

Timing of accretion and collisional deformation in the Central Asian Orogenic Belt: implications of granite geochronology in the Bayankhongor Ophiolite Zone

Craig Buchan (buchanc@lithos.curtin.edu.au)

Tectonic Special Research Centre, Department of Applied Geology, Curtin University of Technology, GPO Box 1987, Perth 6845, Western Australia

Jörg Pfänder,

Max-Planck-Institut für Chemie, Abteilung Geochemie, Postfach 3060, D-55020 Mainz, Germany; FAX +49 6131 371 051

Alfred Kröner,

Institut für Geowissenschaften, Universität Mainz, 55099 Mainz, Germany; FAX +49 6131 392 4769

Timothy S. Brewer,

Orogenic Processes Group, Geology Department, University of Leicester, Leicester, LE1 7RH, UK; FAX +44 116 252 3918.

Onongin Tomurtogoo, Dondov Tomurhuu,

Institute of Geology & Mineral Resources, P.O.Box 118, Enkh Taivan Avenue 63, Ulaanbaatar 210351, Mongolia; FAX 976 1 457858

Dickson Cunningham, Brian F. Windley,

Orogenic Processes Group, Geology Department, University of Leicester, Leicester, LE1 7RH, UK; FAX +44 116 252 3918.

Abstract

Growing evidence suggests that the mechanism of Palaeozoic continental growth in Central Asia was by subduction-accretion with punctuated collisions that produced ophiolitic sutures between accreted blocks. The Bayankhongor ophiolite is the largest ophiolite in Mongolia and possibly all of Central Asia, and is interpreted to mark the collisional suture between the Baidrag and Hangai continental blocks. New $^{207}\text{Pb}/^{206}\text{Pb}$ zircon evaporation ages for granite plutons and dykes that intrude the ophiolite and its neighbouring lithotectonic units, suggest that the ophiolite was obducted at *c.* 540 Ma at the beginning of a collisional event that lasted until *c.* 450 Ma. The new data combined with that of previous studies indicate regional correlation of isotopic ages north-westward from Bayankhongor to southern Tuva. These data record oceanic crust formation at *c.* 570 Ma, followed by approximately 30 million years of subduction-accretion that culminated in obduction of ophiolites, collision related metamorphism, and magmatism in the period *c.* 540-450 Ma. Correlation of isotopic-age data for the ophiolites of western Mongolia and southern Tuva suggests that the ophiolites define a major collisional suture in the Central Asian Orogenic Belt that defines the southern and western margins of the Hangai continental block.

Keywords: Central Asian Orogenic Belt, Zircon Geochronology, Mongolia, Ophiolites