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## ***Interactive comment on “Evidence of a prolonged drought ca. 4200 yr BP correlated with prehistoric settlement abandonment from the Gueldaman GLD1 Cave, N-Algeria” by J. Ruan et al.***

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Dear Editor,

I have now completed my review of the manuscript by Ruan et al. “Evidence of a prolonged drought ca. 4200 yr BP....” The manuscript is clear and well written and robustly discussed. I have just one general comment, which concern the fact that some important references on 4.2 event in the Mediterranean are missed. Some are just to improve the reference list like: Dixit Y., Hodell D.A., Petrie C.A. 2014. Abrupt weakening of the summer monsoon in northwest India ~4100 yr ago. *Geology*, 42, 339–342. Others are more specific of central Mediterranean and need to be discussed

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Discussion Paper



and/or inserted in a general figures. For instances:

Finné M., Holmgren K., Sundqvist H.S., Weiberg, E. Lindblom M. (2011) - Climate in the eastern Mediterranean, and adjacent regions, during the past 6 000 years – a review. *Journal of Archaeological Science*, 38, 3153–3173.

More specific are:

Regattieri E., Zanchetta G., Drysdale R.N., Isola I., Hellstrom J.C., Dallai L. (2014a) - Lateglacial to Holocene trace element record (Ba, Mg, Sr) from Corkhia Cave (Apuan Alps, central Italy): paleoenvironmental implications. *Journal of Quaternary Science* 29, 381–392.

This paper is also important because at corkhia cave the 4.2 event is not so clear expressed in the oxygen isotope curve but very well expressed using other proxies. Other short events are here reported more robustly.

Zanchetta G., Di Vito A., Fallick A.E., Sulpizio R. (2000) - Stable isotopes of pedogenic carbonate from Somma-Vesuvius area, Southern Italy, over the last 18 ka: palaeoclimatic implications. *Journal of Quaternary Science*, 15, 813-824.

Zanchetta G., Giraudi C., Sulpizio R., Magny M., Drysdale R.N., Sadori L. (2012a) - Constraining the onset of the Holocene “Neoglacial” over the central Italy using tephra layers. *Quaternary Research*, 78, 236-247.

Zanchetta G., van Welden A., Baneschi I., Drysdale R.N., Sadori L., Roberts N., Giardini M., Beck C., Pascucci V. 2012. Multiproxy record for the last 4500 years from Lake Shkodra (Albania/Montenegro). *Journal of Quaternary Science*, 27, 780-789.

In these last three papers the event is well defined and constrained using tephra layers.

Roland T.P., Caseldine C.J., Charman D.J., Turney C.S.M., Amesbury M.J. (2014) - Was there a ‘4.2 ka event’ in Great Britain and Ireland? Evidence from the peatland record. *Quaternary Science Reviews* 83, 11-27.

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[Interactive Discussion](#)

[Discussion Paper](#)



Wanner H., Solomina O., Grosjean M., Ritz S.P., Jetel M. (2011) - Structure and origin of Holocene cold events. *Quaternary Science Reviews*, 30, 3109-3123.

In these last two papers is strongly challenged the idea that 4.2 event is a prominent signal in many part of the globe.

Magny M., Vanniere B., Zanchetta G., Fouache E., Touchias G., Petrika L., Coussot C., Walter-Simonnet A-V., Arnould F. 2009. Possible complexity of the climatic event around 4300-3800 cal. BP in the central and western Mediterranean. *The Holocene*, 19, 1-11.

Magny et al., 2009 showed that around 4.2 to 3.8 ka there is a succession of events in many Mediterranean record. Can the authors suggest some also for their record (e.g. some part more drier/wetter than the other?)

Minor point along the text.

Like Pag. 2732 when for the first time a species is quoted this must be completely reported

Pag. 2736 lines 5-10. It is unclear to me, looking also at table 1 why in the interval between 4900 and 4200 the error is so high.

Suggestions: Calcite precipitation out of equilibrium: the data reported to sustain deposition out of equilibrium are probably convincing, then the authors should convince the reader that the climatic signal is preserved. In this case a good argument is that the record is replicated in two different stalagmites?

Pag. 2740 lines 18-20. "Thus the current climate in N-Algeria appears to be within....." This sentence is not very clear and probably wrong. Isotopic composition of modern calcite is too low compared to GLD1-stm4.

Pag. 2741 line 22 flowstone instead of flow stone. Pag. 2742 line 26 4400 Pag. 2743. Line 10-11 It is unclear the reference to Irish stalagmite, please adds citation

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Discussion Paper



and eventually insert the curve in some figure. Note that several archives seems to suggest that 4.2 event is not evident at northern latitudes (see reference suggested).

Overall I think that the manuscript needs moderate revision before final acceptance. It is important to discuss in more detail available literature in the central Mediterranean and to consider other quotations which suggest (and may support) the view that this event is not strongly represented in the N. Atlantic region as correctly stated by the authors.

Sincerely

Gianni Zanchetta

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Interactive comment on Clim. Past Discuss., 11, 2729, 2015.

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