## New Insights into the Palaeoproterozoic Felsic Magmatism in Ne Rajasthan, India: Constraints from Zircon Dating, Geochemistry and Nd-sr Isotopic Systematics

P. KAUR<sup>1</sup>, N. CHAUDHRI<sup>1</sup>, I. RACZEK<sup>2</sup>, A. KRÖNER<sup>3</sup>, A.W. HOFMANN<sup>2</sup> and M. OKRUSCH<sup>4</sup>

<sup>1</sup> Centre of Advanced Study in Geology, Panjab University, Chandigarh, India <sup>2</sup> Max-Planck-Institut für Chemie, Mainz, Germany

<sup>3</sup>Institut für Geowissenschaften, Universität Mainz, Germany

<sup>4</sup> Lehrstuhl für Geodynamik und Geomaterialforschung, Geographisches Institut, Universität Würzburg, Germany

A large tract of Palaeoproterozoic crust is exposed in the northern and central parts of the Aravalli orogen<sup>1-4</sup>. Recent advances to understand the Precambrian crustal evolution of the Aravalli orogen is the identification of a ~1711-1660 Ma phase of albitised A-type granitic plutonism<sup>3-4</sup> and an older pulse of ~1850-1822 Ma Andeantype granitoid magmatism<sup>5</sup>. These results are, however, preliminary as the studies were restricted to a limited area in the northern part of the Khetri complex, situated about 150 km SW of Delhi. We present here new geochronological, geochemical and Nd-Sr isotopic data for granitoid intrusions of the southern and northern domains of the Khetri complex with an aim to delineate the existence of a widespread late Palaeoproterozoic magmatic event in the Aravalli orogen. The rocks are metaluminous to weakly peraluminous, largely ferroan and intraplate A-type granites. Most intrusives show evidence of moderate to extreme albitisation forming microcline-albite granite and albite granite, respectively. The mineralogical changes associated with progressive albitisation include transformation of oligoclase (~An<sub>12</sub>) and microcline (~Or<sub>95</sub>) to almost pure albite (~An<sub>0.5-2</sub>), ferropargasite to hastingsite and actinolite, and biotite to magenesio-hornblende/actinolite. The U-Pb zircon ages for four plutons cover a time span of 1732-1682 Ma, whereas Pb-Pb zircon evaporation data for three intrusives indicate minimum emplacement ages between 1671 and 1537 Ma. The Nd-Sr isotopic systematics suggest the involvement of Neoarchaean to Palaeoproterozoic crustal components in the petrogenesis of these granitoids. A regional survey of late Palaeoproterozoic ages in the Aravalli orogen provides considerable evidence for a geographically widespread ca. 1700 Ma extension-related event in the northwestern Indian shield. The record of comparable ages and the magmatic history reported in parts of North America and the North China craton may indicate the significance of this event for the break-up of the supercontinent Columbia.

Keywords: Aravalli orogen, late Palaeoproterozoic, A-type granites, zircon dating, Nd-Sr isotopic systematics

## References

- [1] M. Deb, R. I. Thorpe, and D. Krstic, Gond. Res. 5, 879 (2002).
- [2] I. S. Buick, C. Allen, M. Pandit, D. Rubatto, and J. Hermann, Precamb. Res. 151, 119 (2006).
- [3] P. Kaur, N. Chaudhri, M. Okrusch, and J. Koepke, *Mineral. Petrol.* 87, 81 (2006).
- [4] P. Kaur, N. Chaudhri, I. Raczek, A. Kröner and A. Hofmann, Geol. Mag. 144, 361 (2007).
- [5] P. Kaur, N. Chaudhri, I. Raczek, A. Kröner and A. Hofmann, Gond. Res. 16, 56 (2009).