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Endless tests: guidelines for analysing non-nested sister-group comparisons. An addendum

In our review of sister-group comparisons (Vamosi and Vamosi, 2005: *Evol. Ecol. Res.*, **7**: 567–579), we argued for the use of species-diversity contrast tests (e.g. Wiegmann *et al.*, 1993: *Am. Nat.*, **142**: 737–754; Barraclough *et al.*, 1995: *Proc. R. Soc. Lond. B*, **259**: 211–215; Barraclough *et al.*, 1996: *Proc. R. Soc. Lond. B*, **263**: 589–591; Sargent, 2004: *Proc. R. Soc. Lond. B*, **271**: 603–608). Although we still advocate these methods, it was brought to our attention (C. Mitter, personal communication) that we erroneously characterized the analyses by Wiegmann *et al.* (1993) as having been conducted on the difference in untransformed species diversities of the focal clade and its sister group. This error resulted from our interpretation of the statement: 'Because sister groups are equal in age . . . differences between them in diversity, measured here as number of species, reflect different rates of net diversification' (Wiegmann *et al.*, 1993, p. 739). We overlooked a statement later in their paper (p. 743) indicating that 'The Wilcoxon test was performed on the logarithms of species diversities, which are proportional to net diversification rates . . . '. The difference in log-transformed species diversities is equivalent to the logarithm of the ratio of species diversities [i.e. $\log(x/y)$, where x is the number of species in the focal clade and y is the number of species in the sister group]. The null expectation is 0 with multiple sister-group pairs. Therefore, we should have ascribed the method that uses the difference in untransformed species diversities to Sargent (2004).

To summarize, there are four versions of species-diversity contrast tests (Wiegmann *et al.*, 1993; Barraclough *et al.*, 1995, 1996; Sargent, 2004). For reasons that we detail in our original paper (Vamosi and Vamosi, 2005), we recommend against analysing untransformed species diversities. However, Sargent's (2004) conclusion (i.e. a positive association between bilaterally symmetrical flowers and species richness) is upheld when her data are analysed with the other methods. Because they employ a logarithmic transformation, which accounts for the multiplicative nature of diversification, we advocate subjecting either the logarithm of the ratio of species diversities (Wiegmann *et al.*, 1993) or log-transformed ratios (Barraclough *et al.*, 1996) to a Wilcoxon signed-rank test.

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