

Multiple metamorphic events recorded in kyanite-andalusite gneisses from Parvenets complex, Thracian lithotectonic unit, Bulgaria

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Parvenets metamorphic complex comprises the northernmost parts of the Central Rhodope Mts and was attributed by different authors both to the Rhodope Massif and the Srednogie Zone. According to Sarov [1], the Parvenets complex is part of the Thracian lithotectonic unit, which consists of varying in age and origin rocks, affected by the Maritsa dextral strike-slip shear zone. New structural and geochronological data revealed polymetamorphic history of the Parvenets complex. High-grade, Late Carboniferous (303.7 ± 3.3 Ma), metamorphism in amphibolite facies was recorded in kyanite-andalusite gneisses [2-4]. A later, superimposed greenschist facies metamorphism at 77.5 ± 3.2 Ma, coincides with the intrusion of Late Cretaceous plutons in the Thracian lithotectonic unit [4].

In this study, we give new data for U-Pb zircon geochronology in the kyanite-andalusite gneisses. The zircon grains are rounded ($> 50 \mu\text{m}$) and included in plagioclase and in the matrix. The grains experienced long transport and reburial, evidenced by rounded shape, cracks and irregular core to rim structure. On CL images zircon grains have small bright to dark resorbed cores, rarely with ghost oscillatory zoning (one analysis yielded a concordant age of 497.2 ± 120 Ma). Homogeneous gray thick metamorphic rims of zircons, included in plagioclase, yielded a concordant age of 342.1 ± 8.4 Ma (four analyses, MSWD = 0.81), as previously reported ages of high-grade Variscan metamorphism in the Srednogie Zone. Younger ages for metamorphic rims of matrix zircons, from 297 to 318 Ma (three analyses), are similar to the ages of monazite inclusions, and are typical for lower high-grade units of the Rhodope Massif. This new geochronological data confirm that the Parvenets complex records multiple metamorphic events and has an unique tectonometamorphic evolution.

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