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Tectonic and geochronology of the Rehamna massif (Morocco) in the frame of the Alleghanian-Variscan orogeny

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The Rehamna massif is situqted in the Morocco variscan belt, where there is a strong lack of modern geochonological datas. Furthermore, the timing and mode of formation of this massif remains highly debated. In a form of a metamorphic by weakly metamorphosed supracrustal units, its core presents amphibolite facies rocks pervasively deformed.
In this study, are presented the structural pattern of the dome and the timing of its growth, in conjunction with syn- to late- variscan magmatism. According to this structural and 40Ar/39Ar geochronological study, a new tectonic model is proposed for this part of the orogen. It is then replaced at the orogenic scale.
The first tectonometamorphic record is a SW-SSW vergent nappe stacking. In the core of the dome, it is expressed by top-to-the-south intense shearing in subhorizontal fabrics associated with prograde barrowian metamorphism, where it can reach the Std stability field within early Cambrian to Devono-Carboniferous metasedimentary rocks (Central and Eastern Rehamna), forming the orogenic infrastructure. Upon it, this SSW directed shortening is also well visible, developing an $\sim$ E-W trending overturned anticline made of Lower Palaeozoic supracrustal sediments. This event, older than 295 Ma, is then associated with syn-convergent buckling and exhumation of the formerly orogenic infrastructure, whereas superstructure is detached from it.
Then, an WNW-ESE shortening is responsible for an heterogeneous deformation orthogonal to the previous one. In the Central Rehamna, this superposition is marked by the development of a circular subdome, the folding of isograde and development of subvertical clivage for which the intensity increases in front of the westward rigid Cambrian coastal block. More easterly, in the deeper part of the Eastern Rehamna, the Devono-Carboniferous metasedimentary rocks experienced heterogeneous reworking marked by localized NNE-SSW subvertical to moderaly dipping clivage. Associated metamorphic fabrics ages cluster at 280-290 Ma which is similar to syn-tectonic intrusion dated at 285 Ma. Post-variscan magmatism is finally dated at $\sim$ 275 Ma.
Those events are integrated into the Alleghanian−Variscan Orogenic frame. At 310-295Ma, dextral translation dominates at the Laurentia boundary whereas Europe and Gondwana suffers a more head-on collisional tectonic regime due to Ural collision. After 295 Ma, NW Gondwana and Laurentia show large head-on tectonic with fold and thrust belt architecture, whereas in the same time, the Europe segment of the belt record late shearing along strike and orogenic collapse leading to the final stabilization of the orogenic crust.