

Tectonic stages in Southern Greater Caucasus and Adjara Trialeti belt in Georgia: new results on timing and structures of inverted basins

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The Greater Caucasus mountain belt is the result of a long live subduction process and collisions of continental microplates (e.g. Dercourt et al., 1986; Barrier and Vrielynck, 2008). The northward subduction of Tethys beneath Eurasian plate initiated a back-arc basin: the Greater Caucasus basin (e.g. Adamia et al., 1981; Zonenshain and Le Pichon, 1986; Roberston et al., 1996; Stephenson and Schellart, 2010 among others). It took place from Middle Jurassic to Late Cretaceous. First compression stage started at the end of Cretaceous in the Lesser Caucasus (e.g. Rolland et al., 2010; Sosson et al. 2010, 2016) and Palaeocene-early Eocene in Crimean Mountains (northwestern continuation of the Greater Caucasus) (Sheremet et al., 2016). In southern Greater Caucasus (Georgian area) the age of deformation during the beginning of the collision is still a subject of debate: Oligocene-Lower Miocene at the frontal part (e.g. Adamia et al. 2010) or Eocene (Mosar et al., 2010). The deformation continues at Miocene, Pliocene and actual time in Kura and Rioni foreland basins (Forte et al., 2010; 2013; Mosar et al., 2010). The different timing is interpreted to be the result of the Taurides-Anatolides-South Armenian microcontinent collision with Eurasia, followed by the collision with Arabia. During the first collision, during Paleocene-Eocene, the so-called Adjara-Trialeti basin opened north of the volcanic arc. One question is if this local extension affect the timing of compression observed in the Greater Caucasus or not.

In Georgia, we investigated new structural analyses, and considered unconformities and growth strata at the frontal part of deformations in Kura and Rioni forelands basins (in front of the Greater Caucasus). Our results evidence different tectonic stages and their timing. In Adjara-Trialeti, Kura and south Rioni basins deformation starts at Middle-Late Miocene. In northern Rioni basin Upper Cretaceous-Lower Paleocene compression is evidenced.

The structures observed in the Greater Caucasus, forelands basins (Kura and Rioni basins) and in the Adjara-Trialeti belt are different: some are linked to thin-skinned tectonic deformations while some induces deformation at depth (thick-skinned tectonic). These observations outline the role of the inherited structures within the basement. The normal faults due to the previous extensional stages are reactivated as thrust during collision while detachment levels are observed in deposits not involved in the extensional stages.

These observations bring out the importance of the chronology of the different tectonic stages to better understand the tectonic frame and geodynamic processes involved from the Early Cretaceous in this area and the role on the resulting structures.