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Dolomitization in diagenetic history of the Štramberg limestones

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The Štramberg sequence is a part of tectonic megaslices detached from the reef complex which originally (Tithonian) had bordered the eastern slope of Bohemian Massif and later had been deposited as a shallow water mound limestone. A grey bedded dolomite occurred in some clefts of this tectonically deformed carbonate complex. Light and SEM microscopy study has been completed by the elemental (Sr, Na Mg, Ca, Mn, Fe) and C and O-isotopic analyses of calcite and dolomite to document sedimentary and diagenetic/burrial history of this sequence. Results indicated diagenetic dolomitization in equilibrium with "marine" fluids. The $\delta^{13}C$ (2.38 to 2.58‰) values exclude meteoric origin of the dolomitization fluids and the $\delta^{18}O$ (–3,58 to –4,34‰) exclude a hyper-saline origin and Sr and Na contents, comparable with the ambient reef-related limestone. Grain size (0.05÷0.2 mm) and idiotopic to hypidiotopic dolomite rhombs mosaic could indicate rather low-temperature (50÷60°C) diagenetic re-crystallization of low-Mg calcite which coincide with calculated $\delta^{18}O$-dolomite temperatures. Dolomite with the dark cores and increased Fe and Mn indicated diagenetic growth of crystals too. However, Fe content could be higher due to the occurrence of pyrite. Large part of grey bedded dolomite are re-crystallized to yellow-brown dedolomite. Subhedral to anhedral mosaics of new-formed calcite with low content of Mg and Sr and higher content of Fe, Mn and Na, decreased $\delta^{13}C$ (–0.01 to –1.72‰) and $\delta^{18}O$ (–5.73 to –6.36‰) data are documented. These results indicated late diagenetic changes more probable in deep burial than in the near-surface condition and meteoric water input. The phase analyses of the calcite and dolomite from an infilling of reef limestone fissure indicated different dolomitization history. More negative data in dolomite ($\delta^{13}C$ –0.88 to –0.11‰, $\delta^{18}O$ –4,12 to –7,94‰) and more positive

$\delta^{18}O$ in reef limestone (–1,92 to –0,53‰) indicate “syngenetic” dolomitization due to meteoric or saline water seepage into the reef. However, the dolomite is unstable mineral and its geochemical history could be easily re-set by re-crystallization. The dolomitization and dedolomitization timing must be reviewed taking into mind global and local sea level changes, local hydrologic regime, weathering and climate and complicated tectonic history of the studied klippen limestone.