

Interactive comment on “Climate, people, fire and vegetation: new insights into vegetation dynamics in the Eastern Mediterranean since the 1st century AD” by J. Bakker et al.

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I enjoyed reading this paper, which both adds new multi-proxy results and explores new methods of analysis. My few comments should be taken as ideas for developing the work further and widening debates. The main suggestions I would make are

1. The validity of pollen-inferred climate changes during periods of major human land-use change (e.g. Late Holocene) has been a matter of debate. Consequently, it would be helpful if the results presented here could be compared graphically against other independent palaeo-climate data sets for the eastern Mediterranean. Although some of these data are cited, the only real comparison made is with the dendro-climatic results

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of Touchan et al 2007, which covers just the last millennium. An additional diagram might compare Gravgaz against records from sites such as Koca'in cave (Göktürk, Fleitman et al), Nar lake (Jones et al 2006, Woodbridge and Roberts, QSR 2011), Soreq cave (Orland et al. 2009 Quat Res), etc. Of course, palaeoclimatic records do not always agree, because a) dating and therefore correlation is not precise b) the records are not recording the same factors (e.g. seasonality) c) different regions experienced different climate histories. Comparison of different records allows these factors to be evaluated. In the eastern Mediterranean, most records indicate generally dry and cold conditions during the Little Ice Age and warmer and wetter conditions during the Medieval climate anomaly (Luterbacher et al 2012; Roberts et al, Glob Planet Change 2012). The Gravgaz record is overall in good agreement with this pattern. It also shows good agreement with records such as the well-dated sequence from Nar lake back to ca. AD800, but less good agreement before that time. Although this could be due to different climate histories or different controlling factors, I note that the Gravgaz chronology shows some rather dramatic changes in sedimentation rate between 270 and 150 cm (AD300 to AD900). This hints at the possibility that either the 14C sample Beta-257421 may be in error, or that there was an hiatus in this record. In any case, it may be worth adding a sentence to comment on the possible age uncertainty in this part of the record. The authors comment on widespread evidence for climatic aridification around AD650, but in many records this occurs later, around AD750.

2. Charcoal analysis. This study adds to the growing data set about Mediterranean fire histories. However, CHAR is best suited for records with contiguous, not interval sampling, since the latter can “miss” individual fire events. If I understand correctly, the Gravgaz and Bereket charcoals were recorded on pollen slides, taken at intervals of 6.7 and 13.5 cm respectively. It would be helpful if the authors could clarify this in the paper.

Minor comments

3. McNeil, not McNiel

4. Southwest Anatolia has actually one of the best pollen records of any region in the Mediterranean (16 pollen diagrams!), so what is significant for the current paper is that until now, none has high resolution or good dating for the last 1500 years

5. The von Rad et al (1999) study was not from the eastern Mediterranean but the Indian Ocean

Invited review: Neil Roberts

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