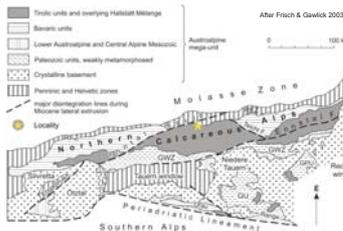


CEPHALOPOD COQUINA BEDS IN THE WETTERSTEIN LIMESTONE (ANISIAN, HÖLLENGEBIRGE, SALZKAMMERGUT, AUSTRIA).

A. Vörös¹; O. Piros²; T. Budai²; J. Haas³; H. Lobitzer⁴

¹Hungarian Natural History Museum, Department of Geology and Paleontology, HAS-HNHM Research Group for Paleontology, H-1083 Budapest, Ludovika tér 2; voros@nhmus.hu

²Geological Institute of Hungary H-1143 Budapest, Stefánia út 14. # ³HAS-ELTE Research Group for Geology H-1117 Budapest, Pázmány sétány 1/c. # ⁴A-4820 Bad Ischl, Lindastrasse 3, Austria



Geology and geography

In the Middle Triassic large Wetterstein-type platforms developed on the passive margins of the western Neotethys Ocean. On the platforms thick platform carbonates, i.e. cyclic peritidal-lagoonal sequences and marginal reef facies were formed. The Hölleengebirge plateau in the northern part of the Northern Calcareous Alps is predominantly built up by an up to 500 m thick sequence of the Wetterstein Limestone. On the Feuerkogel the studied beds of the Wetterstein Limestone are made up predominantly of 2-5 mm-sized fragments of dasycladacean algae. Near Ebensee, on the Feuerkogel plateau, cephalopod bearing coquina interbeds consisting predominantly of orthocone cephalopods were found within the dasycladacean inner platform lagoon facies.



Locality, collection

It was very difficult to extract the fossils from the well-cemented limestone; after several hours of hammering, our team collected only about sixty specimens of cephalopods. Despite the paucity of fossils and the poor preservation the fauna is rather diverse and contains the following species: *Mojsisovicsites*? sp., *Ptychites* sp., *Flexopychites* cf. *flexuosus*, *Megaphyllites*? sp., *Proarcestes* sp., *Norites dieneri*, *Hungarites* sp., *Parakellinertes* sp.



Lithology

The Wetterstein Limestone mainly consists of 2-5 cm sized fragments of dasycladacean algae. The texture of the limestone is usually grain-supported, mostly packstone, locally grainstone. The cephalopod coquina beds contain nodules of peloidal microparite probably of microbial origin, and microtidally coated blocks. On weathered surfaces the cross sections of orthocone cephalopods are frequent, but ammonoids also occur.



Mass accumulation of fragments of Dasycladaceae algae

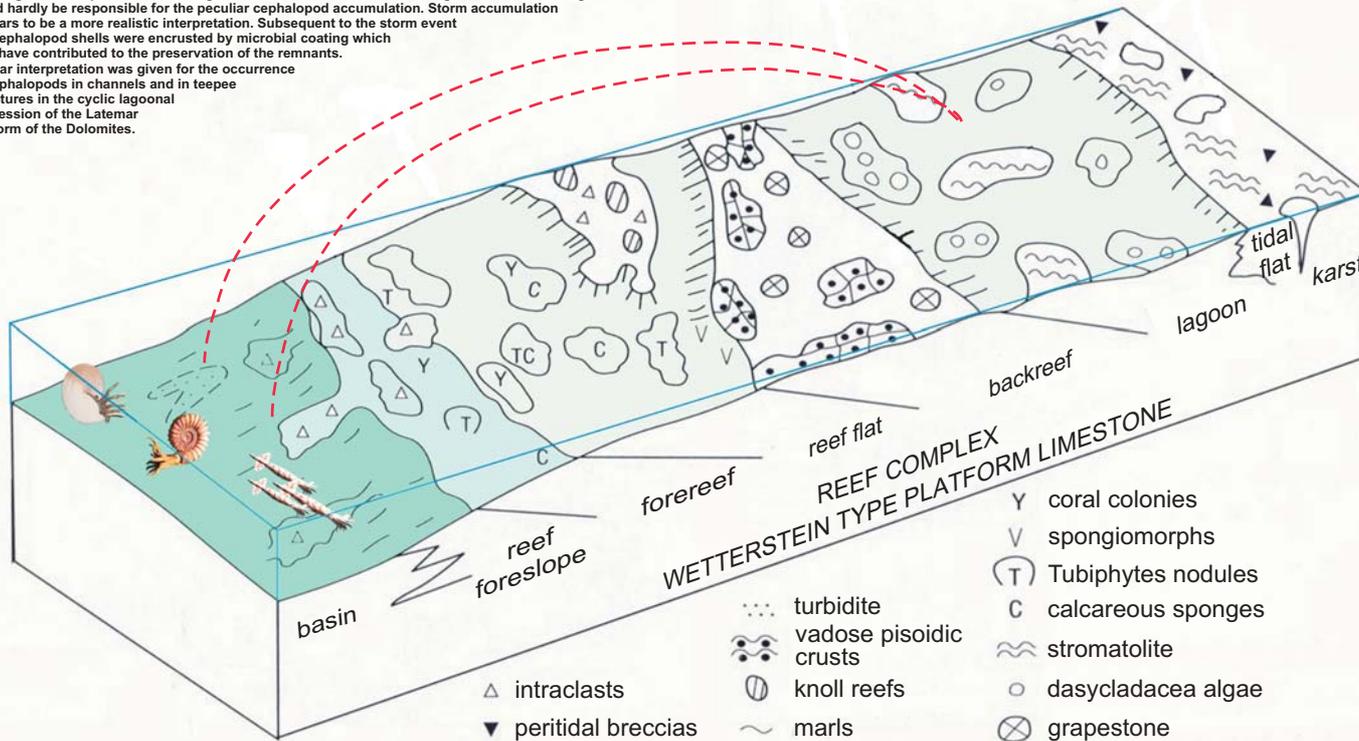
Orthocone cephalopods



Depositional model

Microfacies characteristics of the cephalopod-bearing beds do not differ significantly from those of the typical development of the Wetterstein Limestone, implying similar depositional and diagenetic conditions. It means that a significant facies change i.e. relative sea-level rise could hardly be responsible for the peculiar cephalopod accumulation. Storm accumulation appears to be a more realistic interpretation. Subsequent to the storm event the cephalopod shells were encrusted by microbial coating which may have contributed to the preservation of the remnants. Similar interpretation was given for the occurrence of cephalopods in channels and in tepee structures in the cyclic lagoonal succession of the Latevar platform of the Dolomites.

After Heinrich & Zankl (1986), modified



Sedimentological features

Characteristic microfacies of the platform lagoon



Dasycladacean grainstone (with *Diploporella annulata annulata*). The interparticle pores are filled partly by peloidal micrite, partly by sparry calcite



Dasycladacean wackestone (with *Diploporella annulata annulata*). Clotted peloidal microparite occurs among the coarse-grained bioclasts

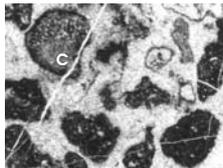
Characteristic microfacies of the cephalopod coquina



Microbial particles (pseudo-oncoids) with irregular spar-filled pores. The particles are enveloped by fibrous calcite cement, the larger pores are filled by drusy cement



Fragments of ammonites in peloidal microparite matrix. The solution pores are filled by sparry calcite

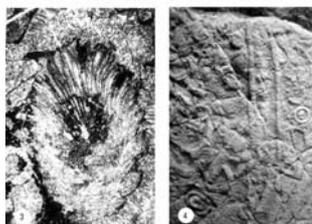


Microbial particles and a fragment of calcified cyanobacteria (C). The particles are enveloped by fibrous calcite cement, the larger pores are filled by drusy cement



Microbial particles (pseudo-oncoids). In the central part of the picture a small gastropod is coated by peloidal microparite of microbial origin

Dasycladaceae flora

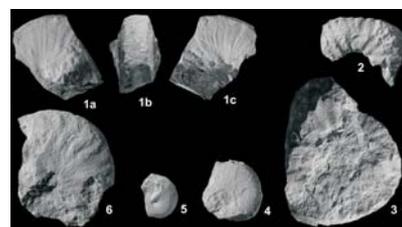


1-2. *Diploporella annulata annulata*
3. *Teutloporella penicilliformis*
4. *Teutloporella herculea*

Stratigraphical position

The dominant elements of the algae flora are *Teutloporella herculea* and *Diploporella annulata annulata*, so the age of the complex is Late Anisian to Early Ladinian. The stratigraphical range ammonoid genera *Hungarites* and *Parakellinertes* is confined to the Late Anisian Subzone. *Norites dieneri* occurred exclusively in the Avisianum Subzone. Consequently, the age of the coquina beds can be restricted to the uppermost, Avisianum Subzone of the Reitzli Zone.

Ammonoidea fauna



1a-c: *Norites dieneri* Arthaber, 1903
2: *Parakellinertes* sp.
3: *Parakellinertes* sp.
4: *Hungarites* sp.
5: *Megaphyllites*? sp.
6: *Flexopychites* cf. *flexuosus* (Mojsisovics, 1882)