

## **NONLINEAR RELATIONSHIPS AND PHYLOGENETICALLY INDEPENDENT CONTRASTS**

**S. QUADER, K. ISVARAN, R. E. HALE, B. G. MINER, AND N. E. SEAVY**

**Journal of Evolutionary Biology 17 (2004): 709-715**

**ABSTRACT:** The method of phylogenetically independent contrasts is commonly used for exploring cross-taxon relationships between traits. Here we show that this phylogenetic comparative method (PCM) can fail to detect correlated evolution when the underlying relationship between traits is nonlinear. Simulations indicate that statistical power can be dramatically reduced when independent contrasts analysis is used on nonlinear relationships. We also reanalyse a published data set and demonstrate that ignoring nonlinearity can affect biological inferences. We suggest that researchers consider the shape of the relationship between traits when using independent contrasts analysis. Alternative PCMs may be more appropriate if data cannot be transformed to meet assumptions of linearity.