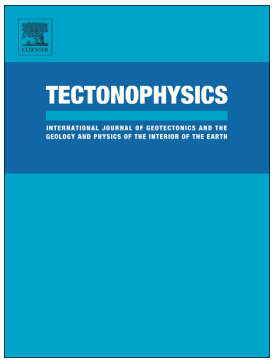

Mesozoic strike-slip movement of the Dunhua–Mishan Fault Zone in NE China: A response to oceanic plate subduction

Cheng Liu, Guang Zhu, Shuai Zhang, Chengchuan Gu, Yunjian Li, Nan Su, Shiye Xiao

PII: S0040-1951(17)30527-9
DOI: https://doi.org/10.1016/j.tecto.2017.12.024
Reference: TECTO 127731

To appear in: *Tectonophysics*

Received date: 30 August 2017
Revised date: 18 December 2017
Accepted date: 27 December 2017

Please cite this article as: Cheng Liu, Guang Zhu, Shuai Zhang, Chengchuan Gu, Yunjian Li, Nan Su, Shiye Xiao , Mesozoic strike-slip movement of the Dunhua–Mishan Fault Zone in NE China: A response to oceanic plate subduction. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Tecto(2017), https://doi.org/10.1016/j.tecto.2017.12.024

Mesozoic strike-slip movement of the Dunhua–Mishan Fault Zone in NE China: A response to oceanic plate subduction

Cheng Liu, Guang Zhu*, Shuai Zhang, Chengchuan Gu, Yunjian Li, Nan Su, Shiye Xiao
School of Resource and Environmental Engineering, Hefei University of Technology, Hefei, China

* Corresponding author.
E-mail addresses: liu4686382@163.com (C. Liu), zhuguang59@hotmail.com (G. Zhu), szhang@mail.hfut.edu.cn (S. Zhang), guchengchuan15@163.com (C. C. Gu), yunjianfei_hfut@126.com (Y. J. Li), 403931219@qq.com (N. Su), 97354278@qq.com (S. Y. Xiao)

ABSTRACT

The NE-striking Dunhua–Mishan Fault Zone (DMFZ) is one of two branches of the continental-scale sinistral Tan–Lu Fault Zone in NE China. The field data presented here indicate that the ca. 1000 km long DMFZ records two phases of sinistral faulting. The structures produced by these two phases of faulting include NE–SW-striking ductile shear belts and brittle faults, respectively. Mylonite-hosted microstructures and quartz *c*-axis fabrics suggest deformation temperatures of 450°C–500°C for the ductile shear belts. Combining new zircon U–Pb dates for 14 igneous rock samples analyzed during this study with the geology of this region indicates these shear belts formed during the earliest Early Cretaceous. This phase of sinistral displacement represents the initial formation of the DMFZ in response to the northward propagation of the Tan–Lu Fault Zone into NE China. A phase of Early Cretaceous rifting was followed by a second phase of sinistral faulting at 102–96 Ma, as evidenced by our new U–Pb ages for associated igneous rocks. Combining our new data with the results of previous research indicates that the DFMZ records a four-stage Cretaceous evolutionary history, where initial sinistral faulting at the beginning of the Early Cretaceous gave way to rifting during the rest of the Early Cretaceous. This was followed by a second phase of sinistral faulting at the beginning of the Late Cretaceous and a second phase of local rifting during the rest of the Late Cretaceous. The Cretaceous evolution of the DMFZ records the synchronous tectonic evolution of the NE China continent bordering the Pacific Ocean. Two phases of regional N–S compression generated the two phases of sinistral faulting within the DMFZ, whereas two-stage regional extension generated the two phases of rifting. The two compressive events were the result of the rapid low-angle subduction of the Izanagi and Pacific plates, whereas the two-stage extension was caused by the roll-back of these respective plates. The final closure of