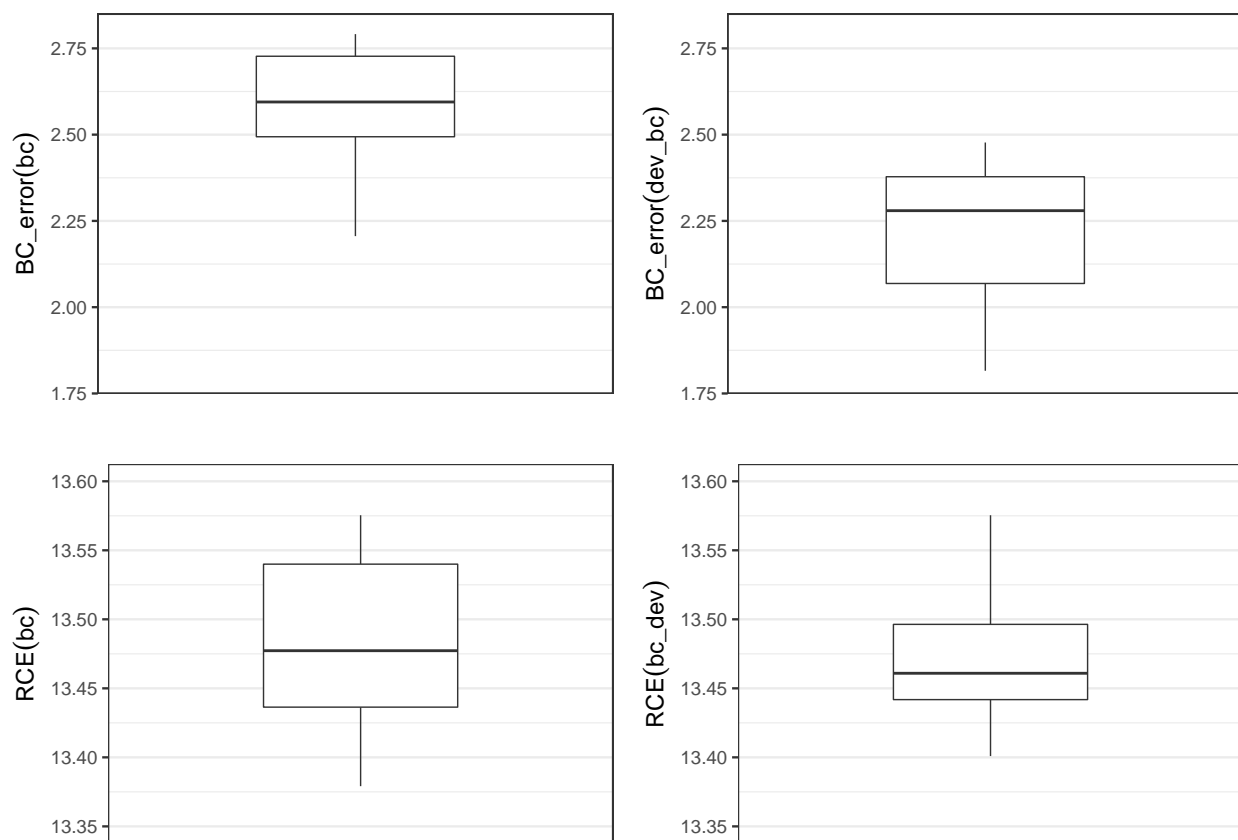# Bray-Curtis Optimization

Using Bray-Curtis dissimilarity, rather than Commonness, for Optimization in spectre

As Sebastian pointed out, Bray-Curtis dissimilarity (BC), derived from commonness and per site richness, contains more information than commonness alone, thus using BC rather than commonness for optimization may allow *spectre* i) to find solutions with higher biological relevance and ii) could change local and global minima of the solution space.

We used the Bangalore bird data set (36 sites, 126 species) and run 15 replicates each using the BC and the commonness optimization approach. Both, Bray-Curtis error (BC_error) and relative commonness error (RCE) were evaluated. If I am right, the BC optimization is in branch **bc**, and the commonness optimization is in branch **dev_bc**, thus BC is shown in the left figures below.

Discussion

For the Bangalore data, using BC optimization resulted in worse solutions, both for Bray-Curtis error and (median) commonness error (RCE). In my opinion, this was caused by differences in the solution space.

Since *spectre* so far gets stuck in local minima, implementation of BC had no benefits. Anyway, if we would reconsider implementing simulated annealing, BC could potentially provide benefits. Just as a reminder, simulated annealing improved solutions by between 10-20 %, but complicated the optimization. Thus we should discuss how to proceed.

Thanks for reading!