

Tectonically controlled facies change at the transition from the Hajir Formation to the Muaydin Formation: extensional, syndepositional faulting (Ediacaran, Jabal Akhdar Dome, Eastern Oman Mountains)

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In the center of the Jabal Akhdar Dome, an irregular horst, made up of Hajir Formation carbonates, is bounded on both sides by syndepositional extensional faults. The western fault dips to the SSW. It is an extensional growth fault, associated with rollover anticline and syncline within syndepositional siliciclastic layers of the Muaydin Formation. Increasing thickness of the involved strata towards the fault indicates syndepositional extension. The fault is blanketed by postdeformational Muaydin clastics. The eastern fault dips to the ESE. It is possibly an inverted extensional fault. A definite extensional fault interval was possibly followed by an episode of contraction. The eastern fault is also blanketed by postdeformational Muaydin siliciclastics. The uncertain contraction at the eastern fault may have coincided with extension along the western fault as the strike angles of both faults differ relatively close to 90°. The eastern fault may provide a clue regarding similar Ediacaran movements along the parallel, NNE-striking Proto-Semail Gap. Ediacaran vertical block movements along the Proto-Semail Gap can explain why the Muaydin Formation is present in the Jabal Akhdar Dome in the west but absent in the easterly located Saih Hatat Dome. The tectonic setting is principally marked by WNW-ESE-oriented extension. Immediately west of the irregular horst, a seemingly complete stratigraphic transition from the Hajir Formation to the Muaydin Formation is present. On top of this irregular horst is a minor stratigraphic gap at the contact of both formations. Despite the fact that the observed features are all outcrop-scale phenomena they provide insights into the larger scale Ediacaran tectonic and depositional setting, which caused complete and incomplete stratigraphies, lively deformation as well as common slumps (in the lower part of the Muaydin Formation). Syndepositional extension is responsible for the abrupt change from carbonate to siliciclastic facies as deformation created new relief and surfaces which were eroded and shed siliciclastic sediments.