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Age and Tectonic Setting of the Aoyougou-Erzhihaladaban Ophiolite in the Western North Qilian Mountains, NW China

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Abstract

Abstract: The Aoyougou-Erzhihaladaban ophiolite is one of the representative ophiolite fragments in the west sector of the North Qilian orogenic belt. Using sensitive high resolution ion microprobe (SHRIMP), two samples from this area were dated. A fine-grained gabbro sample from the Aoyougou section has consistent apparent $^{206}Pb/^{238}U$ ages in the range of 490 to 508 Ma with a weighted mean age of 501 ± 4 Ma (MSWD=1.09), whereas a dolerite sample from the Erzhihaladaban section has a relatively younger $^{206}Pb/^{238}U$ age of 495±4 Ma (MSWD=0.98). Combined with detailed field examination, mineral and whole-rock chemical study, we conclude that the exposed Aoyougou-Erzhihaladaban ophiolite represents a part of the dismembered North Qianlian oceanic crust of the era. In addition, the authors propose that the voluminous basalts interstratified with carbonates and mudstones of the Neo-Proterozoic Zhulongguan group do not belong to the Aoyougou-Erzhihaladaban ophiolite. Instead, they may be continental flood basalts formed as a result of break-up of the Rodinia supercontinent.