

CONSTRAINING THE ONSET OF SUBDUCTION THROUGH SEDIMENT PROVENANCE CHANGES: THE CEHLĂU-SEVERIN OCEAN OF THE EASTERN CARPATHIANS

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The Ceahlău-Severin Suture (CSS) is part of the Alpine Eastern Carpathians orogen bounded to the west by the thick-skinned Getic-Bucovinian nappe system (Dacia mega-unit) and to the east by the thin-skinned nappes of the Moldavides tectonic unit system. The Ceahlău-Severin Ocean opened due to Middle Jurassic – Early Cretaceous extension which separated the Dacia Block from the European realm, a collage of the Moesian (including the Danubian unit), the East European Platform, and the North Dobrogea Orogen. The extension led to the development of a deep and narrow marine basin floored by a hyperextended continental and oceanic crust. On the margins of the extensional basin, deep-water sediments (i.e., the Sinaia Formation) accumulated during Tithonian – Hauterivian times. Previous studies (Lăzărescu and Dinu 1983), suggested that the turbidites of the western margin (the upper plate with respect to the later subduction system) were subsequently incorporated into the CSS during the Late Cretaceous. Barremian – Lower Aptian deep-water sediments are documented but it is not clear in which tectonic settings their deposition took place. Quantitative provenance studies could provide a clue regarding the syn-compressional regime of sedimentation, thus constraining the onset of subduction. U-Pb detrital zircon (DZ) data of two pilot samples taken from the northern and southern areas of the Sinaia Formation indicate a dominant westerly source (i.e., the Dacia mega-unit), yielding ages between 430 and 600 Ma. Age peaks of ~310 Ma and ~600 Ma suggest their probable provenance from the Danubian Unit, especially in the southern

sector of CSS. The provenance of the Sinaia Formation sediments, therefore, provides potential evidence for deposition prior to the convergence involving sources situated on both margins of the extensional basin (Danubian to the south and east and Dacia to the west). Albian deposits from the units of the Outer Moldavides nappes have an easterly source, (post-Variscan magmatic, Neoproterozoic, and Archaic DZ), except for the innermost Moldavides nappe (Teleajen), where DZ reveal a predominately westerly Dacia origin (Ordovician peak at 460 Ma). This finding suggests that at least during the Albian, subduction had already been initiated. A similar provenance (i.e., Dacia block) of Barremian-early Aptian deep-water clasts based on the next U-Pb data (DZ) could indicate a pre-Albian onset of convergence.

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THE LATE CENOMANIAN PLENUS EVENT IN THE WESTERN INTERIOR SEAWAY, USA/CANADA

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The Plenus Cold Event (PCE) is one of the most enigmatic paleoclimate episodes in Earth's history and has potential to inform our understanding of global climate system variability under greenhouse warming conditions, as well as internal feedbacks that modulate such variability (Jenkyns et al. 2017; O'Connor et al. 2020). Following an interpreted massive addition of