

Interactive comment on “Leaf wax n -alkanes in modern plants and topsoils from eastern Georgia (Caucasus) – implications for reconstructing regional paleovegetation” by Marcel Bliedtner et al.

Anonymous Referee #1

Received and published: 25 September 2017

Bliedtner et al. report their results of leaf wax n -alkane compositions in eastern Georgia in the central southern Caucasus region covering grassland and forests. They found that n -alkanes are valid chemotaxonomic indicators to differentiate grasses from trees, with the former containing more longer homologues than the latter. This result does not surprise me although it may not be true everywhere. Nevertheless, I am still not sure if it can be used definitely as a paleovegetation indicator because they did not provide detailed environmental parameters, and numerous studies also tend to attribute changes in n -alkane chain length to climate change. This is a dilemma because veg-

C1

etation may shift with climate change. So what I am interested in is whether the authors can discriminate the separate roles of vegetation and climate factors in modulating n -alkane compositions. So I would like the authors provide more related data and discuss more on them.

1. A more detailed dataset of environmental and climatic parameters, such as temperature, humidity (aridity), precipitation, etc., along the sampling transect, or even for each sampling site, is needed. These data should be examined to see whether and how they influence the n -alkane compositions in general. Authors are encouraged to discuss separate roles of vegetation and environment in modulating n -alkane distributions. For example, as noted in the text, samples 3p, 9p, 25p, 29p, 34p do not show composition patterns as expected. The authors think that these samples may have been influenced by climate. However, the interpretation is rather qualitative and unclear. I guess some plant samples of the same species may have been distributed along climatic gradients. If so, data of these samples are valuable and should be sorted out to see their possible responses to climatic change.

2. The degradation lines in figure 5 are interesting. But it is obvious that the data are much scattering. I would like to see more discussion on the causes of the scattering, including, e.g., climatic factors, disproportional input of leaf waxes to soils from different plants. Also, if the causes are significant, the authors should admit the weakness of the end-member model.

3. As the authors stated in the text, this study is region specific and results appear different from other regions and the globe. It is expected that a comparison of this work with others, and hence a more comprehensive study may improve this paper and is greatly helpful for readers. I suggest the authors give a try.

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2017-277, 2017.

C2