

NOTES

SECOND MEETING CUM-FIELD WORKSHOP OF THE IGCP-470 IN THE SOUTHERN GRANULITE TERRAIN

The second meeting of the IGCP-470 (600 Ma Pan African Belt of Central Africa) was organized as a field workshop in the Southern Granulite Terrain (SGT) with the theme as Pan-African Manifestations in Tamil Nadu during 6th-8th August, 2005. 25 participants from Geological Survey of India (GSI), National Geophysical Research Institute (NGRI), Wadia Institute of Himalayan Geology (WIHG), University of Delhi, Mysore University and IIT Roorkee attended the workshop.

The participants assembled at Coimbatore where a technical briefing session was held on 5th August, 2005. The Chairman and the Convenor brought out the purpose of the field workshop as critical examination of selected Pan African manifestations in Tamil Nadu, ascertaining the gap areas in knowledge and producing tangible results in the form of publications within a stipulated period by the participants. A 36 page field guidebook specially prepared for the occasion was also released.

Day long field visits to carefully selected sites and intense discussion continued for three days. The first day field traverse (Coimbatore-Erode) on 6th August, 2005 began from Gudiyar quarry in the Moyar-Bhavani Shear zone area to observe the host rocks of the Pan African manifestations where Prof. C. Srikantappa (Mysore University) described the enderbitic granulites of the Nilgiri hills which show various stages of retrogression. Intense discussion followed on the characterization of a dyke like, dark coloured body of 'pseudotachylite'. This was followed by a visit to the Bhavanisagar quarry where a bleaching like effect of aqueous fluids was described as responsible for the retrogression of the enderbitic charnockites considered to have resulted as Bhavani gneisses in the area. The model Sm-Nd ages of the enderbitic charnockites are ~2.7 Ga while 'pseudotachylites' of the Gudiyar quarry have indicated argon-argon age of 1250 Ma. A later, possibly pan-African, reactivation is indicated by Rb-Sr whole rock and micas of the mylonites and Sm-Nd data of the shear associated garnets (740-500 Ma). The study of the older supracrustals was taken up in the area around Sathyamangalam (Erode district) where Dr. N.P. Nathan, GSI described the fuchsite quartzite (Periyakodiveri area and Indira Nagar), metaultramafite, metamorphosed banded iron formation (garnet-grunerite

association) and garnet-sillimanite rocks. The first day's traverse ended with the visit to the pan-African age Punjai-Puliyampatti (PP) granite. The outer margin of the body is of an encircling zone of radioactive pegmatite emplaced within the Bhavani gneiss (hornblende-biotite to biotite gneiss). The pegmatite is enriched in allanite and several other radioactive minerals. The medium grained grey granite was sampled for Rb/Sr geochronology and other studies.

The second day's traverse on 7th August 2005 was from Erode to Trichy and the Sankar-Tiruchengode granite was studied in detail. In a locality east of Kumarapalaiyam a pegmatite of pan-African age intrudes into Bhavani gneisses. Pink foliated granite was studied and sampled from several localities such as Reddipalaiyam, Tangaiyur etc. Both coarse as well as medium grained pan-African age granites (479-534 Ma) are present and are generally always foliated. The Tiruchengode granite is coarse, pink coloured and contains numerous allanite grains. Towards top of the hill, enclaves of Bhavani gneisses abound and are possibly on account of roof stoping. The second day's traverses concluded with Sitampundi layered anorthosite.

The third day's traverse (8th August 2005) centered south of the town of Trichy in Kadavur-Oddanchhatram-Virupakshi area. In the area around Kadavur massif, Dr. A.K. Sinha and Dr. N.P. Nathan, GSI described the well recorded fracture controlled charnockitisation of granite. Oddanchhatram anorthosite explained by R. Bhaskaran, GSI, on the northern margin of the Kodaikanal massif, is emplaced in charnockite-khondalite rocks. Garnet is conspicuously present in this pan-African (~560 Ma) body and participants suspected presence of ferrodiortite affinity rocks in the association.

Concluding session of the field workshop was held in Trichy on 8th August 2005 and was chaired by Shri U.K. Bassi, Dy. Director General, Geological Survey of India. Participants identified certain gap area for which sampling has been carried out and the results are expected within a period of less than a year. There was a general recognition of strong deformational features associated with the pan-African thermal activity. It was also expressed that some of the supracrustals which are correlated with older

events may be a part of the pan-African package. However, these issues will remain unresolved until more isotopic age data becomes available. It was felt that the combined laboratory facilities and resources of the assembled group (Electron microprobe, geochemistry, petrology and geochronology) would be able to address some of the

issues raised during this field workshop if coordinated properly.

Geological Survey of India

Faridabad

Email: pantnc@rediffmail.com

N.C. PANT

HIGH WAVE ACTIVITY OF THE TAMIL NADU COAST IS DUE TO AFTERSHOCKS INDUCED SEICHING EFFECTS

Recently the seashores of Chennai, Ennoor, Thiruvotriyar, Cuddalore and Kanyakumari were lashed by high waves during the period from the late night of the full moon day on 19th to 22nd August 2005. The usual height of low tide and high tide waves observed along the coast are always between 0.2 m and 0.7 m respectively. During the high wave activity waves rose to the height of 1.0 to 1.3 m along the Tamil Nadu coast, unlike tsunami which rose to heights between 1.5 to 3 m. After the December 2004 tsunamigenic Sumatra earthquake, the subsequent train of aftershocks resulted in the agitation of sea water so as to form oscillatory waves known as seiches. Such oscillations in sea water generated at Sumatra-Andaman region were reaching the coastal regions of Tamil Nadu after one or two days as seiches.

A seiche is a standing wave and can be considered as the sum of two progressive waves, travelling in opposite directions. Seiches can occur in lakes or bays due to storms, landslides and also earthquakes. During the seiching effect at either side (or) coast of the lake or bay, water level is alternatively high and low, whereas in the middle water level remains constant. Seiching effect may persist across the basin for hours (even more than 11 hours) with periods of oscillation between 10-17 minutes. Seiches are shallow water waves capable of inducing high wave activities along the coasts (Brown, 1991; Radhakrishnan, 1997; Beer, 1997; Abbott, 2002; Spencer, 2003).

On 19th August 2005 at the Marina Beach of Chennai, near Vivekanantha Illam, the sea inundated the beach up to 1 km and formed a pond. Similarly inundation of 150 m at Cuddalore, 200 m at Thiruvotriyar, sea water entered into 100 houses at Sivagaminagar of Thiruvotriyar, erosion of metal road at Ennoor and deposition of 10 cm of sand on the Thiruvotriyar beach road due to high wave activities were reported. At Cuddalore, Devanampattinam Silver Beach, the high wave activity started at morning 8 AM on Saturday 20-8-2005. Sea rose more than 1 m high and again

attained the normal state by 11 AM of that day and high wave activity persisted for 3 hours. Again on Monday morning 22nd August 2005, sea waves more than 1 m at Ennoor and Thiruvotriyar coastal areas with inundation of houses on coastal streets up to 200 m towards land. During the above period, the sea was rough at Kanyakumari coast, though there was no remarkable inundation, though erosional activity of the beaches was intense.

Following the aftershocks experience in Sumatra (Indonesia) and Andaman regions during 29th August to 2nd September (Table 1), another event of unusual high wave activity was observed at Chennai, Ennoor, Cuddalore and Kanyakumari coastal areas on 3rd (new moon day) and 4th September of 2005. At Marina beach, the sea receded 50 m while high wave activities were going on at Ennoor and waves rose to a height of more than a metre. It was also observed that after 18 hours of calmness, again the high wave activity started along the coast on early morning of 5th September 2005 and was active up to 8 AM of 6th September 2005. The inundation now was 40-60 m along



Fig.1. High wave activity on 29th June 2005 inundating a coastal settlement near Rayumanthurai village, Kanyakumari district of Tamil Nadu.