



## Research article

## U–Pb geochronology and Hf isotope data from the Late Cretaceous Mawat ophiolite, NE Iraq



Heider Al Humadi <sup>a,b,\*</sup>, Markku Väisänen <sup>a</sup>, Sabah A. Ismail <sup>c</sup>, Jaakko Kara <sup>a</sup>, Hugh O'Brien <sup>d</sup>, Yann Lahaye <sup>d</sup>, Marja Lehtonen <sup>d</sup>

<sup>a</sup> Department of Geography and Geology, 20014 University of Turku, Finland

<sup>b</sup> Department of Applied Geology, College of Sciences, University of Babylon, Iraq

<sup>c</sup> Department of Applied Geology, College of Sciences, University of Kirkuk, Iraq

<sup>d</sup> Geological Survey of Finland, 02151 Espoo, Finland

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## ABSTRACT

The Mawat ophiolite, NE Iraq, is one of the Neo-Tethyan ophiolites within the Iraqi Zagros orogen. It consists of many metre-to kilometre-sized tectonic slices of serpentinized dunite, peridotite, gabbro, basaltic rocks and associated oceanic metasediments. Felsic intrusions crosscut the ophiolite. We present U–Pb zircon and monazite ages and Hf zircon isotopes from two crosscutting felsic dykes and a gabbro from the mantle section of the ophiolite. Zircons from the felsic dykes contain spongy domains and xenotime and monazite inclusions. They give ages from 222 to 46 Ma. The age range is interpreted to be caused by secondary processes such as radiogenic Pb mobility and Pb loss. The monazite age of  $94.6 \pm 1.2$  Ma is considered to give a crystallisation age of the felsic dykes. The gabbro zircons give ages between 81 to 38 Ma of which the two oldest grains give the weighted average age of  $81.2 \pm 2.5$  Ma which we interpret to be the crystallisation age of the gabbro. The zircon initial  $\epsilon_{\text{Hf}}$  values in the felsic dykes are negative (averages -2.7 and -3.1) while they in the gabbro are positive (average +3.5), indicating that the felsic magma comes from an older source while the mafic magma comes from a juvenile one. Two mafic units of different ages were identified: the older unit is cut by the 95 Ma felsic dykes and the younger one is represented by the 81 Ma gabbro located within a thrust zone. The youngest ages of 40 Ma are considered to be related to crustal extension.