

***Interactive comment on* “Location of the River Euphrates in the Late Miocene; dating of terrace gravel at Shireen, Syria” by T. Demir et al.**

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General comments:

1. A main value of the paper is that it gives new age control on the early history (since 9 million years ago) and evolution of a main drainage system. Often our records of fluvial evolution start only in the Pleistocene or late Pliocene (see also 2.).
2. The scientific objective of the research (and the publication) is not clearly outlined (which is really required). Is it the aim to reconstruct a former, and very old, course of a major river system like the Euphrates? If yes, it is OK to me, but take care that this study has more than a purely regional significance. The main value in this option should be, in my opinion, to demonstrate the considerable changes in drainage patterns that

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may have occurred since Miocene times, relative to the mostly moderate changes that are reported from the Pleistocene (see 1). In that case you should NOT deal with a derivation and conclusion about regional tectonic uplift (last paragraph) which is very cryptic and hypothetical, and I suggest removing the last paragraph.

If it is instead your aim to reconstruct the uplift rate, you should give much more attention to the calculation of this rate and especially discuss the reliability of your arguments (which is not done now in your last paragraph). In that option the value of the paper would be the warning not to use solely amounts of river incision to derive uplift rates without considering the complete geomorphological context. See 4.

3. Anyway, the reliability of the datings is crucial, in particular the ages of the two terraces (0.9 Ma and 9Ma). Since the 9Ma dating is new it should be discussed in more detail (method, comparison with other similar datings) to give the reader an idea of the reliability of the age of the terrace. The only (factual) information is now in fig 5 and its caption: this is too meager while still discussion is missing.

4. Last paragraph before Conclusions:

-On what arguments are the correlations based to attribute the +60 m terrace to MIS 12 and the +110 m terrace to MIS22?

-How reliable is it to correlate the +110 m terrace in SE Turkey with the +60 m terrace around Shireen?

-The attribution of the incision between the 2 terraces at Shireen to local downwarping along a fault is a 'free' hypothesis if no arguments are given.

The last sentence 'Maintaining a typical downstream channel gradient of 0.3m/km, the 800 km of channel-lengthening would mean that incision underestimated the contemporaneous regional uplift by 240 m.' needs really much more explanation (remembering that the coastline at 9 Ma was nearby (at Raqqa) in contrast to the coastline at 0.9 Ma which was 800 km further southward). This principle, however, needs serious discus-

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sion as shown here below:

-The attribution of the incision between the 2 terraces at Shireen to 'dramatic channel lengthening' is very questionable in my opinion without any additional information. Indeed whether channel lengthening could be responsible for any change in river longitudinal gradient depends entirely on the gradient of that added part of the river: if that latter gradient is lower than the upstream gradient, the upstream river will aggrade and the upstream gradient will become lower; if, on the other hand, the gradient of the added (downstream) part of the river is steeper than the upstream gradient, the upstream part will incise. In the first case the incision rate between 2 terraces would diminish, in the second case the incision rate would increase.

Specific comments:

-I suggest constructing the Introduction more systematically. Now a series of facts are given without any logical order (at least not immediately visible to the reader). The Introduction should also work towards the general aim of the paper (see 2.).

-Caption of fig. 1: avoid describing the geographical position of the coastline by drawing a line on the figure.

Technical comment:

Figure 1 is too fuzzy as it is overloaded with information. I suggest removing unnecessary (not used) location names, and to split this figure in two new figures at different scales. The first figure should cover a somewhat larger region and give mainly the general situation (probably also including the former coast lines), the second one can focus more to the changes in drainage pattern.

CONCLUSION

The material and results that are presented are certainly within the scope of the journal.

Title, abstract, reference list are OK.

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When credit is given to above remarks I think this is a very good paper that I suggest to accept for publication.

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