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Carboniferous to Cretaceous rift and accretion history of western Central Iran and Sanandaj-Sirjan zone: evidence from metamorphic basement complexes

Presenting author underlined, Authors and numbered affiliations, Times New Roman, 9 points]

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We review extensive new geochronological data sets of particularly Ar-Ar mineral ages combined with petrological, structural and microfabric studies from various metamorphic basement units of western Central Iran and the Sanandaj-Sirjan zone (SSZ). The results give new insights in the long-term tectonic history of that segment of the Alpine-Himalayan orogenic belt. In that region, the rift and accretion history of Paleotethyan and Neotethyan oceans are overlapping each other in time and partly in space implying that the Sanandaj-Sirjan zone as active continental margin was not individualized before Middle Jurassic and separation of Paleotethyan/Cimmerian processes from Neotethyan processes remains elusive.

Within SSZ, we recognize a Carboniferous stage of rift metamorphism potentially leading to back-arc spreading and resulting in the opening of the Paleotethys ocean. On the other hand, subduction resulted in the Middle-Late Triassic to Early Jurassic closure of the Paleotethys ocean forming a metamorphic collision belt, which was then extensively overprinted by Jurassic ductile transpressional shearing potentially during a stage of S-directed extrusion. This stage similarly affected also major parts of the SSZ transforming it to the linear belt within which Middle-Late Jurassic subduction-related plutons intruded above the initiating Neotethyan subduction zone. Western Central Iran stabilized during Early Cretaceous and is then overlain by platform-type sediments. In contrast, subduction and accretion of metamorphic terrains heralded continental microplate accretion along the SSZ during late Early Cretaceous (130 – 100 Ma) and Late Cretaceous (80 – 70 Ma) a long time before final closure of the Neotethys ocean during Oligocene (30 +/- Ma).