3.2.4. Locality 7 – Steinplatte

The Steinplatte Mountain (Fig. 1), north of Waidring (Tirolic Alps) near the German-Austrian border, is located south of the Unken syncline. It forms the southern margin of the Eiberg intraplatform basin. The Steinplatte buildup consists of flat-lying platform carbonates of the Oberrhaet Limestone with a northwards inclined distally steepened ramp to finally slope margin (Fig. 5). An intact platform to basin transition allows the reconstruction of the Triassic margin architecture and a study of the onlap geometries of basal Jurassic formations (Figs. 29, 30). Oberrhaet Limestone that forms the main part of the buildup and the crest (Sonnenwände) interfingers to the NW with limestones (Kössen Formation, Eiberg Member) of the adjacent Eiberg Basin (near Kammerköhr Inn, Figs. 30, 31). Small separated mounds exposed at the base of the crest are interpreted as initial growth stages.

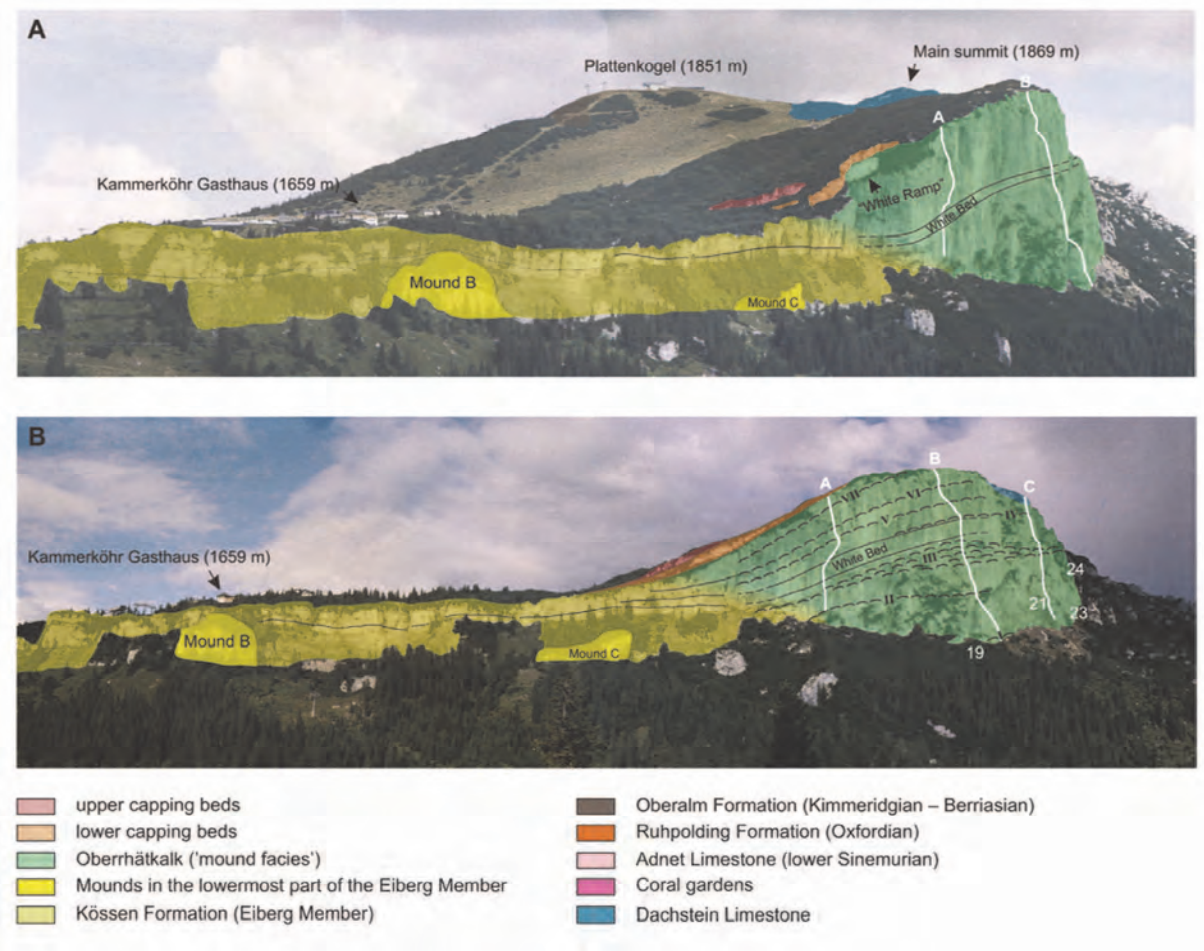

Fig. 29. The Steinplatte complex from two different perspectives. A) Looking ESE from near Brennhütte. B) Looking ENE from Grünwaldkopf. Flat-lying Kössen Beds (yellow) grade laterally into up to 36° ("White Ramp") inclined Oberrhätkalk (green). Width of outcrop is ca. 1000 m. Note overlying Dachstein Limestone (blue) in the summit area. Cliff sections (A–C), marker horizon (White Bed), shell beds (I–VII) and localities (19, 21, 23, 24) inserted from Stanton & Flügel (1989), (from Kaufmann, 2009).

East of Kammerköhr inn (Fig. 30) toe-of-slope calcarenites (bioclastic pack and grainstones rich in crinoid and bivalve debris with Rhaetian microfauna and rare brachiopods (Turnsek et al., 1999) are exposed followed to the south by different platform carbonates respectively reef facies types (Fig. 31). The major part of the buildup is not formed by a real framework (Stanton & Flügel, 1989, 1995) but mainly by fine bioclastic limestones and coral fragments. Its top is partly overgrown by large Rhaetian bushlike corals that are not intergrown (Capping Beds). The “Fischer’s Coral Garden” (Fig. 30) is an area of abundant corals which consist of a dense growth of large “*Thecosmilia”* (PILLER, 1981; STANTON & FLÜGEL, 1989). Part of the corals are still in living position, whereas two third are tilted or upside down. None has been found growing upon another, so evidence for any rigid skeletal framework is missing (STANTON & FLÜGEL, 1989). The coral heads have frequent microbial crusts, *Microtubus* and inozoan calcisponges with ostracods, miliolid foraminifera and rare nodosariids (STANTON & FLÜGEL, 1989). As in Adnet coral growth of the capping facies stopped during end-Triassic time and was covered by a still Rhaetian oncoid bearing layer with reworked Megalodont shells following the ongoing latest Rhaetian sea level drop.

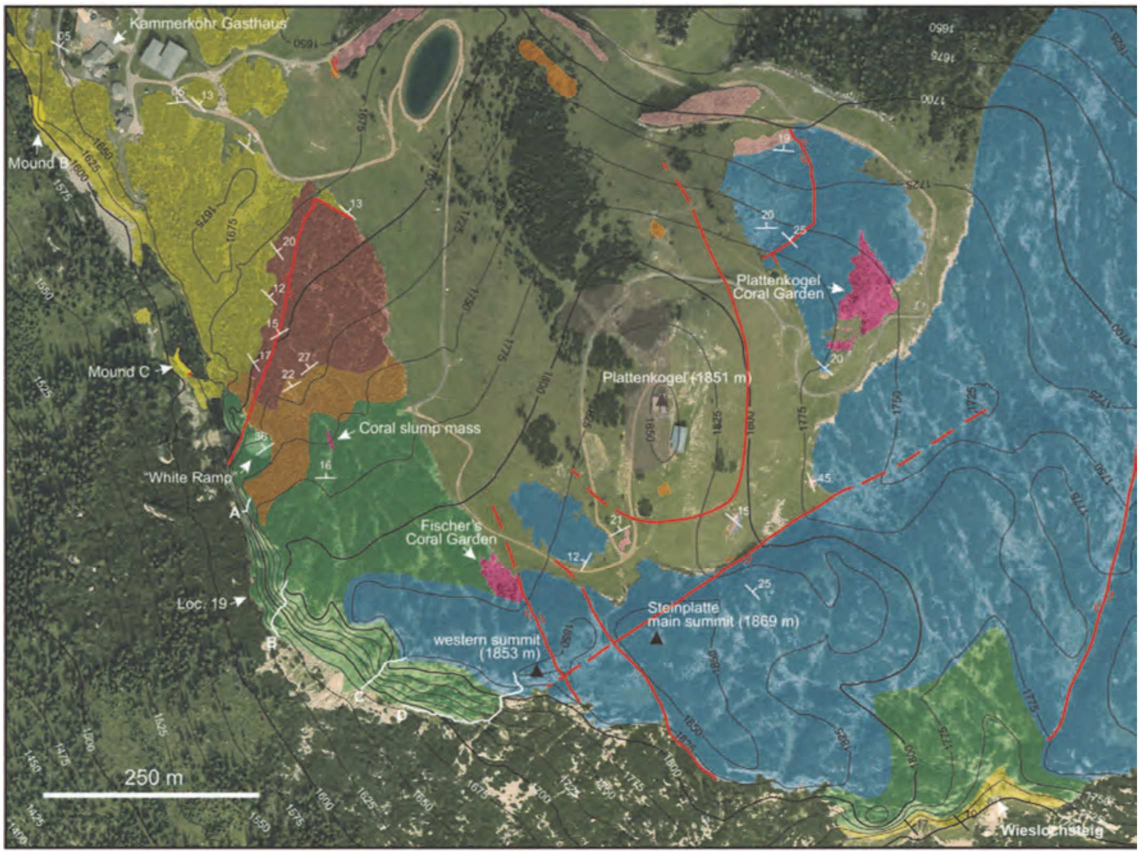

Fig. 30. Locality and geological map of the Steinplatte area. A–D = Cliff sections of STANTON & FLÜGEL (1989). Red lines = major faults. For legend see Fig. 29, (from KAUFMANN, 2009).

The palaeorelief of the carbonate platform still existed until the Middle Liassic (Fig. 32). A sedimentary break conceals both the Triassic-Jurassic boundary interval and the disappearance of the coral fauna at the Triassic-Jurassic boundary. Thus, studies of Triassic-Jurassic sections at top and slope position are restricted to local occurrences, where the onset of Liassic sedimentation is preserved in small crevices or interstices of the rough Triassic relief. Due to the strikingly similarity of their facies and age (Middle Hettangian) with beds from the Adnet reef slope, these local sediments are attributed to the Schnöll-Formation (BÖHM et al., 1999). Non-rigid siliceous sponges (mainly *Lyssacinosida*) formed spicular mats during starved Liassic sedimentation (Fig. 32). They settled on detrital soft or firm grounds that were successively dominated by spicules of their own death predecessors and infiltrated sediments. Skeletal remains and adjacent micrites were partly fixed by microbially induced carbonate precipitation due to the decay of sponge organic matter (KRYSTYN et al., 2005). The irregular compaction of the sediment as well as volume reduction during microbialite

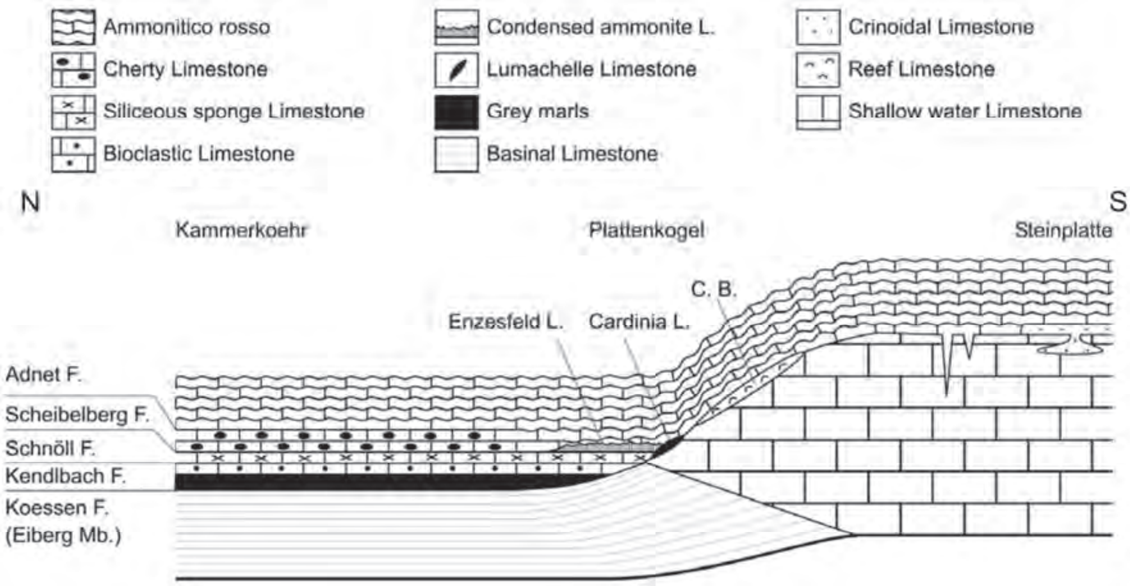

Fig. 31. Schematic Steinplatte cross-section from the platform to the basin; note the lowstand position of the Capping Beds and the onlap geometries of the Hettangian rocks (Kendlbach F., Schnöll F., Enzesfeld L.) as well as the delayed platform flooding by the Adnet Formation (from KRYSTYN et al., 2005).

formation resulted in syndiagenetic stromatactis cavities. Subjacent to the spiculite a sequence of allochthonous sediments that starts with a *Cardinia*-dominated shell layer (also ostreoids, pterioids, pectinoids) fills sinkholes and crevices of the Triassic relief. At the base of the sequence, the *Cardinia* beds contain reworked and corroded clasts of the underlying top-Triassic *Pecten*-lumachelle layer, which is also found at the edge of the depression. The clasts are often covered by black to brown goethite crusts that consist of thin and curly lamina, growing in cauliflower-like to digitate structures of up to 5 mm thickness. The succession above the spiculite continues with some red crinoidal limestones, where a few isolated sponges appear but spicular mats are absent. They are followed by the Marmorea Crust, an ammonite-rich and condensed marker horizon of late Hettangian age and the Sinemurian Adnet Formation. The Liassic sequence ends in red nodular breccias.

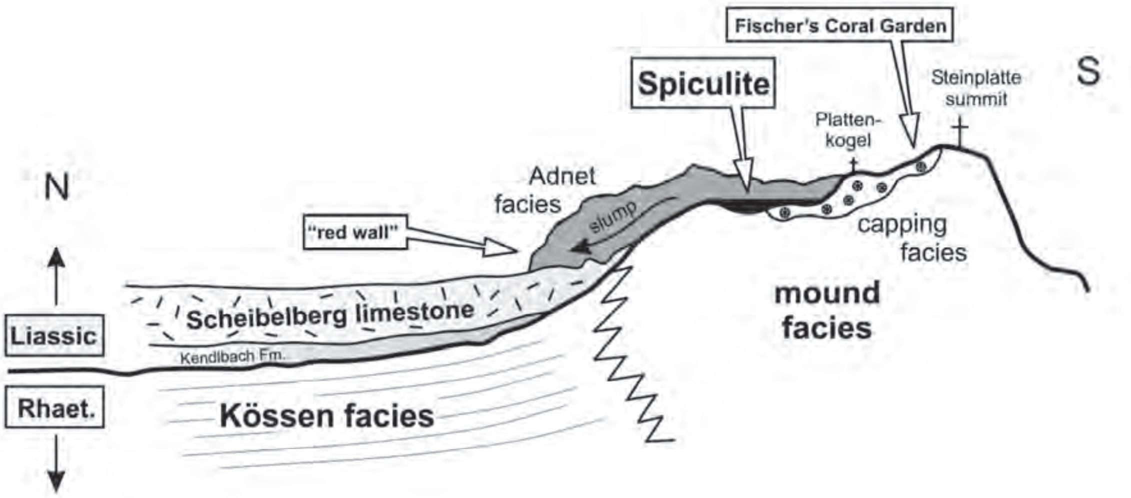

Fig. 32. Lower Jurassic events on the northern slope section of Steinplatte (from KRYSTYN et al., 2005).

In contrast, north of the Steinplatte, sedimentation of the Kössen Formation continuously passes into grey cherty limestones of the adjacent basin (Hettangian Kendlbach Formation and Sinemurian Scheibelberg Formation). The latter is characterised by varying, often high amounts of siliceous sponges and/or siliceous bulbs (MOSTLER, 1990; KRAINER & MOSTLER, 1997).

3.2.5. Locality 8 – Eiberg

The Eiberg section is located in an active cement quarry (SPZ Zementwerk Eiberg GmbH) about 3 km south of Kufstein (North Tyrol) (Fig. 1). The upper part of the Hochalm Member (upper unit 2 to unit 4, sensu GOLEBIOWSKI, 1989) and the Eiberg Member are exposed (Figs. 33, 34). The top of the Eiberg Member contains the Event Bed and the first post-extinction marls but is then separated from the Early Jurassic strata (Allgäu Formation) by a prominent fault. The Kendlbach Formation, which contains the Triassic-Jurassic boundary, is mostly missing. The Eiberg section was palaeogeographically situated in the central part of the Eiberg Basin (Fig. 5). KRYSTYN et al. (2005) supposed a connection with the open Tethys to allow the immigration of the pelagic ammonoids and conodonts. The Kössen Formation, Rhaetian in age, records a long-term deepening of the basin, with repeated shallowing upward cycles well documented by the litho and biofacies (Fig. 34). Particularly the associations of bivalves and brachiopods studied in details by GOLEBIOWSKI (1989, 1991) give indication of depth changes (Fig. 35).

Fig. 33. Eiberg Quarry behind main cement factory exposing Kössen Formation with top Hochalm Member (Units 3 + 4) and lower Eiberg Member (Units 1 + 2).

The Hochalm Member

Only the top of the Hochalm Member, Unit 2 is visible on the southern part of the quarry. If shallow water carbonate dominated bioclastic limestone in the Unit 1, these shallow water carbonate (Fig. 36B) are rarer in the Unit 2 and disappear in Unit 3. The proximal tempestite of Unit 1 become more distal in Unit 2 and the marls are increasing in thickness. The shallowing upward cycles in unit 2 are marked by alternation of distal tempestite, laminated