



Plant biomarkers in environmental reconstructions: opportunities and challenges

Boris Jansen, Frédérique Kirkels, and Karsten Kalbitz
University of Amsterdam, IBED-ESS, Amsterdam, Netherlands (b.jansen@uva.nl)

All organisms contain unique combinations of organic compounds and as such, each may provide a unique input of organic matter into soils during the lifetime of the organism and after its demise. When organic molecules persist, either wholly or as a recognizable transformation product, they can serve as molecular proxies (or biomarkers) for identifying previous inputs of organic matter and various biogeochemical processes stimulated by such inputs. Furthermore, such biomarkers may serve as an aid to reconstructions of paleo-vegetation and -climate and/or archaeological activities/land-use. At the same time the input differentiation and (microbial) transformation of organic molecules helps elucidate past and present environmental conditions and shed light on carbon cycling in soils.

In my presentation I will briefly introduce the application of biomarkers in environmental reconstructions; and highlight some of the successes our group has had with biomarker application to reconstruct past forest distribution in Ecuador. However, the main focus will lie on the challenges of biomarker application. In particular I will give a birds-eye view on the following three issues:

1. consistency of biomarker patterns in (present day) vegetation;
2. input of (young) root biomarkers at depth when soils are used as archive;
3. (selective) degradation of biomarker patterns, in particular within soils.

The first challenge will be further elucidated in a separate presentation by Frédérique Kirkels.