

History of canonical correspondence analysis (CCA) in ecology

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In 1986, canonical correspondence analysis entered Ecology (ter Braak 1986) as a multivariate method to relate species abundance data to environment data from the same set of sites. The method was derived as an approximation to the maximum likelihood equation of a non-linear, unimodal latent variable model, and shortly thereafter (ter Braak 1987) as a method that provides the linear combination of predictors that best separates species niches. Independently, Chessel, Lebreton, Yoccoz and Sabatier (1987; 1988a; 1988b; 1989) invented the method as correspondence analysis variant of principal component analysis with instrumental variables (redundancy analysis) and as a generalization of linear discriminant analysis and dual scaling. Now, 25 years later, the founding paper is cited more than 2000 times. Here I reflect on the origin of the method, its uses in Ecology, the role of weighted averaging (principe barycentric), duality diagrams and on the assumptions/conditions under which the method works well.

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