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Metadata S7

Code for the analysis of whelk diet data

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File list

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Data_S7_Whelk_Code.R
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Description

`Data_S7_Whelk_Code.R`– Supplementary Data S7 contains R code that performs the Bayesian hierarchical analysis of the intertidal whelk (*Vasula (= Thais) melones*) data (Whelk Data S6). The code first manipulates the data to the appropriate form for analysis: from 'long' format where each row is a feeding observation for an individual to 'wide' format where each row contains the summarized diet of each individual. The code then defines the three models fit to the data: 1) a model with all whelks in the same hierarchical level, 2) a model with whelks nested within site, and 3) a model with whelks nested within size class and site (see Appendix S3 for model details). The code fits each model using the program JAGS and the R package 'rjags' (Plummer 2003; 2016). Each model is initialized with a burn-in period of 10,000 steps using 3 Markov chains. After initialization, 2,000 samples are drawn from the posterior distribution from every 100th iteration of the model for each of the three chains. The output provides a list containing the posterior samples of all of the model parameters, the posterior samples of PS_i for each individual, and the average PS_i across individuals.

The code was developed for R version 3.2.4 and requires the R packages 'rjags' (Plummer 2016), 'tidyr' , 'dplyr', 'loo' (Vehtari et al. 2016) , and the program JAGS (Plummer 2003) to be downloaded onto the machine being used for the analysis. The code was

developed using JAGS version 4.1.0.

References

Plummer, M., 2003. JAGS: A program for the analysis of Bayesian graphical models using Gibbs sampling. URL: http://mcmc-jags.sourceforge.net/.

Plummer, M., 2016. rjags: Bayesian graphical models using MCMC. R package version 4-5. URL: https://cran.r-project.org/package=rjags.

Vehtari, A., A. Gelman, and J. Gabry. 2016. Practical Bayesian model evaluation using leave-one-out cross-validation and WAIC. Statistics and Computing **doi:10.1007/s11222-016-9696-4**.