

The invertebrate fauna from the Barremian of Serre de Bleyton (Drôme, SE France)

By Andreas KROH¹, Alexander LUKENEDER¹ & Gero MOOSLEITNER²

(With 2 figures)

Introduction

Lower Cretaceous pelagic to hemipelagic deposits are wide-spread in Southern France (PASQUINI et al. 2004; ARNAUD 2005). The studied section is located in the Commune d'Aranyon (Drôme provençale), and is exposed on the southern side of the Serre de Bleyton ridge, east of Col de Perty. There fossiliferous Barremian sediments occur in form of siliciclastic and turbiditic beds, the so-called "*coulées boueuses*". These are channels and associated fan-structures terminating in the Vocontian Basin (ADATTE et al. 2005; ARNAUD 2005).

Macrofossils are usually uncommon in pelagic deposits of the "*coulées boueuses*". Apart from the rare occurrence of ammonites few other macrofossils can be found. This is reflected by the scarcity of biostratigraphic data on the area. At the Serre de Bleyton ridge, however, at least two highly fossiliferous horizons containing diverse invertebrate assemblages are present. Although, obviously size-sorted and transported, they yielded rich coral, mollusc (cephalopods, bivalves and gastropods), echinoderm (asteroids, ophiuroids, crinoids and echinoids) and ostracod assemblages. These horizons are here interpreted to represent basin-floor fans (ADATTE et al. 2005; ARNAUD 2005). A first brief report on the fauna from Serre de Bleyton was published by MOOSLEITNER (2007).

Study area

The Serre de Bleyton section comprises mainly turbiditic sediments (ARNAUD 2005), including bioclastic grainstones rich in meso-scale fossils. The assemblages include both autochthonous and reworked components deposited in basin-floor fans (ADATTE et al. 2005; ARNAUD 2005). The latter deriving from the Provence Platform and hemipelagic areas to the north-west of the Vocontian Trough.

¹ Department of Geology & Palaeontology, Natural History Museum Vienna, Burgring 7, 1010 Vienna, Austria; e-mail: andreas.kroh@nhm-wien.ac.at; alexander.lukeneder@nhm-wien.ac.at

² Hellbrunner Allee 57, 5020 Salzburg-Morzg., Austria; e-mail: gero.moosleitner@aon.at

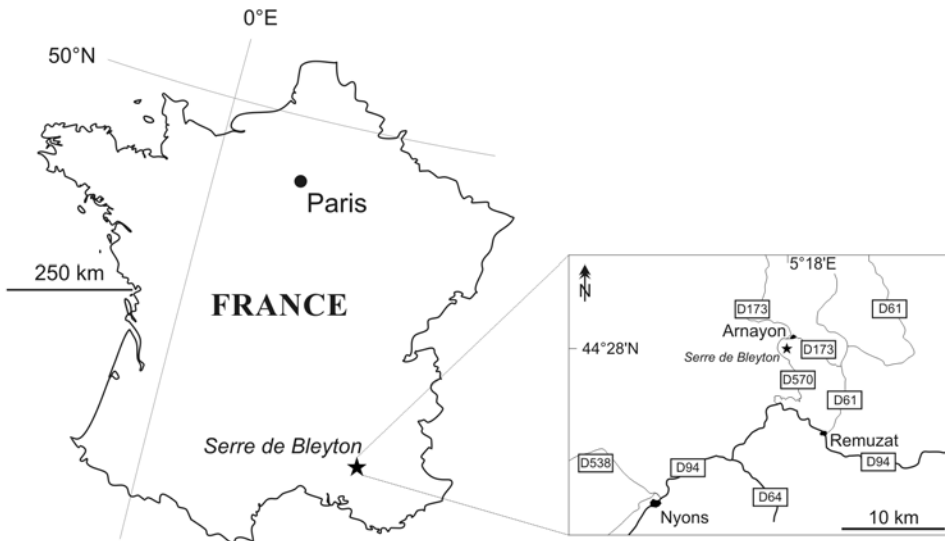


Fig. 1. Locality map of France with the position of the Serre de Bleyton locality Department Drôme, SE-France (left). Detailed map of the roads around Serre de Bleyton with outcrop position of the Barremian ammonoid-bearing beds indicated by an asterisk (right).

The Serre de Bleyton ridge is located east of Col de Perty in the Commune d'Aranyon (Department Drôme, SE France) and lies about 20 km north-east of Nyons and 2 km south-east of Arnayon (Fig. 1). The section comprises a light-grey intercalation of marls and limestone beds, and is strongly affected by local tectonics. It is poorly exposed, but the fossiliferous horizons crop out along a forest road on the southern slope of the Serre de Bleyton ridge. Three of these horizons have been sampled by one of us (G.M.) for the present study. The GPS (Global Positioning System) coordinates for these sampling points are:

Locality 1: N 44°28'55'', E 05°18'00''

Locality 2: N 44°28'54'', E 05°17'58''

Locality 3: N 44°28'58'', E 05°18'02''

The fossiliferous horizons exposed at the three localities correspond to three different levels in the succession exposed at Serre de Bleyton. Locality 3 (Early Barremian) is the stratigraphical oldest of the three horizons, whereas localities 1 and 2 are slightly younger, possibly Late Barremian in age. Due to local tectonics, it was not possible to measure a detailed section along the forest road. The geological situation of the area, however, is currently being reassessed by A. & H. ARNAUD (in prep.).

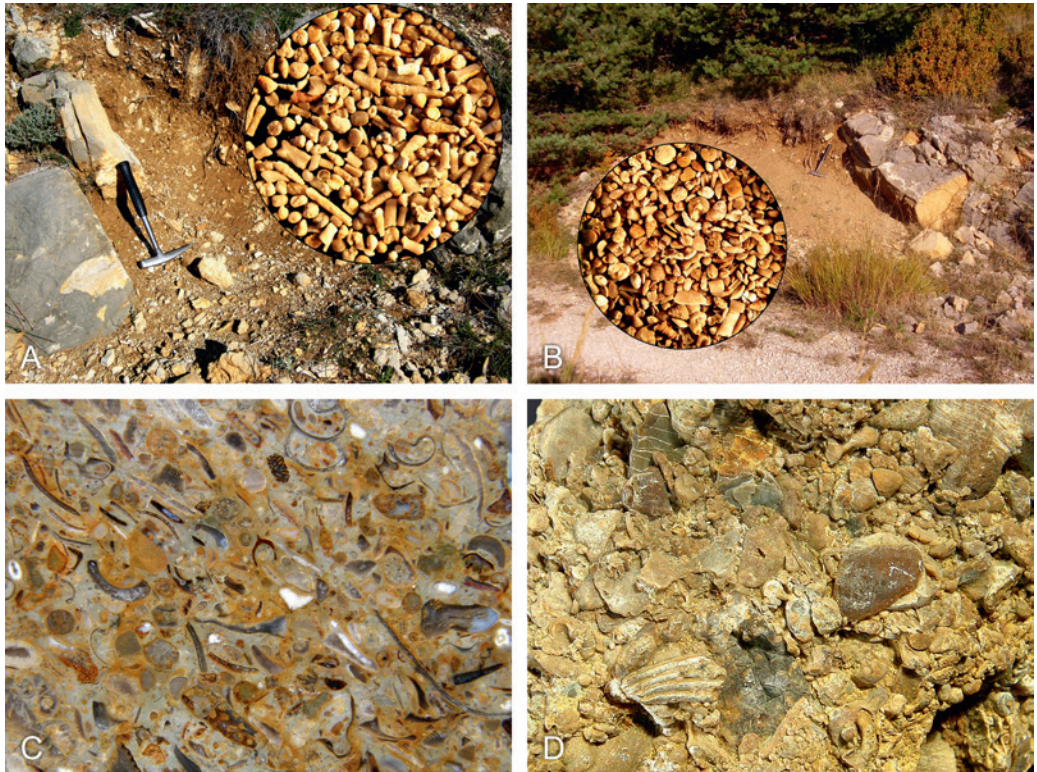


Fig. 2. A: locality 1 and associated microfauna; B: locality 2 and associated microfauna; C: polished section from the bed exposed at locality 1 (width of image: 60 mm); D: weathered surface of the bed at section 2 (width of image: 40 mm).

The horizons exposed at localities 1 and 2 are highly fossiliferous and very similar in composition, although particle size differs between the horizons, that of locality 2 being slightly larger in average. Locality 3, in contrast, delivered mainly belemnites.

Material and methods

The fossiliferous horizons at Serre de Bleyton were repeatedly visited by one of us (G.M.) during the course of several years. Larger fossils were picked from the weathered surface directly in the field. Additionally, bulk samples of the bioclastic debris were collected and processed by wet sieving. Fossils were cleaned using an ultrasonic bath and the tenside Rewoquat (LIERL 1992). This treatment resulted in relatively well preserved meso- and microscale fossils. Non-weathered material taken from the horizons, in contrast, proved to be very well lithified and could not be disaggregated by various treatments (hydrogen peroxide, boiling with sodium, petrol, etc.).

The bulk of the studied material is deposited in the collection of the Department of Geology & Palaeontology at the Natural History Museum Vienna, Burgring 7, 1010 Vienna, Austria. Belemnites are stored at the Museum of Natural History “Naturalis”, Leiden, The Netherlands, and asteroids at the Musée de Paléontologie de l’Université de Provence, Marseille, France.

Preliminary biostratigraphic Data

Data from the ammonite (LUKENEDER 2010) and belemnite (JANSSEN 2010) studies in the present volume indicate a typical Barremian, possibly Late Barremian age for locality 2 and an Early Barremian age for the coleoid assemblage of locality 3. The Barremian age is supported by rich ostracod assemblages (BABINOT & COLIN, submitted).

Invertebrate fauna of Serre de Bleyton

Calcareous Algae (charophytes)

Foraminifera (A. ARNAUD, in prep.)

Porifera

Anthozoa (LÖSER 2010, this volume)

Serpulids (M. JÄGER, in prep.)

Bivalvia

Gastropoda (J. GRÜNDEL, in prep.)

Ammonoidea (LUKENEDER 2010, this volume)

Coleoidea (JANSSEN 2010, this volume)

Rhyncholiths (RIEGRAF & MOOSLEITNER 2010, this volume)

Ostracoda (COLIN & BABINOT, submitted)

Decapoda

Brachiopoda (GASPARD, submitted)

Bryozoa (TAYLOR 2010, this volume)

Asteroidea (VILLIER 2010, this volume)

Crinoidea (JÄGER 2010, this volume)

Echinoidea (A. KROH & F.J. KRÜGER, in prep)

Ophiuroidea

References

- ADATTE, T., ARNAUD-VANNEAU, A., ARNAUD, H., BLANC-ALETRU, M.C., BODIN, S., CARRIO, E., FÖLLMI, K.B., GODET, A., RADDADI, M.C. & VERMEULEN, J. (2005): The Hauterivian – Lower Aptian sequence stratigraphy from Jura Platform to Vocontian Basin: a multidisciplinary approach. – *Géologie Alpine, série spéciale «colloques et excursions»*, **7**: 181 pp.
- ARNAUD, H. (2005): The South-East France Basin (SFB) and its Mesozoic evolution. – In ADATTE, T., ARANAUD-VANNEAU, A., ARNAUD, H. et al. (eds): The Hauterivian – Lower Aptian sequence stratigraphy from Jura Platform to Vocontian Basin: a multidisciplinary approach. – *Géologie Alpine (Ser. Spec.)*, «colloques et excursions», **7**: 5-28.
- BABINOT, J.-F. & COLIN, J.-P. (submitted): Barremian ostracodes from the Serre de Bleyton (Drôme, SE France). – *Annalen des Naturhistorischen Museums in Wien, Serie A*.
- GASPARD, D.. (submitted): Juvenile brachiopods from Barremian turbiditic formations «La Serre de Bleyton», Drôme (France). – *Annalen des Naturhistorischen Museums in Wien, Serie A*.
- JÄGER, M. (2010): Crinoids from the Barremian (Lower Cretaceous) of the Serre de Bleyton (Drôme, SE France). – *Annalen des Naturhistorischen Museums in Wien, Serie A*, **112**: 733-774. (this volume).
- JANSSEN, N.M.M. (2010): Barremian invertebrates from Serre de Bleyton (Drôme, SE France): Belemnites. – *Annalen des Naturhistorischen Museums in Wien, Serie A*, **112**: 659-672. (this volume).
- LIERL, H.-J. (1992): Tenside - ihre Verwendung für die Präparation geologisch-paläontologischer Objekte. – *Der Präparator*, **38/1**: 12-17.
- LÖSER, H. (2010): The Barremian coral fauna of the Serre de Bleyton mountain range (Drôme, SE France) – *Annalen des Naturhistorischen Museums in Wien, Serie A*, **112**: 575-612. (this volume).
- LUKENEDER, A. (2010): Barremian ammonoids from Serre de Bleyton (Drôme, SE France). – *Annalen des Naturhistorischen Museums in Wien, Serie A*, **112**: 613-626. (this volume).
- MOOSLEITNER, G. (2007): Winzig, aber sensationell! Meine kleinste Fossilfundstelle. – *Fossilien*, **24/5**: 288-298.
- PASQUINI, C., LUALDI, A. & VERCESI, P. (2004): Depositional dynamics of glaucony-rich deposits in the Lower Cretaceous of the Nice arc, southeast France. – *Cretaceous Research*, **25/2**: 179-189.
- RIEGRAF, W. & MOOSLEITNER, G. (2010): Barremian rhyncholites (Lower Cretaceous Ammonoidea: calcified upper jaws) from the Serre de Bleyton (Département Drôme, SE France). – *Annalen des Naturhistorischen Museums in Wien, Serie A*, **112**: 627-658. (this volume).
- TAYLOR, P.D. (2010): Barremian bryozoans from Serre de Bleyton (Drôme, SE France). – *Annalen des Naturhistorischen Museums in Wien, Serie A*, **112**: 673-700. (this volume).
- VILLIER, L. (2010): Asteroids from Barremian calciturbidites of the Serre de Bleyton (Drôme, SE France). – *Annalen des Naturhistorischen Museums in Wien, Serie A*, **112**: 701-732. (this volume).

