Early Jurassic opening of the Alpine Tethys in Romania established a passive margin (Moldavide basin) on the distal part of the East European Plate. The passive margin sedimentation prevailed during the Late Jurassic and Early Cretaceous, and then markedly changed by the mid Cretaceous with the closure of the Alpine Tethys. Initiation of the Carpathians subduction and then the shortening transformed the Moldavide passive margin basin into a foredeep basin located on the lower plate of the Carpathians. We have studied the Cretaceous deposits from the external nappes of the Eastern Carpathians (Moldavides; Săndulescu, 1984) represented by Valanginian–late Albian black shales (BS) and late Albian- Turonian Cretaceous Oceanic Red Beds (CORB) (Hu et al., 2012). The transition from BS to CORB is not synchronous in the Moldavide Nappe system. In the Outer Moldavides, the CORB started in the Early Turonian, while in Inner Moldavides is known from the Albian-Cenomanian boundary. The BS accumulated on the passive margin, part of an abyssal area of a narrow and deep basin, characterized by anoxic, suboxic and dysoxic paleoenvironments. Among the black shales with thin turbidites some sandy high density turbidites may be found in the Albian. In turn, the CORB accumulated in a deep, but oxic palaeoenvironment as indicated by benthic microfauna. The Albian also features some global anoxic events including the late Albian OAE1d. The asynchronous BS-CORB transition along with different lithological features suggests the presence of Aptian-Cenomanian intrabasinal highs (cordilleras) that divided the Moldavide basin into several small sub-basins with slightly different sedimentation. We interpret the cordilleras as inversion features triggered by the initiation of the closure of the Alpine Tethys. The Early Cretaceous black shales have moderate to good hydrocarbon source rock properties. Some of the outcrop samples display oil window thermal maturities. Better understanding of the facies distribution and maturation history of the black shales could shed lights on the poorly known Cretaceous petroleum system of the Eastern Carpathians.

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References