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Climate of the Past Discussions

Interactive comment on "Holocene hydroclimate reconstruction based on pollen, XRF, and grain-size analysis and its implications for past societies of the Korean Peninsula" *by* Jinheum Park et al.

Anonymous Referee #2

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1. General comments: The authors present multiple geochemical proxies data from a floodplain sedimentary core in Miryang, Korea. High resolution pollen, gran size, and XRF-scanning data show clear oscillation during the past ∼8 kyrs.

Although authors would like to reconstruct the paleoclimate conditions in this region and to discuss the climatic controlling factors and how human societies response to climate changes, there are some questions need to be clarified.

2. Questions need to be clarified: Line 40, authors should clarify why the methodology

of pollen studies could not increase temporal resolution and what kind of resolution they would like to achieve (1-yr? 10-yr?). Temporal resolution is a relative concept and there are other factors need to be considered. If there has strong mixing or bioturbation, then even we could use few micrometer resolution to scan sediment core with XRF-scanner, it is still meaningless to claim the data we get has higher temporal resolution.

Line 49, author mentioned the relationship between climate change and human societies, but to specific, which part of human societies? Do authors mean the resilience of human societies, the limitation factors from climate changes, the total population changes, the food availability?

Line 73, do authors suggest we could explain the whole Korean Peninsula climate change with a single site and the whole peninsula population changes as well?

Line 77, authors mentioned this sedimentary core is derived from a floodplain, but authors did not provide clear evidence how sediments had been transported to here (by occasional flood? Or the main path of river had changed many times through time? Or it is a terrace that had been uplifted?). This is very important especially when authors would like to explain the grain size change to reconstruct climate changes in the past. If we don't know how sediment had been transported to here, then it is very dangerous to treat authors pollen and XRF-scanning as an in-situ signals.

Line 91, authors described modern forest species, but is it possible that author authors could provide surface soil pollen as a modern control to confirm that the modern assemblage of vegetation is similar to the pollen composition as well?

Line 100-103, why authors could identify the uppermost and the lowermost of sediment core are affected by human activities? Please provide clear evidence (pictures?) and explain why there is no human activities during their study period.

Line 109-110, why these two 14C dates are omitted? Why these 2 dates have anomalous ages? Please explain.

Line 160, similar to line 77, where does the Ti come from? In Lines 185-188, authors claim they interpret Ti signal as a reflection change in the “Korean Peninsula”. But there are no references to support their interpretations.

Furthermore, Ti does not “follow” the insolation changes, at least by my naked eyes. Authors could argue there is a clear increasing $\sim$4.8 to 3.8-kyr, but the variabilities during 8-5 kyr show rather centennial oscillation than gradual shifting.

Finally, in lines 229-237, authors would like to connect their records to broad regional forcings, such as ITCZ, ENSO, and Kuroshio strength, however, they could not provide good interpretation to explain the differences between their records to other records with in the peninsula.

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