phases in the TMAP, and we provide confidence intervals for the model outputs. The results are then applied using real data on the endangered black robin bird population.