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## Blatt NL 33-01-13 Kufstein

Siehe Bericht zu Blatt 121 Neukirchen am Großvenediger von JÜRGEN M. REITNER

## Blatt NL 33-02-03 Waidhofen an der Ybbs

### **Bericht 2024 über geologische Aufnahmen im Gebiet von Sankt Georgen in der Klaus auf Blatt NL 33-02-03 Waidhofen an der Ybbs**

DIEGO A. GARCÍA-RAMOS

The surveyed area is situated about 4.5 km northwest of Waidhofen an der Ybbs (Lower Austria), immediately west of the Ybbs River and covers approximately 12 km<sup>2</sup>. The northern boundary is defined by a west-east trending line approximately 3 km long, located just north of the Engelsberg farmhouse. At the northwest corner, the area is bounded by another west-east trending line about 1 km in length, north of the hamlet of Baumgarten. The western limit coincides with the Treffling Creek, while the south-western boundary is marked by the road connecting Wieserhöhe to Wegerkapelle. The southern boundary aligns with the Nellinbach Creek, and the southeastern corner is defined by the road bordering Böhlerwerk to the west. The eastern limit is formed by the Ybbs River, extending between Böhlerwerk and the village of Au.

The entire study area belongs to the Main Flysch Nappe (SCHNABEL, 1992) within the Rhenodanubian Flysch Nappe System. The flysch formations in adjacent maps, including Großraming (GK 69) and Ybbsitz (GK 71), have been mapped and described by EGGER & VAN HUSEN (2011) and SCHNABEL in RUTTNER & SCHNABEL (1988), respectively. Notably, SCHNABEL (EGGER, 1995) suggested that in the area of Ybbsitz the Altlenzbach Formation could be subdivided into members, but did not formally define these. EGGER (1995) proposed a formal lectostratotype for the Altlenzbach Formation in the Ahornleitengraben area, located about 15 km southeast of the town Steyr. This profile reveals all four members of the Altlenzbach Formation.

The survey work has revealed outcrops of the Altlenzbach Formation in two approximately east-west trending, over-

thrust upright-bedded units. In the northern unit, located in the Engelsberg – Faßberg – Au area, only rocks of the Altlenzbach Formation have been identified, and these dip moderately to steeply southward, with stratigraphic ranges extending from the Maastrichtian in the north to the Paleocene (Thanetian, NP9) in the south.

The southern unit begins with grey marlstones and marly limestones belonging to the Röthenbach Subgroup (Middle Campanian), which is confined to the prominent ridge that stretches from the Auerbauer settlement through St. Georgen and westward into the Treffling valley.

Immediately south of the ridge there are Lesesteine of the Altlenzbach Formation (Maastrichtian), which stratigraphically overlies the Röthenbach Subgroup. Outcrops of the Altlenzbach Formation occur in the creeks distributed in the southern flank of the ridge, extending to Wieserhöhe and the adjacent Nellingbach valley to the east. These rocks of the Altlenzbach Formation also exhibit moderate to steep southward dips in the southern unit.

The thrust surface separating the two units aligns with the base of the stratigraphically older Röthenbach Subgroup (Middle Campanian), which lies above the younger strata of the Altlenzbach Formation (Thanetian, NP9), thus following the orientation of the described ridge. Furthermore, the diminishing thickness of the Röthenbach Subgroup towards the west indicates a basal oblique cut of this unit along the steeply south-dipping overthrust surface.

This overthrust surface and its general configuration is illustrated in the “Geologische Karte von Niederösterreich 1:200.000” (SCHNABEL et al., 2002).

Additionally, significant geological features include Würmian terraces associated with the Ybbs River and mass movements such as translational-rotational landslides. Among these, a prominent landslide occurs north of the road connecting Sankt Georgen in der Klaus to the hamlet of Eben, affecting an area of approximately 0.628 km<sup>2</sup>.

## The Altlenzbach Formation

Two significant areas attributed to the Altlenzbach Formation *sensu lato* have been identified, located to the north and south of the geomorphological ridge on which the village of Sankt Georgen in der Klaus is situated. This classification is based on a combination of lithological and biostratigraphic criteria, using nannofossil data. 86 samples were collected for biostratigraphic analysis, with approximately 11 % being barren. The samples predominantly feature mixed nannofossil assemblages, including both autochthonous and reworked elements. In many cases, the scarcity of biostratigraphic markers has hindered reliable age determination for these samples. Neighboring samples containing Upper Maastrichtian markers support the hypothesis that the problematic samples are younger than indicated by the recorded, likely reworked, nannofossil assemblages, as previously noted by EGGER (1993, 1995) and EGGER & VAN HUSEN (2011) in other Flysch Zone samples.

Generally, samples from the southern Altlenzbach unit suggest an age ranging from UC15 (Upper Campanian) to UC17 (Lower Maastrichtian). Notably, the absence of Upper Maastrichtian marker species such as *Lithraphidites quadratus*, *Micula murus* and *Micula prinsii* supports this conclusion.

In contrast, samples from the northern Altlenzbach unit predominantly contain the aforementioned markers indicative of the UC20 zone of the Upper Maastrichtian. However, there are also fewer samples categorized as UC18, UC19, and a single sample belonging to the NP9 zone (Thanetian).

Most samples were collected along small creeks, with only a limited number sourced from road cuts and ditches. The outcrops typically consisted of isolated intervals along the creeks, complicating the observation of continuous stratigraphic successions. The primary characteristic of flysch sedimentation in both the northern and southern units consists of alternating marls and sandstone beds featuring incomplete Bouma sequences. The thickness of these marly and sandy beds can range from approximately 30 cm to several meters (> 6 m). This feature is characteristic of the Ahornleiten Member (EGGER, 1995). The ages of the samples from the southern unit align with the description of this member as outlined by EGGER (1995).

Conversely, the facies arrangement of the younger northern unit (UC20 to NP9), while similar to that of the southern unit, does not conform to the description of the time-equivalent Acharting Member as defined by EGGER (1995). The Acharting Member is characterized by an alternation of indurated fine-grained sandstones and siltstones interspersed with soft, dark greyish clayey marls. According to EGGER (1995), the sandstone beds within this member are notably distinct due to their biogenic components, including foraminifera and debris from coralline algae. Given the differing facies arrangement of the northern unit compared to what is expected from the standard profile proposed by EGGER (1995) and from outcrops in adjacent areas dealt with by EGGER & VAN HUSEN (2011), the materials from the northern unit are classified under the Altlenzbach Formation *sensu lato*.

## Perneck Formation

Materials associated with the Perneck Formation are seldom found in the easternmost section of the surveyed area, specifically along the forest road leading from Auerbauern-Siedlung to the Schachen farmhouse. An additional outcrop is located 175 m southwest of the first. These outcrops consist of unconsolidated reddish pelite.

No samples were collected at this location. According to existing literature (e.g., EGGER & VAN HUSEN, 2011), this unit is dated to the Upper Campanian and is characterized by the presence of the nannofossil *Uniplanarius trifidus*.

## Röthenbach Subgroup (“Zementmergelserie”)

The Röthenbach Subgroup (EGGER & SCHWERD, 2008) represents the lithostratigraphic formalization of the “Zementmergelserie”. Unfortunately, well-exposed outcrops of this unit were not observed in the surveyed area. The identification of this unit is based on three key criteria:

- 1. Geomorphology:** Clear geomorphological features, particularly evident through laser scanning, indicate a lithological control of the relief, manifested as a prominent ridge trending approximately west–east.
- 2. Lesesteine:** The presence of Lesesteine composed of indurated marly limestone with calcite veins.
- 3. Biostratigraphy:** Biostratigraphic assessment based on nannofossils extracted from grey marly limestones often yielding *Chondrites intricatus*. The nannofossil assemblages are typically characterized by taxa such as *Eiffellithus parallelus*, *Uniplanarius trifidus*, *Ceratolithoides aculeus*, *Reinhardtites levis*, *Lithastrinus quadricuspidis*, *Broinsonia parca constricta*, and *Tranolithus orionatus*.

This ridge extends over 4 km from the Ybbs River to the Treffling Creek, where it gradually diminishes.

Currently, there are no exposed outcrops delineating the boundary between this ridge and the southern or northern units of the Altlenzbach Formation *sensu lato*. The interpolated boundary has been inferred based on the distribution of Lesesteine, with the assumption that the calcareous coarse sandstones belong to the Altlenzbach Formation. Large blocks of marly limestone containing *Nereites irregularis* and *Chondrites* *issp.* can be found at the easternmost edge of Sankt Georgen in der Klaus, likely resulting from excavation activities related to house construction. This facies is typical of the “Zementmergelserie”. West of the intersection between the road to Sankt Georgen in der Klaus and the road leading to the hamlet of Baumgarten, numerous Lesesteine composed of indurated marly limestone appear as man-made stone piles, scattered down to the Treffling Creek.

## Quaternary terraces

Fluvial sediments and associated terraces are exposed north and south of the village of Au, right east of the road from Au to Böhlerwerk. Outcrops along a west–east cross-section can be observed along the cliffs carved by the creek immediately south of Au, close to the Ybbs river. These materials are composed of thick (~ 2 m) stacked banks of conglomerate made up of cemented, rounded limestone clasts. The relative topographic position of these outcrops with respect to the Ybbs river suggests that these terraces belong to the Würm glaciation.

## Landslides

Several examples of landslides (the majority of which can be referred to be of translational-rotational type) can be identified in the surveyed area. The small examples display an elongated irregular outline and vary in length roughly from 100 to 200 m. They are characterized, in general, by a main scarp, which is followed downslope by numerous lobes each of which is in the scale of a few meters in length. The largest landslide, with an area of ~ 0,628 km<sup>2</sup>, occurs just north of the ridge of Sankt Georgen in der Klaus. The scarp of this landslide is roughly C-shaped with the concavity facing to the north. The southwest–north-east extension of this landform is 1.4 km. The northern limit coincides with the creek running towards the village of Au.

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## Bericht 2024 über geologische Aufnahmen im Gebiet von Kritzensdorf auf Blatt NM 33-12-19 Tulln an der Donau

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The surveyed area is situated west of the Kritzensdorf Nord railway station in the district of Tulln (Lower Austria). It is bounded to the north by a forest road south of Hundsberg, which connects the villages of Hadersfeld and Kritzensdorf. The Weißer Hof marks the southwestern corner of the area, while the southern border is delineated by the forest road linking Weißer Hof and Kritzensdorf. The Waldandacht area

lies immediately north of this road. The eastern edge of the surveyed area is heavily urbanized, yet one of the largest outcrops of the Altlenzbach Formation can be found on the cliffs adjacent to the Kritzensdorf Nord railway station.

This study area belongs to the Greifenstein Group of the Rhenodanubian Flysch nappe system and is located at the easternmost corner of the Wienerwald (EGGER, 2013; EGGER & WESSELY, 2014). Three lithological units trending approximately SW–NE have been identified from northwest to southeast: the Greifenstein Formation, the Irenental Formation and the Altlenzbach Formation.

## Altlenzbach Formation

The Altlenzbach Formation is present in the southern half of the study area, primarily south of the creek that delineates the northern boundary of the Weißer Hof hill, which flows eastward towards Kritzensdorf. Much of the area attributed to the Altlenzbach Formation has been identified based on Lesesteine, with only a few notable outcrops. The most significant outcrops are located near the cliffs adjacent to the Kritzensdorf Nord railway station.

At this latter locality, the stratigraphic succession is characterized by thick beds (1.5 to 2 m) of amalgamated, fine-grained, homogeneous calcareous sandstones, with a dip orientation of 146/57°. Crude parallel lamination is occasionally observed, and some beds thin out before merging laterally with the main bed. These primary beds are interbedded with thin layers (approximately 2–5 cm thick) of dark clay, which do not react with a 10 % HCl solution. All pelite samples examined were devoid of nannofossils.

Approximately 200 m southwest of the Kritzensdorf Nord railway station, there are well-exposed variegated marls in shades of beige, dark grey, bluish, and dark brown, arranged in thin beds (around 5 cm thick). Interspersed within these marls are several sandstone layers (approximately 35 cm thick). Evidence of slumping and syndimentary faulting, occurring at scales of about 30 cm, is common throughout this section. The marls exhibit trace fossils, with *Chondrites intricatus* being the most dominant.

Nannofossil analysis from this formation indicates an association consistent with zone NP8. This is supported by the prevalent occurrence of *Discoaster mohleri*, *Heliolithus riodelii*, and the absence of *Discoaster nobilis*. Other notable species within this association include *Toweius eminens*, *Heliolithus kleinpellii*, *Fasciculithus tympaniformis*, *Calciosolenia aperta*, *Zeughrabdodus sigmoides*, and *Prinsius martinii*. The presence of *Discoaster multiradiatus* suggests proximity to the base of zone NP9; however, this is inconsistent with the absence of *D. nobilis*. This pattern may indicate an early occurrence of *D. multiradiatus* prior to its widespread presence.

Additionally, approximately 1 km southwest of the Kritzensdorf Nord railway station, there are outcrops predominantly composed of marly sediments interspersed with thin sandstone layers (about 3–4 cm thick) exhibiting ripple marks. While most samples analysed for nannofossil content were barren, one sample indicated an Upper Maastriechian age (biozone UC20a), based on the identification of *Lithraphidites quadratus*. Other species in this association include *Lithraphidites praequadratus*, *Cribracorona gallica*, *Ceratolitho-*