

Measuring of physical and chemical parameters for the same sample on different direction can caused some important points, explained as follows; Density, Electrical Resistivity, Magnetic Susceptibility and ED-XRF chemical element analyses can give different results belong to sedimentary matrix linearity by particle shape and shear linearity from basin deformations, different water currents, mass gravitational movements, and also by rectifier effect of earth's paleomagnetic remnants and lab measurements under effect of today's magnetic North direction.

2. Integrated stratigraphy of the Agrío Formation (Neuquén Basin, Argentine Andes): Towards an intercalibration with the Tethys during late Valanginian-Hauterivian times

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The Valanginian and Hauterivian stages were periods of transition between the relatively cold late Jurassic and a greenhouse world which continued in the rest of the Cretaceous, and the world seemed to have distinct climate zones, which are reflected in distinct Boreal, Tethysian and Austral marine biotas. However, the duration of these stages is presently under debate, and their numerical ages are also poorly constrained. These uncertainties have hindered efforts to correlate and calibrate different ammonoid zonation of the Boreal and Austral realms with the «standard» Tethysian Mediterranean region zonation as well as the bioevents of nannofossils markers.

To tackle these and other early Cretaceous topics we are studying the Agrío Formation of the Neuquén Basin in west-central Argentina. This basin is a retro-arc basin developed in a normal subduction segment at the foothills of the Andes. Extensive and laterally continuous outcrops and a rich fossil record, combined with ash fall tuffs interbedded in thick, expanded sedimentary successions make the basin an excellent site for stratigraphical, paleontological, and radio-isotopic studies. The infill of the basin during the late early Valanginian to the late Hauterivian is represented by the Agrío Formation. We have studied this unit for more than 20 years with bed-by-bed collection of macrofossils and samples for microfossils and more recently we started sampling the tuff layers. Presently, there are four high precision CA-ID TIMS U-Pb radio-isotopic ages which are well constrained biostratigraphically by ammonoids and calcareous nannofossils. The oldest one is 130.39 ± 0.16 Ma (early Hauterivian), the second is 129.09 ± 0.16 Ma (base of late Hauterivian), the third one is 127.42 ± 0.15 Ma (late Hauterivian) and the fourth is 126.97 ± 0.15 Ma (late Hauterivian). We selected a stratigraphic section at the locality El Portón where this formation is nearly 700 metres thick and represented by its three members. The lower or Pilmatué and upper of Agua de la Mula members are both marine and composed of marl-limestone alternations, likely forced by orbital cycles. The non-marine Avilé Member in between is represented by lutites and sandstones deposited in an ephemeral lacustrine and fluvial environment and it is connected to a short episode of shallowing related to a forced regression.

We performed magnetic susceptibility measurements in both the Pilmatué and Agua de la Mula Members, having obtained the first orbital time scale of the Agrío Formation.

Thus, we achieved a robust combination of biostratigraphy, cyclostratigraphy and high-precision radio-isotopic ages for the Agrío Formation and these data were correlated with those of classic sections of the Tethys, including the candidates for the base of the Hauterivian (La Charce, France) and the base of the Barremian (Río Argos, Spain).

Neuquén Basin Tethys

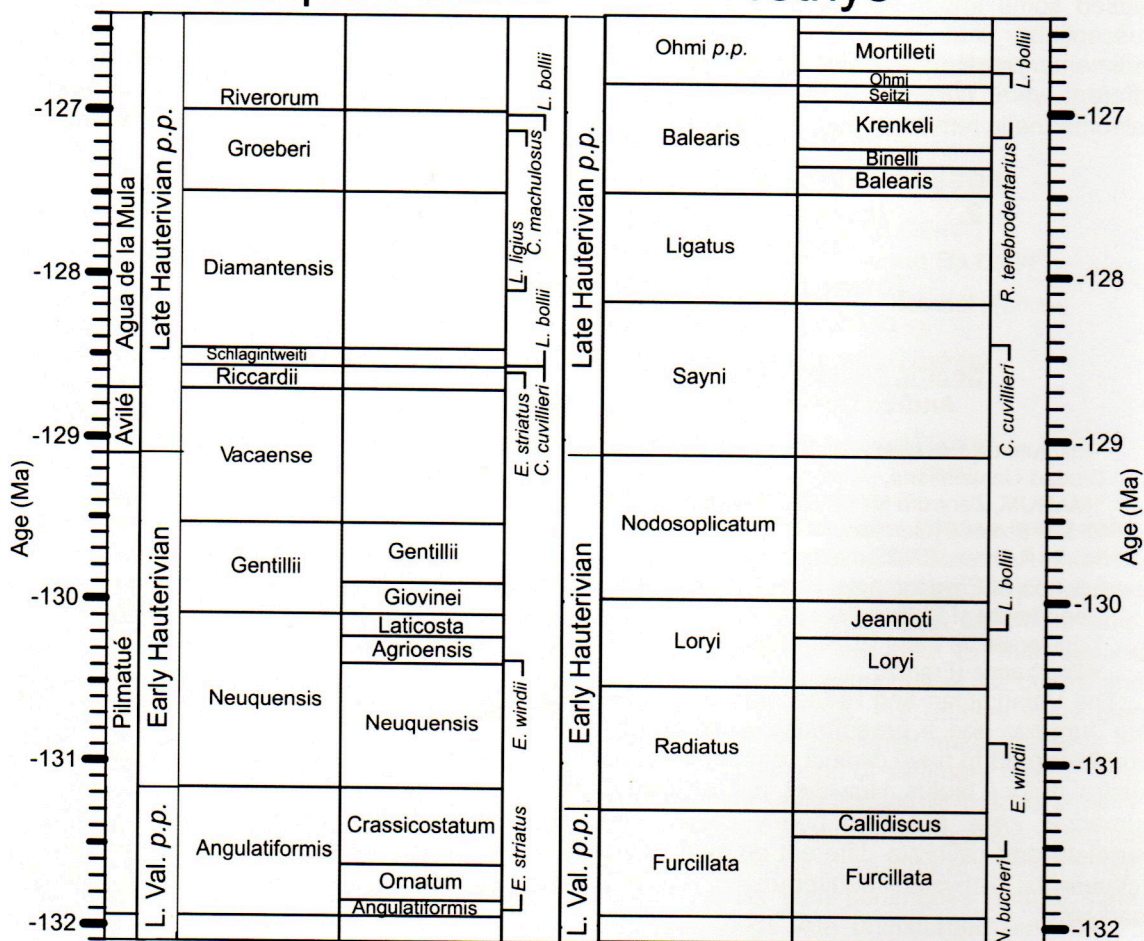


Figure 1 : Correlation chart of the late Valanginian-Hauterivian ammonoid zones and calcareous nannofossil bioevents of the Neuquén Basin and the Tethysian Mediterranean area.

The astrochronological framework provided here gives an opportunity to independently assess the calibration of the ammonoid zones and the nannofossils bioevents in the Neuquén Basin with the «standard» chronostratigraphy in the Tethysian Mediterranean area.

3. Basin evolution model for the late Jurassic-Early Cretaceous interval in the NE Arabian Plate, Kurdistan region- NE Iraq

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The studied area is located in the southwestern part of Zagros fold and thrust belt, specifically in Kurdistan region-NE Iraq. Our research intended to constrain the basin evolution in the western segment of Neo-Tethys (Kermanshah basin) during the late Jurassic-early Cretaceous interval, as well as the characteristics of both the Tithonian-Berriasian and the Berriasian-Valanginian boundaries. With the use of stratigraphy (age determination and fundamental tectonostratigraphic methods), we have tried to constrain the basin models during this period. Nannofossil analyses were used for the biostratigraphic approach.