TEKTONIKA

Review Report

Lacassin et al., The antique Sparta Earthquake (Peloponnesus, Greece) and Limestone Scarps on Active Faults: a Field Guide**, TEKTONIKA, 2026.**

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1st Round of Revisions

Decision letter

Robin Lacassin, Yann Klinger, Nathalie Feuillet, Jean Bernard de Chabalier, Spyros Liakopoulos:

We have reached a decision regarding your submission to τεκτονικα, "The antique Sparta earthquake (Peloponnesus, Greece) and limestone scarps on active faults: a field guide".

Our decision is: Revisions Required

Sorry for the delay in getting this returned Robin. I have now sourced two reviews that are very complementary and, I think, self-explanatory in their suggestions. Both recommend some minor revisions, principally focused on adding more field photos / potential other sites. I think these suggestions will really help finish off the guide. Without having been to this area, I found the guide very informative and suspect I could follow it easily enough in teh field, so I have nothing to add that the reviewers haven't already covered.

Kind regards,

Craig

Comments by Reviewer A (Christoph Grutzner) and author response

This submission is not a research paper, but an extended field trip guide. The target is the Sparta Fault scarp, a very important, almost iconic site in the history of active tectonics research in the Mediterranean. Here, important concepts were developed that are now applied across the world, and pioneering work on scarp dating was conducted. It is a site that many, many students have visited during excursions. The site is great because it combines relatively easy access, tectonic importance, historical importance, well- studied geology, multi-scale observations with the most beautiful landscape.

In this manuscript, the authors first summarize the main scientific story and the history of scientific research. They then provide detailed instructions on how to approach this story both from a logistical point of view and a pedagogical perspective. I have visited the site myself and I found the manuscript in very good shape. It's clear, concise, useful, correct, and well-illustrated. It is actually a very pleasant read. The supplement information is useful for navigation.

I would be happy to see this published. In the annotated PDF I recommend very few, very minor corrections, most of which can easily be done in a few minutes.

Suggested changes have been implemented in the manuscript. As suggested by the reviewer in their notes, we now end the paper with the following sentence: The same progressive approach in the field – ranging from large-scale landscape analysis to metric-scale scarp investigation – coupled with a discussion of these observations and their implications, could very likely be applied to other geographical contexts, such as the numerous active normal faults of the Apennines in Italy.

I recommend adding another topographic profile that shows the concave upper part of the Taygetus, because I think it will help the students to "read" a tectonically active landscape. In the same profile one could show how the slope of the facets changes 20° to ~40°.

As suggested by the reviewer, we added another topographic profile (now Figure 4b) illustrating the lower step topography and the local slopes of the imbricated facets along this representative profile. We have modified the text accordingly: Armijo et al. (1991) have identified three sets of imbricated facets characterized by average slopes of ~40°, 30° and 20°, which collectively define the convex topography of the spur. A representative topographic profile across such a convex spur is illustrated in Figure 4b. We do not believe it necessary to add a separate profile for the upper part of the relief, as its shape is well illustrated in the general profile of Figure 4a. We have simply added the label "upper concave topography" to outline that shape on the figure.

I also recommend adding another photo plate, showing the 36Cl sampling trace and a close-up of the fault plane to show corrugations, striations, and perhaps slickensides. For a field trip guide, more photos are always good.

We added a photo of the scarp on which the 36Cl sampling traces are visible (now Figure 8c). We are not including a close-up view of the scarp because the rare

slickensides or other microstructures are not easily visible on photographs. Such a photo would not add much value. We have moved the photo of the conglomerate wedge to a separate figure (new Figure 9) and added another view of such wedges. We also took the opportunity to add two hand-drawn sketches extracted from the field sketchbook we are using to teach during field excursion (new Figure 6). This example demonstrates, and may assist students in understanding, how hand-drawn field notes can be effectively taken during fieldwork.

Now having praised this manuscript, I wonder if tektonika actually publishes field trip guides. This is an editorial decision that I can not make. If yes – great, this is a very good manuscript. If no – reject, there is no scientific novelty.

Field guides are one of the four article types Tektonika aims to publish (https://tektonika.online/index.php/ home/manuscript_guidelines)

Comments by Reviewer B (Klaus Reicherter)

First of all, I am very sorry for the delay. Basically there are only some formal issues, correct citation, and a blank between e.g. meters or ages, like 10 m, 464 BCE. I know the area quite well as we are working there also since 15 years or so. It´s a nice format, and worth to be published. I have add my notes in the ms.

We have implemented all minor corrections suggested by the reviewer in the ms. In their notes, the reviewer has suggested adding additional references to support the conclusion that, based on 36Cl dating, scarps formed after the late glacial maximum (LGM). They listed a few author's names – Robertson, Mitchell, Roberts, etc – without suggesting precise references. We have reviewed several recently published studies by these authors and others, which prompted us to include a few additional references (Mechernich et al. 2018, Goodall et al 2021, etc…). We also took the opportunity to clarify that some scarps at low altitudes or latitudes may, in certain cases, predate the Holocene, though they remain predominantly post-Last Glacial Maximum (LGM) in age (citing Mechernich et al. 2023; Mitchell et al. 2025). Our revised text is: This implies that most of the limestone scarps observed in the field are post late glacial maximum (LGM), basically Holocene, in age. Cosmogenic dating results in Sparta (Benedetti et al. 2002, Goodfellow et al. 2004) support this interpretation, as the top of the scarp dates from the early Holocene. Similar conclusions have been reached for multiple limestone scarps in Italy and Greece (e.g. Palumbo et al. 2004, Roberts and Michetti 2004, Benedetti et al. 2013, Mechernich et al. 2018, Goodall et al. 2021). We note however that some scarps at low altitudes or latitudes may, in certain cases, predate the Holocene, though they remain predominantly post-LGM in age (e.g. Mechernich et al. 2023; Mitchell et al. 2025).

And a kmz file with some additional outcrops we visit there during excursions. Sparta free face 1, N 37.057981°, E 22.387690° Sparta free face 2, plus spring, N 37.062254°, E 22.382259° this is a nice one!

We agree with the reviewer that these locations and outcrops are indeed noteworthy (in fact we know these sites). However, given our objective to present a concise and linear field excursion, progressing from landscape-scale observations to the decametric scarp, we opted not to incorporate additional stops into the main itinerary; but we have included the suggested sites in the supplementary KML file and added a footnote in the text to point to these supplementary locations.

Lastly, and I think it wasn´t that clear from the introduction: to my knowledge the riots and revolution of the Helots against the Hoplites after the earthquake is extraordinary,

usually during crisis and natural catastrophes societies get closer and help each other. I use the example in my lectures as (failed) attempt to change the political system. So, with the exception of the 1970 Bangladesh cyclones and flood which lead to a new country formerly East-Pakistan, I don´t remember any political changes. Besides the 464 BCE attempt. Remarkable! Maybe you know? So, maybe the authors can focus a bit on that, which makes - besides the geology and tectonics - the Sparta Fault a bit more exceptional.

We concur with the reviewer regarding the extraordinary nature of the Sparta earthquake. However, addressing in more detail all the points raised by the reviewer would warrant a separate study (mostly political / historical) supported by several references. It would exceed the scope of our introduction, which must remain focused on the objectives of the proposed field excursion. Nevertheless, we have incorporated the following sentence in the first paragraph to underscore the earthquake's exceptional nature and consequences: This antique earthquake is exceptional because of its important political repercussions: it triggered a revolt against Spartan rule, significantly weakened Sparta's power for a decade or more, and served as a trigger for the Third Messenian War (Cartledge, 2002).

I hope that is enough? Please let me know, I don´t need to be anonymous. beste Grüße/ best regards Klaus

Acceptance letter

Robin Lacassin, Yann Klinger, Nathalie Feuillet, Jean Bernard de Chabalier, Spyros Liakopoulos:

We have reached a decision regarding your submission to τεκτονικα, "The antique Sparta earthquake (Peloponnesus, Greece) and limestone scarps on active faults: a field guide"

Our decision is to: Accept Submission