

Discussion

Comment on: “Uplift and contractional deformation along a segmented strike-slip fault system: the Gargano Promontory, southern Italy”

by C.M. Brankman and A. Aydin

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Brankman and Aydin (2004) propose a model to explain the anomalous elevation and position of the Gargano Promontory (Southern Italy). The model in itself is absolutely consistent but is not supported by the data and is thus not really relevant for the Gargano Promontory. On the contrary, the model is often in apparent contradiction with available information. It is unfortunate that Brankman and Aydin (2004) disregard a substantial body of literature and thus reach conclusions that are not compatible with the observations.

The basic idea of the paper is that the elevated position of the Gargano Promontory is related to a contractional step-over between two sinistral, E–W-trending faults. Obviously, the main ‘field’ ingredient of such a model are the two faults. Unfortunately they are not there; at least not where they are needed. Getting in some more detail and referring to Fig. 2 of Brankman and Aydin (2004), the following comments must be made.

Although not stated clearly, one gathers from Fig. 2 that the fault forming the southern rail of the system is the Mattinata fault. Some observations are here relevant:

- the Mattinata fault is well inside the elevated portion of the Gargano Promontory and it does not correspond to the first order change in the dip of sedimentary layers which is located a few kilometers to the south (see Fig. 4

in Bertotti et al., 1999). The statement of the authors that “...the Mattinata fault, which is located along the southern margin of the Gargano uplift” is therefore not correct.

- The statement of the authors that “There is no evidence for the continuation of the Mattinata fault to the west; rather the fault appears to terminate at the southwestern corner of the of the uplifted block” disregards available observations and is therefore incorrect. Chilovi et al. (2000), using a large body of seismic data, demonstrate that the Mattinata fault does have a continuation to the W under the Apennine foredeep. The reason for the ‘disappearance’ of the Mattinata fault is simply that it is covered by Plio-Quaternary sediments. Also for this reason, the Mattinata Fault cannot be the southern ‘rail’ of the system.

The *northern rail* of the strike-slip system is also missing. Inspection of Fig. 2 of Brankman and Aydin (2004) provides no clue as to the position of such an allegedly important fault. Some continuous lines (unspecified faults) are indicated south of Lago di Varano. In reality (see detailed geological sections in Casolari et al. (2000) and Bertotti et al. (1999)), the indicated structures are SW-vergent thrusts. No strike-slip fault is visible in the field. No strike-slip fault is visible in the seismic north of the Gargano Promontory either (Bertotti et al., 2001).

Several additional statements contained in the article by Brankman and Aydin (2004) are incorrect:

- “The Rignano fault (see Fig. 2) is ...not a fault”. The

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morphological cliffs (*sharp break in slope* according to the wording of Brankman and Aydin (2004)) correspond to the steep flank of a S-vergent fold (see geological sections in Bertotti et al., 1999).

- The statement that “bedding is especially disrupted and/or dips steeply in the vicinity of faults” is in fact the product of circular reasoning. Brankman and Aydin (2004) have placed the faults there where layers are steep, but without detailed field observation. The steepest beds are encountered N of the Mattinata fault and N of what the authors call the Rignano fault. In both cases, the steep position of sedimentary layers is associated with folding. Faulting is not instrumental for their position.
- That “the NW-trending lineaments ... have been mapped... but not documented in detail” reflects the insufficient knowledge of the authors rather than the reality. We refer to Bertotti et al. (1999) and references therein.
- Contrary to what is stated by the authors *these contractional structures are* not in contrast with the remainder of the Apulian platform, which shows predominantly extensional features. Folding (although of a magnitude smaller than that observed in the Gargano) is reported in several publications.
- The statement “Determination of the timing and duration of the uplift deformation... is difficult due to the lack of correlatable stratigraphy across the major strike-slip faults and the lack of younger deposits to constrain the end of deformation” demonstrates the disregard of existing data. Tertiary sediments have been mapped in the official sheets 1:100,000 of the Geological Map of Italy and have been recently carefully described and interpreted by Bertotti et al. (1999) and Casolari et al. (2000).

From the above we conclude that the basic statement of the paper of Brankman and Aydin (2004), namely that “The Gargano block is bounded on the northern and southern margins by E–W striking strike-slip faults” is in contrast with observations.

Having started working in the Gargano only at a late stage ourselves, we are obviously in favor of having geologists from distant regions working on the area. An attentive and exhaustive consideration of the available literature is, however, required. Brankman and Aydin (2004) have disregarded some important papers published on widely accessible journals and this has led them to interpretation mistakes of the first order. We regret this very much especially for the high respect we have for the senior author of the paper.

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