



## **Permo-Carboniferous and upper Jurassic basement ages in the Kerdillion Unit, eastern Serbo-Macedonian Massif, northern Greece**

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The Serbo-Macedonian Massif (SMM) is a large basement complex in the Internal Hellenides of northern Greece. Extensive field and laboratory work has revealed that the eastern part of the SMM, the Kerdillion Unit, bears little resemblance in terms of structures, rock-type, geochemical and isotopic characteristics, and primary intrusion ages to the rest of the massif. Instead, the Kerdillion Unit is very similar to the basement units of the adjacent Rhodope Massif.

The rocks of the Kerdillion Unit are strongly deformed biotite-gneisses, which form several large gneiss domes and are lithologically homogeneous throughout the area. The trace-element patterns suggest that the rocks are orthogneisses that have originated in a magmatic-arc setting. The  $^{87}\text{Sr}/^{86}\text{Sr}$  initial ratio calculated with the zircon ages is 0.706, indicating little crustal influence in the magma. This supports the notion that the precursor rocks are I-type granitoids generated at an active continental margin. However, crystallization ages, produced by the Pb-Pb and U-Pb (SHRIMP) methods, indicate that the Kerdillion Unit is not as homogeneous as it seems to be lithologically, but reflects three distinct pulses of magmatism in the Permo-Carboniferous (280 - 309 Ma), late Jurassic (142 - 160 Ma) and early Tertiary (47 - 72 Ma). This is interpreted as repeated magmatism at an active continental margin. This active continental margin witnessed repeated subduction of oceanic crust related to the closure of various Tethyan basins and amalgamation of terranes with the southern European margin.

The gneisses of late-Jurassic age build the majority of the Kerdillion Unit and are considered to be the major magmatic event of the area. The precursor granites of this age intruded into a pre-existing Permo-Carboniferous magmatic arc. The early Tertiary granites intrude in the vicinity of large-scale fault zones such as the Strimon fault zone. These granites also show little deformation, which indicates that they post-date the regional deformation event. However, they are related to the early-Tertiary exhumation of the Kerdillion Unit, which also caused the migmatization of the biotite gneisses of the Kerdillion Unit.

We propose that the Kerdillion Unit is not part of the SMM as previously considered but instead the western promontory of the Rhodope Massif as indicated by lithology, structures, crystallization ages and isotope geochemistry. The Vertiskos Terrane, which is the crustal unit in the western part of the SMM is mainly built by Silurian orthogneisses and therefore different from the Kerdillion Unit. The mafic and ultramafic rocks of the Athos-Volvi Zone, which mark the border between the Kerdillion and the Vertiskos Units, are interpreted as representing the suture between the two continental blocks which were accreted to the Hellenic orogen during closure of the Paleotethys during the late Jurassic.

#### References

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