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Paleokarst in the Saiq Formation (Saiq Plateau, Oman).

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The Saiq Plateau composite section of the Saiq Formation (Middle Permian-Lower Triassic) consists of a 725m thick succession of limestone and dolostone arranged in shallowing upward cycles (Kohrer et al., 2010). This Formation has been subdivided in three Members (A, B and C, Baud et al. in Baud and Bernecker, 2010) and contains four main transgressive-regressive cycles (3nd order T-R cycles). These three Members have been correlated to the Weidlich (2003) supersequences P2 to P4. They are also correlated with the following Kohrer et al. (2010) sequences: Member A with KS6-KS5, Member B with KS4-KS3, Member C (=lower part of the Mahil Formation in Kohrer et al., 2010) with KS2-KS1.

The Saiq Formation has been described earlier by Montenat et al. (1976) on the Saiq Plateau, with the determination of the Middle Permian foraminifera, calcareous algae, *incertae sedis*, bivalves, brachiopods, crinoids and bryozoans. Concerning the age, these authors have dated the lower part as the *Neoschwagerina schuberti* zone of Middle Murgabian, corresponding to a Wordian age. This is supported by the recent recovering of the conodonts *Hindeodus excavatus* and *Hindeodus wordensis* (Nicora et al., 2009) that ranges from mid-Roadian to Lower Capitanian (Wardlaw, 2000).

The lower part of the Saiq Formation (Member A, 350 m thick, corresponding to P2 in Weildlich and Bernecker, 2003) has been subdivided in 6 units from the base up:
the A1 unit is partly terrigenous (=the lower Saiq of Rabu, 1988). The carbonate deposition start with the unit A2 and limestone is the main lithology from unit A2 to A4 units (Fig. 1). The units A5 and A6 are mostly high-energy sandy dolostone.

A paleokarstic pocket (illustrated in Fig. 1) up to 2 m in diameter has been found in the lower part of the Saiq Formation, in the unit A4, about 145 m above the base of unit A2, in a small valley that is about 2 km East of the village of Hail Al Yaman. The lithology from units A2 to A4 consists of about a 150m thick pile of limestone that escape to late dolomitisation processes and with three shallowing upward transgressive sequences.

This pocket is filled up by poor sorted heterogeneous and angular lime clasts and rare rounded boulders up to 30 cm in diameter that record a local emersion of the shallow shelf.
About 10 m above (top of unit A4) occurs the dolomitisation front and the top of the first transgressive - regressive cycle corresponding to the Kohrer's KS6 sequence. We note also a concentration of iron oxides within these first dolomudstone levels.

During the last stage of continental distension, stretching paleotectonic and bloc tilting play an important role with large gaps and unconformities within the Saiq Formation as it has been shown recently by Chauvet et al., 2009 and by Weidlich and Bernecker, 2011, in the Saih Hatat region.
Until now they are few evidences in the Al Jabal al-Akhdar and on the Saiq Plateau areas of early tectonic activity. But erosional and exposure surfaces have been also illustrated by Baud et al. in Baud and Bernecker, (2010, Fig. 32) from Lower Triassic Member C of

the Saiq Formation, 500 m above the paleokarstic pocket. This two finding confirm than the Middle to Upper Permian and Lower Triassic Arabic carbonate plateform was tectonically active and that this tectonic activity should be more took into account interpreting the sequence stratigraphy of the Saiq Formation sequences.

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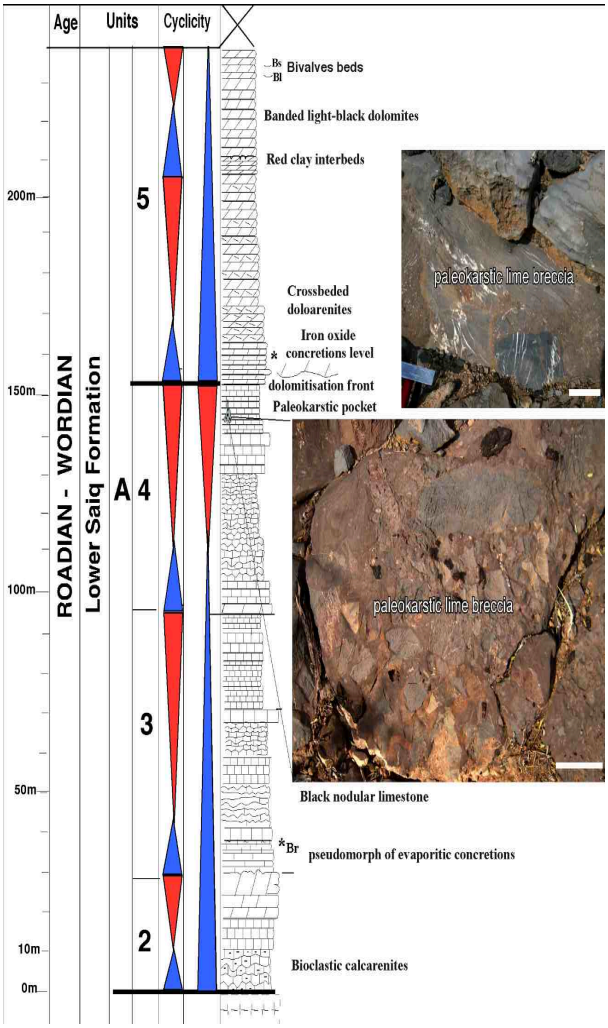

Figure 1: The Lower Saiq Formation on the Saiq Plateau (section East of the village of Hail Al Yaman with the 4 and 3nd order cycles with on the right 2 photos of the paleokarstic pocket Scale bar = 5 cm),