Supplementary online data: Protocol adopted for Gamma Ray Spectrometry

The elemental concentration of U, Th, and K were measured using gamma ray spectrometry, following Shukla et al (2002). In brief, dried and weighed powdered samples were cleaned and kept in sealed plastic boxes for 15 days for them to attain radioactive equilibrium between radioactive isotopes of uranium series. These were then counted using an ultra low background Canberra hyper pure germanium detector with an active volume of 148cc3. The elemental concentrations were measured using the characteristic gamma rays in comparison to our laboratory standard similar to basaltic matrix Reference source (New England Nuclear Standard #107) which has known concentrations of U (5.69 ppm), Th (14.5 ppm), and K (2.63%), in which the uranium series nuclides are established to be in secular equilibrium. The errors of measurement of these radionuclides (including systematic and statistical uncertainties) are <10 %.

All the samples are having low activity except the concentrations in samples from Gopnath area are relatively high and might be indicating incorporation of other material than carbonates, as the carbonates rocks are having low U, Th and K concentrations in general.