

THE GACHIN FAULT ZONE AS THE MAIN CAUSE OF THE RECENT DEFORMATIONS ON THE SEDIMENTARY COVER AND THE 2014 MAY 27 EARTHQUAKE IN THE SOUTH OF QESHM ISLAND

Zeinab DAVOODI

Assistant Professor, Imam Khomeini International University, Qazvin, Iran
davoodi.zeinab@gmail.com

Keywords: Gachin Fault, Recent Deformation, Sedimentary Cover, Earthquake, Qeshm Island

The Zagros Fold-Thrust Belt is one of the youngest mountain belts, located in the middle part of the Alpine mountain system. The NW-SE trending belt developed during the collisional stage between the Arabian Plate and Central Iran in the late Cretaceous. The major structures of the belt, Thrust faults and related folds, are transversely cross cut by two sets of subsurface fault zones developed during the late Alpine Zagros orogeny. The first set oriented NNW-SSE shows right-lateral strike-slip movement and the second set, NE-SW oriented, has left lateral strike-slip movement.

The SE of Zagros belt (Bandar Abbas area) is dominated by the left-lateral strike-slip faults that are detected by Furst (1990) and are named with numbers on the Figure 1A. In this article we believed that the Gachin Left-lateral strike-slip fault zone trending N-030 (Figure 1B and No. 15 on the Figure 1A) is the main cause of the recent deformations on the Quaternary sediments in the Qeshm Island and Surrounding areas based on the field, remote sensing and sismotectonics studies.

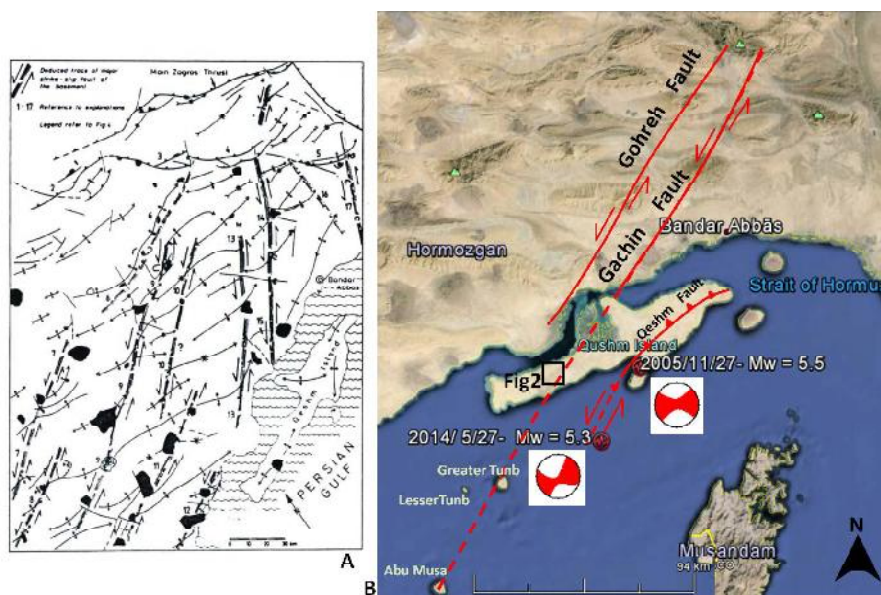


Figure 1. A) The left-lateral strike-slip faults in the Bandar Abbas area (Furst, 1990). B) The satellite image of the study area shows Gachin fault (No. 15 on A), Gohreh fault (No. 13 on A), Qeshm fault and location and focal mechanism of 2005/11/27 and 2014/5/27 earthquakes

Remote sensing studies of the satellite images along the fault zone show presence of structures such as curvilinear geometry of the faults and fold axial traces and Salt dome outcrops. Other significant structures such as minor folds and faults can only be mapped at field. These minor structures can be recognized on Quaternary sediments in Qeshm Island (Figure 2).

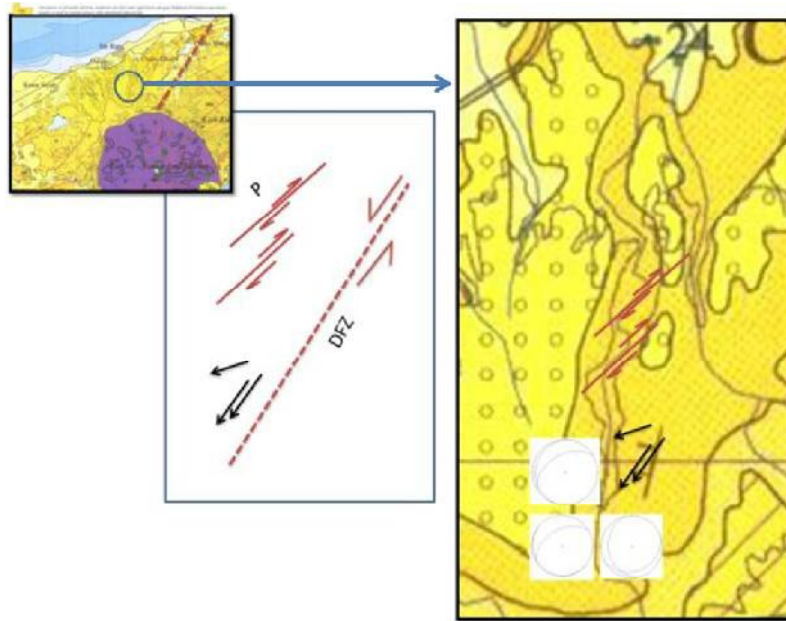


Figure 2. The structural map of some minor folds and faults on the Quaternary sediments of Qeshm Island along the Gachin fault zone. The position of this figure shows on the Figure 1B. DFZ: Gachin Deformation Fault Zone

The activities of Gachin fault zone are continuing to present time. This can be constrained by epicentral locations of few earthquakes occurred with left-lateral focal mechanism parallel to the Gachin fault zone especially the 2005 November 27 and 2014 May 27 earthquakes (Figure 1A). The epicenter of these earthquakes and their aftershocks are along a curved line as a continuation of the Qeshm reverse fault with strong left-lateral component to the south (Figure 1A). So the Qeshm fault trace shows a left-lateral bending on figure 1A because of the reactivation of Gachin fault zone.

The Gachin Strike-slip fault continues to the SW of the fault No. 15 (Figure 1) toward the Abu Musa salt dome. It can be concluded that, reactivation of this fault is the main cause of 2005/11/27 and 2014/5/27 earthquakes in the area. Migration of the earthquakes to the SW shows that the present activities at the Gachin fault southern parts are greater than its northern portion.

The northeastward movement of the Arabian Plate towards Central Iran is in favour for the reactivation of Gachin fault zone. Therefore, it is proposed that such convergence can account for the reactivation of similar fault zones in the Zagros Fold-Thrust Belt like Izeh fault zone (Davoodi and Yassaghi, 2009).

REFERENCES

- Davoodi Z and Yassaghi A (2009) Syn- to post-collision role of Izeh transverse fault zone in deformation of the Zagros fold-thrust belt, *Journal of Trabajos de Geología*, 29: 206-212
- Furst M (1990) Strike-slip faults and diapirism of the South-Eastern Zagros ranges, *Proceedings in symposium of diapirism, Bandar Abbas, Hormozgan, Iran*, 2: 149-181

