

International Symposium on Precambrian Accretionary Orogens and Field Workshop in the Dharwar craton, Southern India

2-10 February 2011

Organized by



University of Delhi
Delhi

and



Geological Society of India
Bangalore

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About the symposium and field workshop

Precambrian accretionary orogens contributed large scale growth of continental crust owing to their high production rates of juvenile crust compared to Phanerozoic accretionary orogens. Recent studies have shown formation and fragmentation of several supercontinents during Precambrian. These regions are most intensely mineralized continental fragments which host much of the known gold, iron, manganese, nickel, chromium, PGE, copper, lead and zinc deposits. Further Precambrian accretionary orogens are key to our understanding of thermal and mechanical aspects of the development of protocontinents and geodynamic evolution of primitive Earth. All the exposed Precambrian orogens are dominated by three lithological associations: (i) tonalitic-trondhjemitic-granodioritic (TTG suites) associations, which represent first differentiated continental crust, (ii) volcanic-sedimentary associations (greenstone basins) which contain ultra-high temperature lavas, the best witness of Archaean mantle, and (iii) voluminous late potassic granites, which are often associated with high grade metamorphism and provide information on crustal reworking processes and stabilization of cratons.

During the last three decades big science projects in solid earth sciences such as various multidisciplinary geotranssects, together with numerous individual studies have focussed on dynamics and evolution of Precambrian accretionary orogens. These efforts generated most comprehensive knowledge base on the building of fundamental architecture of the continental lithosphere.

The Dharwar craton of southern India exposes a wide oblique transition through a segment of continental crust known for preservation of protracted geological record since 3.6 Ga and a major hot orogeny in the latest Archaean. This crustal section offers unique opportunity to study the origin and evolution of the Precambrian continental lithosphere at various crustal levels.

The craton is one of the best studied regions in Peninsular India. It is divided into two sub-blocks (western and eastern) based on crustal thickness, abundance of granite-greenstone, metamorphism and age of the basement. Therefore, each sub-block responded specifically to late Archaean orogeny.

The craton is comprised of vast areas of 3.4-2.56 Ga TTG regionally known as Peninsular gneisses, two generation greenstone sequences (>3.2 Ga Sargur Group and 2.9-2.6 Ga Dharwar Supergroup) and 3.0-2.5 Ga calc-alkaline to potassic granites. The polyphase TTG-type peninsular gneisses and plutons allow documenting evolving geodynamic processes of magmatic crustal accretion through secular cooling of the mantle. Several ultramafic units within the greenstone belts offer a wide

time window onto the Archaean mantle. The exceptional quality and continuity of the exposures from greenschist to granulite facies levels provide an opportunity to characterize three-dimensional orogenic processes on a crustal scale, i.e., the interplay of deformation and crustal flow, metamorphism and magmatism, especially during the latest Archean.

The Dharwar craton attracted scientific groups from different parts of the world. During the last three decades, tremendous achievements were made at further constraining the chronological, petrological and structural framework of the Dharwar craton. These have fundamentally renewed our view of the geology of the craton and have general implications for our understanding of Precambrian geodynamics. Yet, the relationship between the Dharwar craton the other Archaean provinces is still a major gap, and the craton is still too rarely referred to as a world-class example.

For the last two decades, no major international meeting has been organized on the Dharwar craton. It is high time to organize an international symposium and field workshop on the Dharwar craton to provide an opportunity to Indian and international scientists to discuss fundamental aspects of the development and stabilization of the lithosphere through the Precambrian, in the light of this outstanding example.

A two days international symposium (2nd and 3rd February) is proposed at University of Delhi (India) followed by one week (4th to 10th February 2010) field workshop in the Dharwar craton.

Themes of the symposium:

1. Origin of continents: Early Earth Evolution (4.0 to 2.5 Ga)
2. Precambrian greenstone belts: insights into mantle dynamics and lithosphere evolution
3. Archaean TTG and potassic granites: Insights into juvenile magmatism, continental growth and reworking
4. Precambrian sedimentary basins and evolution of early life
5. Structural patterns and tectonics of Precambrian accretionary orogens
6. Mafic dyke swarms, supercontinents and lithosphere evolution
7. Precambrian mineralisation

Tentative Field workshop programme

- 4-2-2011 – Bangalore to Hassan (visit to boundary shear zone, magmatic epidote bearing 3.0 Ga potassic pluton, spinifex textured/pillowed komatiites of Bansandra belt, chromite deposits of Nuggihalli schist belt, dyke swarms)
- 5-2-2011 – Hassan - Gorur - Holenarsipur (visit to oldest TTG, trondjemite plutons, komatiite/basalt/rhyolite sequences, Iattikere conglomerate, kyanite-garnet bearing, garnet-chloritoid bearing sediments, dome-basin structures, foliation triple points and older mafic dykes)
- 6-2-2011 – Hassan- Chikmagalur (visit to exposures of angular unconformity between basement and Bababudan sequence at Sigegudda, Karthikere road cut to see the paleosol and oligomict conglomerate, volcanic sequences of Bababudan basin and finally to the summit (1980m) to see thick BIFs)
- 7-2-2011 – Chikmagalur-Sira-Bangalore (crossing the older komatiite rich Sargur Group J.C. Pura greenstone belt and younger Chitradurga greenstone belt crossing the mylonitic boundary shear zone which is considered as terrain boundary and finally 2.56 Ga flat juvenile gneisses and 2.5 Ga pluton).
- 8-2-2011 – Bangalore - Closepet - Kabbaldurga - Bangalore (visit to Closepet granite, synplutonic mafic dykes and Kabbaldurga to see spatial relationship between juvenile magmatism, crustal reworking and charnockite formation. Relationship between flat and steep fabrics).
- 9-2-2011 – Bangalore - Harsely hills (visit 2.7-2.6 Ga juvenile gneisses, granites and spectacular mafic dyke swarms)
- 10-2-2011 – Harsely hills – Bangalore and departure

Deadlines

- First circular – 30th April 2010
Preliminary registration – 30th June 2010
Second circular with field workshop program – 30th August 2010
Submission of extended abstract – 30th November 2010
Registration – 31st December 2010
Final circular with program – 31st December 2010

Registration fee

Registration fee (only for 2 days symposium) – 300€
(Includes two days accommodation, working lunch and dinner)

Registration (symposium and field workshop) – 1000€
(Includes nine days accommodation, local field work transportation, lunch and dinner)

Abstracts

Abstract volume will be published by the Geological Society of India. Three pages (maximum including figures and line diagrams) extended abstract with 12 font size and references should be submitted as word file. We are planning to publish proceedings of the symposium as special issue in one of the international journals.

About Delhi

Delhi is historic city and capital of India which is well connected by air to the major cities of the world. The climate during beginning of February is bit cold with maximum temperatures around 15-20 degrees and minimum temperatures about 5-10 degrees. Warm clothing is required. There are number world famous touristic attractions in and around Delhi including Kutub Minar, Jantar Mantar, Red Fort, Fatehpur Sikri, Taj Mahal and Jaipur.

Weather conditions in the Dharwar craton

Weather conditions during the beginning of February are generally pleasant with maximum temperatures ranging between 28 to 31°C. No warm clothing is required.

All communications regarding the symposium and field workshop should be addressed to:

Prof. M. Jayananda

Convener

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Department of Geology
Centre of Advanced Studies
University of Delhi
Delhi – 110 007, India
Tel. +91-9560714425, Fax. +91-11-27666295
e-mail. dharwarsymposium@gmail.com
mjayan.geol@gmail.com
mjayanageo@rediffmail.com