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Petrological and structural observations on mylonitized intermediate and felsic rocks within the ophiolitic formation of Vrinena - East Othris, Greece.

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The ophiolitic formation of Vrinena appears in east Othris and despite its relatively small exposure it includes most members of a complete ophiolitic sequence. This ophiolitic formation was tectonically emplaced in the form of imbricated nappes above variably recrystallized Middle to Upper Jurassic carbonates. Marbles and recrystallized carbonates are also found tectonically intercalated within the thrust sheets. In addition, the ophiolitic formation is trangressively overlain by Upper Cretaceous conglomerates, limestones followed by Paleocene flysch[2],[3],[4].
At the southeastern part of the ophiolitic formation mylonitised intermediate and felsic rocks have been found in tectonic contact with the underlying Jurassic carbonates. These rocks are deformed by shear zones which seem to be directly linked with the emplacement of the ophiolitic formation above the Jurassic carbonates. Weakly deformed rocks with similar composition, found in proximity to the mylonitized rocks, have been classified on the basis of petrography and bulk-rock geochemistry as diorites, doleritic andesites and plagiogranites[2]. Sea-floor hydrothermal alteration and metasomatism has had a significant effect upon all intermediate and felsic rocks of the ophiolitic formation. This is confirmed by the presence of prehnite, chlorite, sericite, epidote, pumpellyite, secondary amphiboles and in the case of rodingites by grossular[1],[2],[4]. Mineral assemblage of the mylonitised intermediate rocks includes Ab + Ep + Cpx + Chl + Act + Ser + Bt + Mus + Preh + Qz + Cc, whereas the mylonitised felsic rocks include Qz + Ab+ Ep + Chl + Mus + Ser. Some of these minerals have most likely been inherited from the referred alteration processes. These rocks display heterogeneous deformation and can be characterized either as protomylonites or mylonites. Intermediate mylonites include zones with highly deformed and recrystallized chlorite + epidote + biotite mainly surrounding highly altered clinopyroxene and albite porphyroclasts. Felsic mylonites include quartz + mica aggregates surrounding albite porphyroclasts, which present noticeable deformation twinning. Most plagioclases have been replaced mainly by sericite. Deformation structures and mineral assemblages indicate that mylonitization took place at estimated temperatures ranging from 350 to 400°C with moderate pressure conditions. The absence of hornblende in the compositionally intermediate mylonites indicates that ophiolite emplacement may have not exceeded greenschist facies conditions.

References
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