

## **Integrated Biostratigraphy of the Cenomanian-Turonian Boundary in Morocco**

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An integrated biostratigraphic zonation of the Moroccan Cenomanian-Turonian boundary is proposed from the distribution of the main paleontological groups: ammonites, planktic and benthic foraminifers, ostracodes and inoceramids. This new zonation is compared with the standard zonation (GSSP) of the Western Interior, USA (Bengtson [compiler], 1996) and allows a good correlation with the European zonation and with the major events described in the chart of the European basins published by Hardenbold (1998).

Ammonites characterise the time interval between the lower part of the Upper Cenomanian and the Upper(?) Turonian. The *Vascoceras* gr. *cauvini* zone records the Uppermost Cenomanian, and the *Watinoceras* zone, the Lowermost Turonian.

Planktic foraminifers are also representative. The last occurrence of *Asterohedbergella asterospinosa* points out the Uppermost Cenomanian, and the first occurrence of *Helvetoglobotruncana helvetica*, the Lowermost Turonian. The *Archaeocretacea* zone covers the Cenomanian-Turonian boundary.

Two biozones are defined by benthic foraminifers: the *Thomasinella punica* zone in the Cenomanian, divided in three sub-zones with the *Spirocyclus atlasica* sub-zone in the Uppermost Cenomanian, and the *Gabonita levis* zone in the Turonian.

Two ostracodes biozones are proposed: the *Reticulocosta boulhafensis* one in the Cenomanian, linked with the *Dolocysteridea atlasica* abundance biozone in the Upper Cenomanian, and the *Spinoleberis yotvataensis* biozone in the Turonian. Moreover, the *Reticulocosta* gr. *Tarfayaensis* abundance biozone is very important for the Cenomanian-Turonian boundary.

The different species of inoceramids allow to recognize some Cenomanian-Turonian events.

These new biostratigraphic data are further arguments to place with precision the Cenomanian-Turonian boundary in Morocco, and make more complete the standard zonation edited by Hardenbol et al. (1998) for this cross point between the Atlantic and the Tethyan Oceans.

Key Words: Cenomanian-Turonian Boundary, Biostratigraphic Zonation, Morocco.