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U-Pd zircon ages for the Chinglai gneiss, lower Buner, North Pakistan

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The Chinglai gneiss is a dark-colored medium-grained rock characterized by abundant augen of k-feldspar and plagioclase. It is located on the western limb of the Indus syntaxis. The Chinglai gneiss was initially mapped as part of the Ambela complex (Siddiqui et al., 1968; Rafiq, 1987). The Ambela complex was considered to be late Paleozoic on the basis of whole-rock Rb-Sr (297 $\pm$ 4, 315 $\pm$ 15) and U-Pb zircon (280 $\pm$ 15) ages from the Koga syenite (Le Bas et al., 1987 and Smith et al., 1994 respectively) and the intrusive contact of the Ambela granites with Carboniferous rock of the Jaffar Kandao Formation, where the Chinglai gneiss was also considered Carboniferous in age. Sak and Pogue (1995) and Khan et al. (1990) mapped the Chinglai gneiss as a separate body and is in contact with Ambela granite and the Ambar Formation. They considered the Chinglai gneiss to be of Cambrian age. DiPietro et al. (1999) based on texture and composition similar to Swat gneisses mapped the Chinglai gneiss and the southeastern part of the Ambela complex as part of the Swat gneisses. The Swat gneisses were previously correlated with the Mansehra gneiss that is considered to be late Cambrian on the basis of a whole-rock Rb-Sr age of 516 $\pm$ 16 Ma (Le Fort et al., 1980). Anckeiwicz (1998) obtained U-Pb zircon age of 468 $\pm$ 5 Ma from the Choga granodiorite gneiss and ca. 265 Ma from Ilam body part of the Swat gneiss to be related with late Paleozoic event.

Chinglai gneiss has abundant zircon. A sample from the Chinglai gneiss along the main road from Chinglai-Totalai section was collected for zircon separation. Zircons were separated using standard techniques of crushing, grinding and heavy liquid and magnetic separation. Zircons picked were clear euhedral grains of two morphologies, elongated prisms or stuby prisms. Analyses were performed at the Department of Earth and Atmospheric Sciences, University of Houston, using Laser ablation ICP-MS. Cathodoluminesnce (CL) images of the zircon show zoning and inherited cores (Fig. 1). In total of 17 analyses were carried out on multi grains.

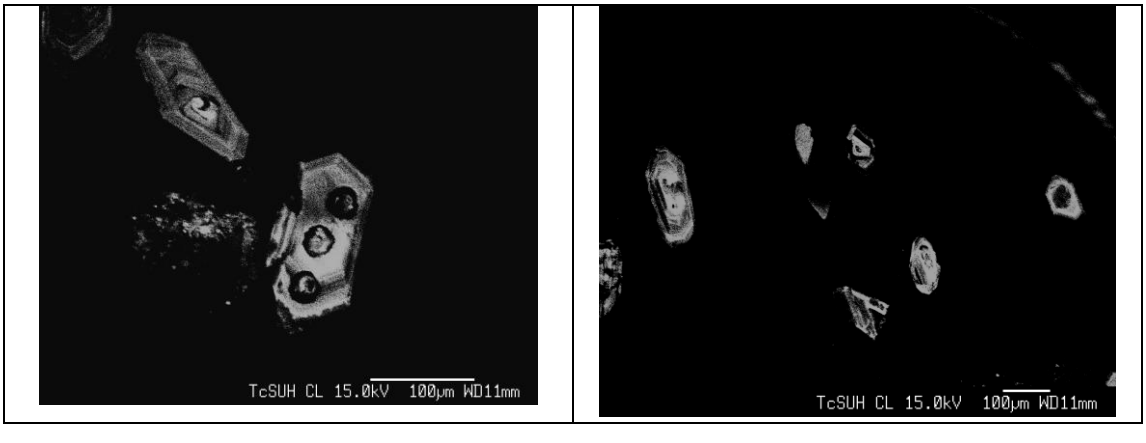

Fig. 1. CL images of the zircon from the Chinglai gneiss show zoning and inherited cores.

The analyses obtained show an upper intercept 827 Ma from the inherited core. This age is in agreement with the Black mountain complex of 823 Ma age (U-Pb zircon, DiPietro and Iscachsen, 2001) in the east of the Chinglai gneiss. The lower intercept of 456 represents a younger Pb loss and/or overgrowth associated with the intrusion in the north, the Choga granodiorite gneiss having U-Pb zircon age of 468 $\pm$ 5 (Anckiewicz et al., 1998).

The present age of 826 Ma from the inherited core and 456 Ma from the rim for the Chinglai gneiss supports the above interpretation. It constrained the age of the Gandaf and the Tanwal Formations regarded as Proterozoic and Cambrian respectively (Sak and Pogue, 1995). This also supports the argument that the Chinglai gneiss is not genetically related to the Ambela granitic complex (Khan et al., 1990; DiPietro et al., 1999).

DiPietro and Iscachsen (2001) regarded the 823 Ma age for the Black Mountain as minor Late Proterozoic intrusive event and possibly correlative with Malani magmatism which has been dated between 750 and 850 Ma on the Aravalli craton of northern India and with a ca. 870 Ma igneous suite from the Kirana Hills in Pakistan (Kazmi and Jan, 1997).

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