Structural analysis of faults related to the Late Cretaceous and Paleocene evolution of the Central Srednogorie zone, Bulgaria

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The Panagyurishte strip of Central Srednogorie zone, Bulgaria is part of the peri-Tethyan Upper Cretaceous Apuseni-Banat-Timok-Srednogorie magmatic arc belt and it is famous for its rich copper-porphyry and epithermal systems. The magmatic events related to the formation of the known ore systems are dated in the interval of 93–85 Ma and were followed by a period of deposition of carbonate and sandy turbidites during the latest stages of the Cretaceous and Paleocene. The main deformational event of the Central Srednogorie zone occurred after the Maastrichtian due to the closure of the arc basin and affected not only the Upper Cretaceous sequences (including the ore systems) but also the fragments of the Early Alpine edifice.

The present study is focused on the structural analysis of several regional faults that affected the Mesozoic (Triassic and Late Cretaceous) sequences in different parts of the Panagyurishte strip. The study of the post-ore deformations is important to reveal the history and current position of the ore bodies and their host rocks.

Most of the documented faults follow the main NW-SE to W-E orientation of the Panagyurishte strip. They do not represent single discrete fault surfaces but usually are segmented and the fault zones are several tens to hundreds of meters wide, often complicated by the presence of imbricate structures. Some of the faults involve rocks from the crystalline basement but most of the documented structures juxtapose different parts of the Mesozoic sequences. The deformation is brittle in almost all lithological varieties to brittle-ductile in some of the clayey limestones and turbidites at macroscopic view. Both evidence for compressional and dextral strike-slip tectonics are documented as slickenside fibres, geometry of Riedel shears and folds, lithological markers. It is difficult to distinguish them in time as no stratigraphic reference units, overprinting relationships or structural interferences between them are observed. In the different parts of the basin, either compression or strike-slip deformation are dominant. This fact, as well as the echelon configuration of the faults support the idea for their synchronous development in dextral transpressional setting and reactivation in time of the older transtensional structures that controlled the opening of the Late Cretaceous basin.
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