SHORT COMMUNICATIONS

CARBON ISOTOPE OSCILLATIONS THROUGH THE MARWAR SUPERGROUP, WESTERN RAJASTHAN

ANIL MAHESHWARI[1], A.N. SIAL[2] and S.C. MATHUR[3]
[1]Department of Geology, University of Rajasthan, Jaipur - 302 004
[2]NEG-LABISE, Department of Geology, C.P. 7852, Federal, University of Pernambuco, Recife, Brazil - 50,732-970Department of
[3]Geology, J.N.V. University, Jodhpur, India

Marine limestones and dolostones faithfully record the carbon isotopic composition of the ocean water in which they formed (Wang et al. 1996). About 10 carbon isotopic oscillations that range from -6.2 to 5.4‰ (PDB) have been documented through the Early Cambrian (Ripperdan, 1994; Brasier et al. 1994a, 1996). Saltzman et al. (1998) investigated the carbon isotope stratigraphy of the well-dated carbonates of the Phanerozoic geological record and confirmed that large perturbations in the carbon isotope ratios of common carbonates may be used as a precise measure of time.

We have conducted close-spaced sampling of the carbonate sequence of Marwar Supergroup, western Rajasthan from different locations for geochemical studies including carbon isotopic compositions. We report new carbon and oxygen isotopic data for 23 carbonate samples collected around Bilara town (Fig.1). The results indicate the presence of multiple, short term negative (up to -10.31‰ PDB) and positive (up to +2.80‰ PDB) carbon isotopic oscillations in the studied sequence. A cursory examination of the data indicate that these short term oscillations appear to match with those reported for early lower Cambrian (Nemakit-Daldynian) carbonates world-wide. Detailed geochemical studies of the Marwar carbonates from other locations are, however, in progress.

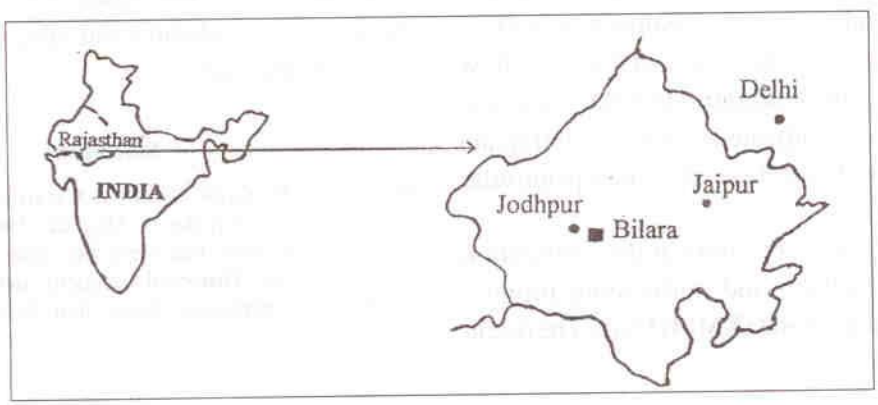

Fig.1. Location map of the study area.

References

BRASIER, M.D., CORFIELD, R.M., DERRY, L.A. et al. (1994a) Multiple δ13C excursions spanning the Cambrian explosion to the Botomian crisis in Siberia. Geology, v.22, pp.455-458.

BRASIER, M.D., SHIELDS, G., KULESHOV, V.N. and ZHEGALLO, Le. A. (1996) Carbon and oxygen isotope stratigraphy of the terminal Proterozoic to early Cambrian, west Mongolia, Geol. Mag., v.133, pp.445-485.

RIPPERDAN, R.L. (1994) Global variations in carbon isotope composition during Neoproterozoic and earliest Cambrian. Ann. Rev. Earth Planet. Sci. Lett., v.22, pp.385-417.

SALTZMANN, M.R., BRASIER, M.D., RIPPERDAN, R.L., LOHMANN, K.C. and RUNNEGAR, B. (1995) A large and global positive carbon isotope excursion during the late Cambrian: correlation with marine extinctions and sea level fluctuations. Geol. Soc. Amer., Abstracts with Programs, v.27, p.331.

WANG, K., GELDSETZER, H.H.J., GOODFELLOW, W.D. and KROUSE, H.R. (1996) Carbon and sulphur isotope anomalies across the Frasnian-Famennian extinction boundary, Alberta, Canada. Geology, v.24, pp.187-191.

JABALPUR EARTHQUAKE OF 17 OCTOBER 2000

V.K. KHANNA
Department of Geology, Govt. Autonomous Science College, Jabalpur - 482 001

Jabalpur is situated in the earthquake-prone Son-Narmada rift zone. A number of earthquakes have occurred in the past with epicentres in and around Jabalpur. These are 1846 (5.0 M), 1903 (5.0 M), 1973 (3.7 M), 1993 (3.8 M) and 1997 (6.0 M).

The 17 October 2000 earthquake was of 5.2 magnitude with epicentre at 23.1° N, 82.2° E and situated 33 km to the ESE of Jabalpur. This epicentre is located 11 km east of the epicentre of 1997 earthquake. The focus is 35 km deep (USGS data). There has been very little damage and no loss of life. However, cracks have developed in the buildings of Primo Pick N Pack Ltd in the epicentral area and also in poorly built houses in some other areas. It is yet another example of intraplate seismicity in the Stable Continental Region (SCR).

It is well known fact that the ENE-WSW trending Son-Narmada South Fault (SNSF), that is 35 to 40 km deep and activated at the crust-mantle boundary is the cause of earthquakes in the Jabalpur region. High strain rate (1.5-1.6) 10^{-8} ε per year and high heat flow (100-180 mWm^{-2}) in Saurashtra and Narmada-Son lineament zone also indicate increase in intraplate deformation in the lithosphere of Indian peninsular shield (Rao, 2000).

The 1997 earthquake occurred at the intersection of South Narmada Fault and north-south running Katni-Mandla-Malanjkhand (KMM) Fault. The recent earthquake occurred at the intersection of South Narmada Fault and north-south running Jhamil River Fault which is part of the KMM system. The occurrence of an earthquake of 5.2 magnitude, soon after an earthquake of 6.0 magnitude within three and half years is rather unusual and has created panic amongst the people. It may be continuation of events that started in 1997 but further work is needed to confirm it.

No aftershocks have been recorded in four weeks after the 17 October 2000 earthquake in the network of six microband seismographs temporarily set up by GSI and in the broad-band seismograph centre of Jabalpur. This may be due to lower magnitude and greater depth of focus. Even after 1997 earthquake (6.0 M), only 28 aftershocks of 1.5 or more magnitude were reported, of which just 5 were greater than 3.0 magnitude (Acharyya et al. 1998).

The Jabalpur area is sensitive from the point of view of recurrence of earthquakes. Seismological study of the area through global positioning system is therefore an urgent necessity.

References

ACHARYYA, S.K., KAYAL, J.R., ROY, A. and CHATURVEDI, R.K. (1998) Jabalpur earthquake of May 22, 1997: Constraint from aftershock study. Jour. Geol. Soc. India, v.51, pp.295-304.

RAO, B.R. (2000) Historical seismicity and deformation rates in the Indian peninsular shield. Jour. Seismology, v.4, pp.247-258.

CORRIGENDUM

Deep Crustal Structure of the West Bengal Basin Deduced from Gravity and DSS Data
by Manoj Mukhopadhyay (Jour. Geol. Soc. India, v.56, Oct. 2000, pp.351-364)

Owing to drafting error, the seismic velocity values (in km/sec) for the upper and lower crust at two shot points (*see* Fig.8 on p.360) are not correctly written. These are (i) corresponding to SP4 at depths greater than 10 km, the velocity values should read as 6.3; 6.45; 6.65 and 6.85 respectively, instead of 5.3; 5.45; 5.64 and 5.85. The velocity values are however correctly stated in the text, vide section (a), page 359; (ii) the velocity value under SP9 near Satgachia recorded at depths 15-20 km should read as 6.5 instead of 5.5. However, the correct velocity value is stated in the text vide section (b), page 361.