The BEST matching statistic, ρ

On the mid-right of the main dialog for BEST, the box headed (Correlation method:) now offers three non-parametric choices and one parametric correlation: Spearman rank, Weighted Spearman rank, Kendall tau and Pearson, covered in equations (11.3), (11.4) and (2.3) respectively in CiMC. These are the measures of agreement (matching statistics) between the two resemblance matrices, e.g. biotic and abiotic, and correlations (ρ) are calculated by matching element to element. The logic is that if the true driving abiotic variables are selected, and two sites have very similar suites of values for these, then the assemblages will also be very similar (and *vice-versa*), so the triangular matrix elements should rank in the same order. Ranks are usually appropriate not only because of their central role in PRIMER, underlying a non-metric MDS ordination and the hypothesis testing procedures in ANOSIM and RELATE, but also because the two resemblance matrices may use entirely different coefficient types, e.g. Euclidean distance in (0, ∞) and Bray-Curtis in (0,100). Whilst the above logic then leads one to expect a monotonic relation between their values, there is no reason to expect a linear relationship between a distance and a finite-range dissimilarity, so standard Pearson correlation will generally be less effective. However it is included in PRIMER 7 to cover situations in which, for example, two sets of Euclidean distances, or two sets of Bray-Curtis dissimilarities are being matched, and a standard correlation may then be more acceptable. Though weighted Spearman was constructed to be more relevant to this specialised case of matrix correlations (rather than standard rank correlations of two variables with independent entries), in practice there is rather little to choose between the three rank-based coefficients.

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