A newly discovered isolated Pelarda Fm. deposit: maps and photographs

The Ermita de San Roque deposit

Near the Aldehuela de Liestos village on top of a distinct hill emerging roughly 100 m from the plain, a peculiar deposit is observed to overlay Eocene (Oligocene) sediments (according to the geological map; Figs. 2, 3). The 5 m thick deposit bears all aspects of the Pelarda Fm. as shown in the images below. The deposit is composed of uncemented, very badly sorted, mostly (more than 95 %) Paleozoic material with well-rounded, subrounded and angular clasts. The main mass is Armorican quartzite, and a few Cretaceous/Jurassic limestone boulders are intermixed. Bámbola quartzite like in our classic Pelarda Fm. deposit is not observed.

Typical deformations occur in the form of spallation fractures; Hertzian fracture cones, dinstinct small impact craters and squeezed cobbles.

The deposit is found right in the middle of Mesozoic and Cenozoic sediments; Palezoic is not exposed within a radius of 10 km at least. On cursory inspection, no quartzite blocks of the size of the San Roque deposit have been observed in the plains around the hill.

Conclusion: The San Roque deposit with all aspects of the Pelarda Fm. is suggested to be also ejecta of the Azuara impact event that survived erosion. Alternative explanations for the deposition are giving serious difficulties.

The considerable distance of about 30 - 40 km to the Azuara/Rubileos de la Cérida rims is not a problem at all comparing the figures with the Ries crater ejecta that in the form of limestone blocks (so-called Reuter blocks) can be found up to 60 km distance. In one case one has found a several tons big strongly shattered limestone block in a gravel quarry about 150 km (!) distant from the Ries crater. This block is also interpreted as ejecta although also an origin from Miocene volcanism has been discussed despite the complete lack of any volcanic concomitant material (typically geologists' view ...). As for these distal ejecta we must not forget that the Ries is much smaller than Azuara/Rubielos. Possibly in both cases the large ejecta distances may be explained by the spall plate mechanism! And possibly (probably?) on more detailed field work we would find more of such deposits.

Fig. 1. Location map for the deposits at Aldehuela de Liestos (Ermita de San Roque) and near Almohaja.
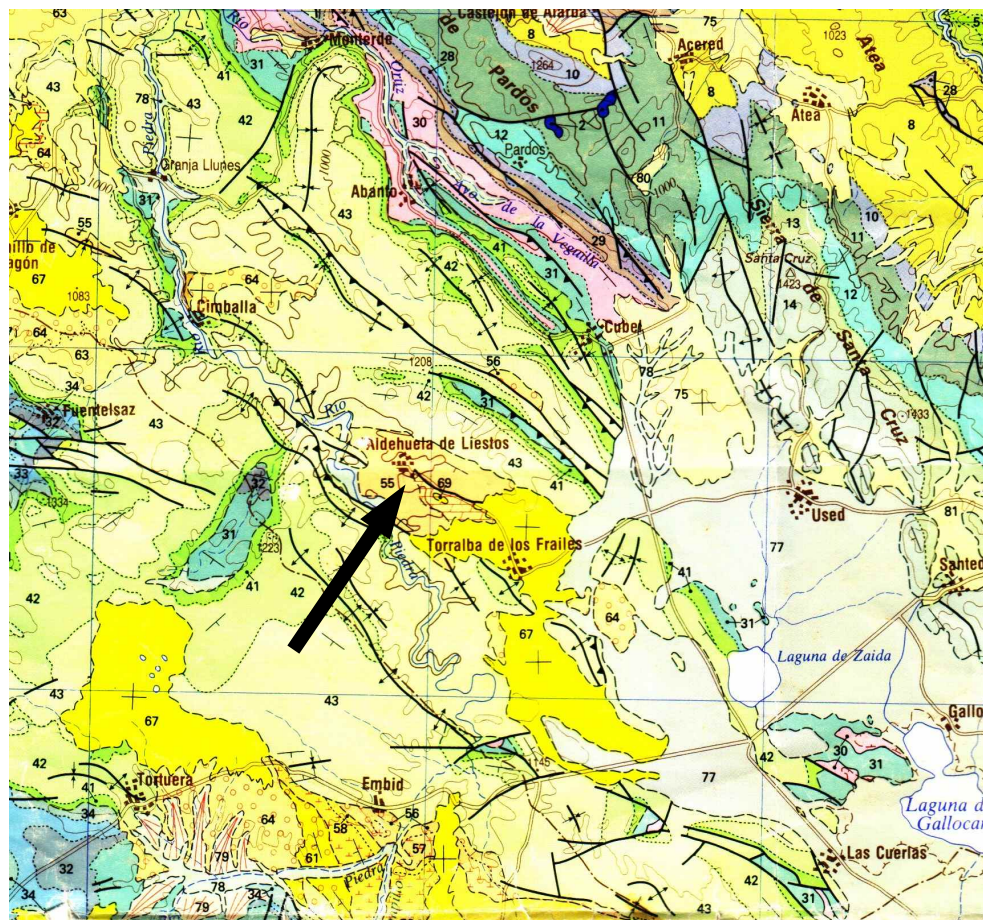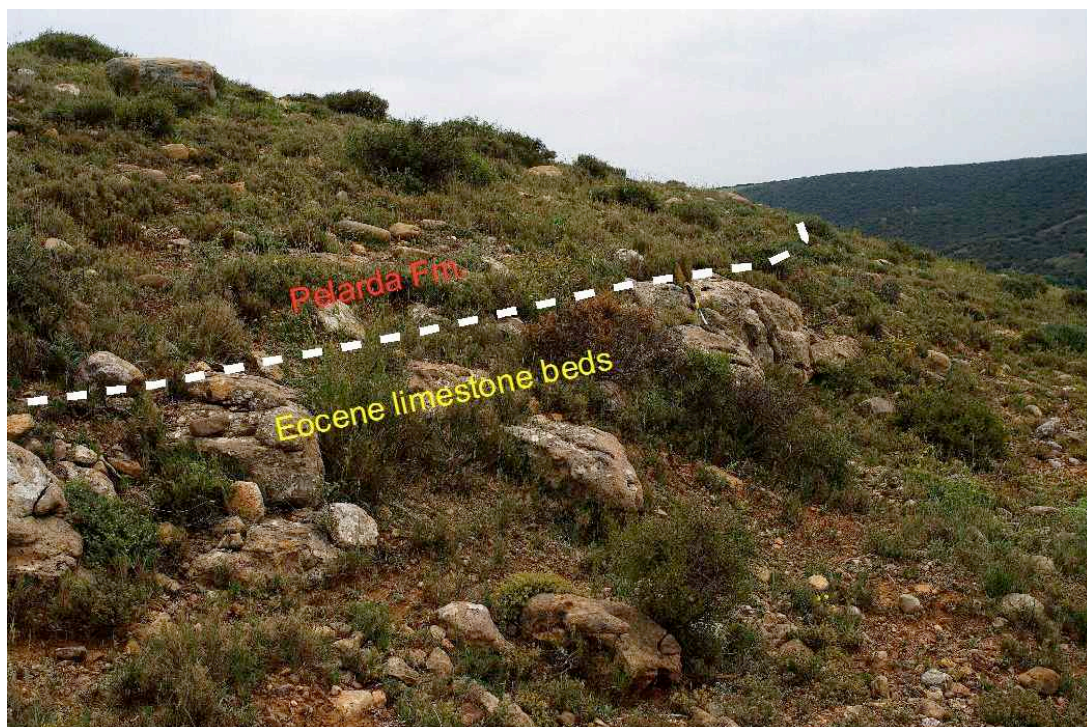

Fig. 2. Geological map of the Ermita San Roque (arrow) area.

Fig. 3. The Ermita de San Roque hill and the geological situation of the Pelarda Fm. deposit. Google Earth oblique view.

In the following typical images taken on the Ermita de San Roque hill:

Fig. 4. Pelarda Fm. deposits over autochthonous Eocene limestone beds.

Fig. 5. Closer view of the contact.

Fig. 6. View down from the outcropping Eocene limestone beds (lower left corner) to the southwest. The large blocks are Armorican quartzite. Note that downhill the blocks rarefy.

Fig. 7. Aspect of the outcropping Pelarda Fm. The hammer is lying on one of the rare Jurassic/Cretaceous limestone blocks. The outcrop wall is about 3 - 4 m.
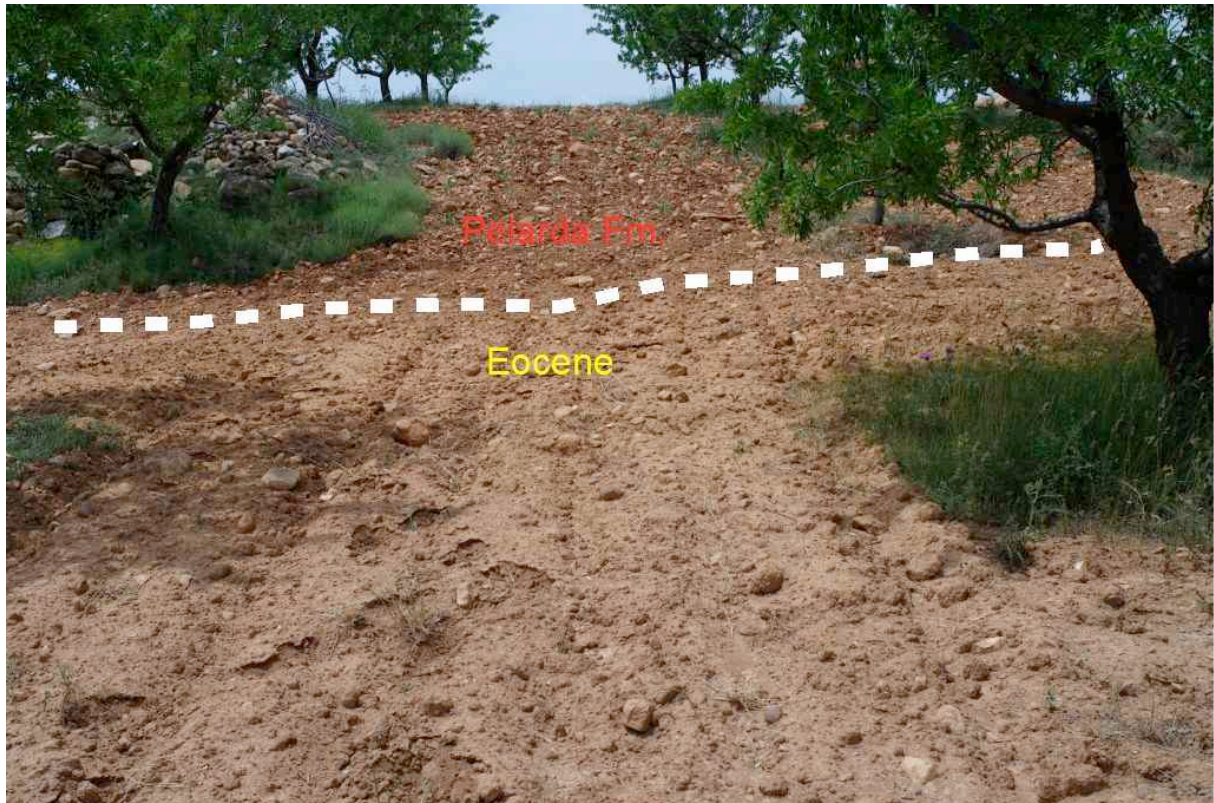
Fig. 8. Aspect of the P.F. in the field.

Fig. 9. Aspect of the P.F. in the field. The larger blocks have obviously been removed by the farmer.

Fig. 10. Mapping the Eocene - Pelarda Fm. boundary in the field.

Fig. 11. Assemblage of Pelarda Fm. clasts. To the right of hammer: Jurassic/Cretaceous limestone boulder. The lowermost quartzite clast shows distinct (?spallation) fractures.

Fig. 12. Large Armorican quartzite block exhibiting irregular fracture and ?spallation features.

Fig. 13. More ?spallation fractures.

Fig. 14. Strongly squeezed however coherent quartzite cobble.

Fig. 15. Large quartzite block with distinct concussion marks. Close-up in Fig. 16.

Fig. 16. Close-up of concussion mark with Hertzian fracture cone - arrow head in the center.

Fig. 17. Concussion (spallation) crater in a quartzite block.

Fig. 18. Ermita San Roque built of impact ejecta (except for door and window curbs).