

# A UNIQUE UPPER ANISIAN REEF FACIES IN THE NE PART OF THE TETHYS: BARADLA CAVE, AGGTELEK KARST (NE HUNGARY)

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**Abstract:** The development of the oldest real Triassic reef was investigated in a continuous section. The appearance of the reef mounds was preceded by an acidic volcanic activity and by the deposition of a thin limestone layer with radiolarian packstone microfacies type. In the reef development two main stages can be distinguished: (1) mud mound stage, and (2) reef crest stage.

**Key words:** Middle Triassic, NE-Hungary, Aggtelek Facies Unit, Steinalm Limestone, lagoonal facies, reef development.

**Geological setting:** The cave is situated between Aggtelek and Jósvalfő (NE Hungary, Aggtelek Karst). The sequence belongs to the Aggtelek Unit (Silicicum s.s.). The studied section reveals a continuous section of Gutenstein Limestone / Steinalm Limestone / Wetterstein Limestone.

## **Why is this section unique?**

- because it is the only known, well developed reef-barrier from this period (Upper Anisian)
- we can follow the reef development step-by-step in our section.

## **We are seeking evidences for the following questions:**

- What made it possible that after the end-Permian crisis and a global "reef gap" the reefs appeared again in the Upper Anisian?
- What is the connection between the rifting process of the Tethys and the reoccurrence of the reefs?

## Section:

The **Gutenstein Limestone** is overlain by **Steinalm Limestone**, which consists mainly of peritidal lagoonal facies. It contains mainly dasycladaceans (*Physoporella pauciforata undulata* PIA, *P. pauciforata sulcata* BYSTRICKY, *P. pauciforata* (GÜMBEL) *pauciforata* BYSTRICKY, *P. minutula* (GÜMBEL), PIA, *P. minutuloidea* HERAK, *P. intusannulata* HURKA, *P. dissita* PIA, *Teutloporella peniculiformis* OTT, *Diplopora hexaster* PIA, *Anisoporella anisica* OTT) and foramifers (*Meandrospira dinarica* KOCHANSKY-DEVIDÉ & PANTIC, *Endoteba* gr. *badouxi* (ZANINETTI BRÖNNIMANN), *Haplophragmella inflata* (ZANINETTI & BRÖNNIMANN), *Endotriadella* cf. *wirzi* KOEHN-ZANINETTI). The fossils indicate Pelsonian age.

In the Pelsonian lagoonal limestone two deeper water horizons are intercalated. They were deposited below the wave base (ca. 40-50 m depth). 1., One of them is a red brachiopodal limestone. The conodonts (*Gondolella praeszabói bystrickyi* KOVÁCS & PAPSOVÁ & PERRI, *G. praeszabói praeszabói* KOVÁCS & PAPSOVÁ & PERRI.) indicate the higher part of Pelsonian-Lower Illyrian.

The second horizon, which was deposited also in a deeper environment, is rich in conodonts and ammonoids. In the lower part of the horizon conodonts (*Gondolella bifurcata bifurcata* (BUDUROV & STEFANOV), *G. bifurcata hanbulogi* (SUDAR & BUDUROV), and *G. bulgarica* (BUDUROV & STEFANOV), *G. excelsa* (MOSHER)) indicate definitely the upper part of Pelsonian. Whereas in the upper part of the horizon the conodonts (*Gondolella praeszabói bystrickyi* KOVÁCS & PAPSOVÁ & PERRI, *G. praeszabói praeszabói* KOVÁCS & PAPSOVÁ & PERRI) indicate the Upper Pelsonian-Lower Illyrian interval. Globular ptychitids indicate a lower Illyrian age (Krystyn pers. comm.).

Under the first reef bed a 2 cm thick red clay intercalation appears. X-ray investigation of the clay revealed the volcanic origin (61% 1 Md illite). The magma could have been rhyolite-rhyodacite-dacite (Kovács-Pálffy P. pers comm.). The red clay is followed by a few cm thick limestone layer with a radiolarian packstone microfacies. The radiolarian bed is covered by the reef limestone. The first Sphinctozoans appear immediately after the radiolarian bed. At the beginning of the reef development the crinoids dominate, and the Sphinctozoans are only subordinate. This horizon represents the stabilisation stage of the reef evolution (Alberstadt and Walker 1976). In that stage the crinoids dominate and prepare a hard-ground for the later reef building organisms.

In the first stage of the reef development we find only small bioherms, the larger continuous reef crest appears only later. The Upper Anisian mud mounds evolve later into the Wetterstein-type sphinctozoan reef. The first description of the reef community was published by Scholz (1972).

## References

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**Fig. 1.** Geographical and geological position of the investigated section.  
Legend: 1: Platform, 2: Reef, 3: Slope, 4: Pelagic facies, 5: Metamorphic units.

