

Interactive comment on “Holocene aridification trend interrupted by millennial- and centennial-scale climate fluctuations from a new sedimentary record from Padul (Sierra Nevada, southern Iberian Peninsula)” by María J. Ramos-Román et al.

Anonymous Referee #2

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This manuscript is quite interesting, bringing lights on a period not yet explored in this notorious site and worthy to be published. Nevertheless I suspect the authors to partly over-interpret their datasets in order to demonstrate that they confirm a model of late-Holocene climate changes identified in other western Mediterranean sites (reinforcement syndrom). Here are my remarks along the text

1/ Study site: the information on the geological context (lines: 127-133) could be (at

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least partly) presented before the short description of the regional vegetation. The description of the “vegetation in the Padul area” (line 194) seems to concern potential vegetation as, looking on “google earth” I observe that the surrounding of the site is on large almost totally cultivated: this agricultural activity (and maybe its historical) could be described. Concerning the vegetation on and around the lake, the floristic list, is a description of different assemblages possible? One of them could constitute a modern analogue to the pollen spectra in PAZ 3 and 4a? A paper by Pons and Reille (1988) mentions a peat exploitation: It would be of interest to know the connection between this exploitation and its potential impact on the lake beside the coring point.

2/ line 218: Lycopodium tablets are mentioned here but the changes in pollen concentrations not discussed later? It would be of interest to know if the transition from unit 1 to Unit 2 is marked by a major change in pollen concentrations?

3/ line 220 : It would be of interest to mention the state of preservation of the pollen grains as far as some authors (Bottema) suggested that a high amount of the very resistant grains of Cichorioideae could be due to a differential destruction of pollen grains.

4/ line 269 (fig. 4). It would be of interest to recall the lithology beside the pollen zones (even if the scale refers to ages).

5/ Line 288: this increase in Mediterranean forest types is far to be evident!

6/ lake level, lines 322-331: At a time when human impact is evident together with a high minerogenic influx it is difficult to decide if it is a lake level lowering or simply an infilling.

7/ discussion p.9, line 58-360: it could simply mean that Bothryococcus greatly suffers in ephemeral lakes Line 373: clastic input could simply be linked with increasing land use in the catchment leading to more active erosion!

Line 377: it would be of interest to connect this evidence with local historical and

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archaeological data on the land use around the site across time.

Line 492: this increase in *Bothryococcus* starts quite at least 500 years before the beginning of IRHP: the argument is faint.

Line 506 : Cichorioideae! First try to identify the ecosystem (or the disturbance) which generates this incredible amount of Cichorioideae!

Line 603: I am not a statistician but I am afraid by this suggestion of periodicity bases on honest but rather low pollen and algae counts (260 terrestrial).

Line 618: human impact; my feeling is that a part of the information provided here could be included in the initial presentation of the site.

Conclusion: A further study on the micro charcoal could trace the rhythms in aridification (or land-use). I invite the authors to clarify some elements of their demonstration.

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