SYNSEDIMENTARY TECTONICS AND MASS WASTING ALONG THE ALPINE MARGIN IN LIASSIC TIME

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An intriguing case study of drowning successions of huge Triassic carbonate platforms and synsedimentary block tectonics is exposed along the saw-cut wall sections of quarries around the village of Adnet close to Salzburg. The deeply submerged, inherited relief of a drowned reef mound gave rise to pronounced Liassic facies differentiation, i.e. (1) deposition of grey spiculitic cherty limestone and marl beds in the former shelf basin, and (2) red nodular limestones, and red condensed limestones rich in ammonites and Fe-Mn crusts over the slope and top of the former reef mound. Faulting, tilting and submarine erosion of Hettangian drift deposits at the lower slope was followed by repeated down-slope gliding, shearing and multiple opening of fissures with different generations of sediment infill. Renewed tectonics from Late Pliensbachian to Middle Toarcian created deep reaching vertical fissures and triggered multiple mass flow events. At the upper and middle slope the so-called Adnet Scheck breccia, which is a special debrite deeply eroding and incising into well-bedded condensed hemipelagic limestone strata, was deposited. Further down-slope the Scheck breccia evolves into more matrix-rich nodular breccias. Basin sections reveal intercalations of mudflow deposits and were affected by various magnitudes of sliding and mass flow events forming complex mass transport deposits. The down-slope transition of Scheck breccias into nodular breccias and finally into pebbly mudstones indicates a drastic change in the flow properties. Cohesive Scheck flows are limited in lateral and down-slope extent, whereas the turbulent pebbly mudstone flows reveal long run-out distances due to hydro-planning. Scoured debris tongues of Scheck type testify deep erosion. Our observations show that collapse of scour sidewalls is a new mechanism to explain enrichment of semi-consolidated sediment and lithified rock blocks at top of the flow. The main driving force in Scheck type flows is a thin muddy layer at the base, whereas the main body tends to freeze and pluck the flow.

References

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