

Mesozoic development stages of the NW margin of the Black Sea

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The paper presents the main development stages of the north-western Black Sea margin, covering three main tectonic units: the Predobrogea Depression, the North Dobrogea Orogen and the East Moesian Platform. The evolution of these areas is illustrated in a set of thickness and lithofacies pattern maps, based on analysis of lithofacies and sediment thicknesses from logs of exposures and boreholes.

In the Early Jurassic, the E-W extension that led to the formation of the Permian – Early Triassic graben of the Predobrogea Depression and to the development of the Middle-Late Triassic passive margin of the East European Craton suddenly ceased and the craton margin was uplifted and subjected to erosion. The Middle Jurassic stage in the Predobrogea basin evolution is characterized by intense subsidence due to widespread extension, consequently to NNW-SSE stretching of the craton margin in conditions of extensional/strike-slip regime. The Bathonian transition from strike-slip to compressional regime accompanied by a sinistral strike-slip component is related to the last phase of evolution of the Cimmerian North Dobrogea orogen. It seems likely that the extensional/strike slip stress regime responsible for the strike-slip component near the Peceneaga-Camena Fault could determine the Late Jurassic sedimentary conditions of the Moesian Plate near this fault.

Basin shallowing in late Lower Kimmeridgian was followed by Cretaceous sedimentation on a shallow marine carbonate platform established since the Late Tithonian in the eastern part of the Moesian Platform. Active lateral facies changes suggest activity along the Capidava-Ovidiu Fault during the Berriassian-Valanginian. The fault was active through the Middle-Late Aptian, controlling the deposition of dominantly continental, fluvial-lacustrine sediments in detrital and kaolinitic clayey facies. Almost the entire area of Dobrogea became emerged, bordered eastward by the shallow marine environments of the incipient Black Sea Basin.

During the Albian, South Dobrogea was part of a shallow shelf, while Black Sea basin turbiditic deposits accumulated in the narrow Histria rifted basin. Starting with Lower Cenomanian, shallow marine sediments transgressed over the entire area of Dobrogea.

The paleogeographic interpretation for the Aptian to Late Cretaceous is consistent with the SE extension of Dobrogea, compatible with the rifting of the western Black Sea basin as suggested by paleostress data.