ICP-MS analyses were on the shungite whole-rock sample and not on the acid-resistant carbon residue The carbon residue contains only C_{60} and C_{70} and not any transition metal impurity

3 The definition of shungite needs to be addressed here Buseck et al (1997) have reviewed the various usages of the term shungite in literature (for details and references please refer Buseck, ibid) The term shungite has been used to describe all carbon bearing rocks of Lake Onega region, Karelia, Russia with the different types of shungite distinguished by their carbon content Some authors use it to describe the structural state of their carbon, so that the shungite has been applied to both the rocks and their elemental carbon A few others use it as adjective, as in Shungite-slate and Shungite-diabase, whereas others refer to Shungite rocks and then specify types A third procedure is to use both terms e g , "lydite (type-V Shungite)" Buseck et al (1997), however, have followed the prevailing usage and used the term shungite to designate reduced-carbon bearing rocks from Lake Onega region They further classified five different types of shungite based on carbon contents (Type –I = >75%-98%, Type-II = >35% to 75%, Type-III = >20% to 35%, Type IV >10 – 20% and Type – V = <10 %) Therefore Dr Kharkhanis's assertion regarding the shungite definition is not correct

4 The characterization of fullerenes by laser ionization mass spectroscopic method is a well-established procedure However, if the fullerene extract is more than few mg level then the powder-XRD, UV-Visible , Raman , Nuclear magnetic resonance (NMR) and FT-IR spectroscopic methods are used (Please see Parthasarathy et al 1998, 2003, 2008) The use of mass spectroscopy and gas chromatography-mass spectroscopy are the well-known methods for identifying the fullerenes

We are very grateful to the Editor, Journal of the Geological Society of India for his encouragements and support

References

Buseck, P R , Galdobina, L P, Kovalevski, V V, Rozkova, N N , Valley, J W and Zaidensberg, A Z (1997) Shungites The C-rich rocks of Karelia, Russia Can Min , v 34, pp 1363-1378

Buseck, P R , Semeon J , Tsipursky and Hettich, R (1992) Fullerenes from the geological environment Science, v 257, pp 215-217

Buseck, P R (2002) Geological Fullerenes review and analysis, Earth Planet Sci Lett , v 203, pp 781-792

Koslov, M E , Takumoto, M and Yakushi, K (1997) Spectroscopic Characterisation of pressure modified C_{60} Applied Physics, v 64, pp 241-245

Parthasarathy, G , Srinivasan, R , Vairamani, M , Ravikumar, K and Kunwar, A C (1998) Occurrence of natural fullerenes in low-grade metamorphosed Proterozoic shungite from Karelia, Russia Geochim Cosmochim Acta v 62, pp3541-3544

Parthasarathy, G and Vairamani, M (2003) Testing of fullerenes in geologic materials Oklo carbonaceous substances, Karelian shungites, Sudbury Black Tuff Geology v 31, pp e-31-e-32, doi10 1130/0091-7613(2003)31<e32tff1GM>2 0CO 2

Parthasarathy, G , Bhandari, N , Vairamani, M and Kunwar, A C (2008) High-Pressure phase of fullerene C_{60} in Iridium-rich Cretaceous-Tertiary boundary layers of Deccan intertrappean deposits, Anjar, Kutch, India Geochimica et Cosmochimica Acta, v 72, pp 978-987

Tenne, R , Margulis, L , Genut, M and Hodes, G (1992) Polyhedral and Cylindrical structures of WS2 Nature, v 360, p 444

NEW OCCURRENCE OF MANGANO-COLUMBITE FROM LATE PROTEROZOIC PEGMATITES OF BHURPIDUNGRI, JHARSUGUDA DISTRICT, ORISSA by P. Jagadeesan, K.S. Mishra and P.V. Ramesh Babu. Jour. Geol. Soc. India, v.66, 2005, pp.141-144.

S.Viswanathan, Hyderabad – 500 016, responds to author's reply·

The "six observations" made by the authors in their reply clearly reveal that they have not comprehended the importance and significance of my comments Some of their statements are also misleading

Observations 1 I wonder how the authors got the impression that I was trying to get credit for the late B N Tikoo for being the first to recognize manganocolumbite in India in the Bihar Mica Belt All that I had mentioned was that, Tikoo had found columbite-tantalite with high MnO contents in several localities of the Bihar mica-pegmatite belt, but that, they cannot be regarded as being manganocolumbite because their Ta_2O_5 contents are more than 20%

Observation 2 The sweeping statement of the authors that "the Ta_2O_5 content have nothing to do with the nomenclature of manganocolumbite, instead, if it is high >50%, it will be known as manganotantalite" The consensus is that, a member of the columbite-tantalite isomorphous series can be named as a 'columbite' only if its Ta_2O_5 content is less than 20% (preferably, less than 15%), and if it is to be named as 'manganocolumbite', its MnO/FeO ratio should be more than 3 If its Ta_2O_5 content is 20 40% and the Ta_2O_5/Nb_2O_5 ratio is less than 1, it is to be named 'tantalocolumbite' If its Nb_2O_5 content is 20-40% and the Ta_2O_5/Nb_2O_5 ratio is more than 1, it is to be named as a 'columbotantalite' If it has an Nb_2O_5 content of less than 20%, it is to be named as a 'tantalite' The prefixes 'mangano' and 'ferro' can be added to these four root names (columbite, tantalocolumbite, columbotantatlite, and tantalite) if the MnO/FeO ratios are more than 3 and less than 3 respectively Therefore, contrary to the understanding of the authors, the Ta_2O_5 content of a columbite-tantalite has everything to do with its nomenclature

The authors have stated that "Presently naming of the mineral has been preferred by taking elemental ratio of Mn/Mn + Fe (atomic ratio) (after Cerny et al 2003) instead of taking MnO/FeO ratios" However, they have not given the value of Mn/Mn + Fe that a columbite tantalite should have to be named as manganocolumbite It is immaterial whether we use the MnO/FeO ratio or the Mn/Mn + Fe ratio for naming a columbite-tantalite as 'manganocolumbite' for the following reason The atomic number of Mn is 25 and that of Fe is 26 As Mn is divalent, and Fe in columbite-tantalite is also divalent, the molecular weights of MnO and FeO are almost identical, being 70 9 and 71 8 respectively Chemical analyses of columbite-tantalies report only MnO and FeO, and therefore, computing the MnO/FeO is simple and straightforward, whereas, the calculation of the elemental ratio of Mn/Mn + Fe (atomic ratio) involves unnecessary work

Obseravtion 3 The opening statement "His comment on percentage of Ta_2O_5 that it should be <20% is not correct" is unfortunate The second statement that "the manganocolumbite mineral data clearly shows it can be >20% and can go up to 33 55% (Cerny et al 2003, Breaks et al 1999)" conflicts with the criteria established by several authorities for naming a columbite-tantalite as 'manganocolumbite' If some persons have erroneously named columbite-tantalites with more than 20% Ta_2O_5 going up to 33 58% as 'manganocolumbite', it does not become a basis or reference point to be very loose or casual in the nomenclature of columbite-tantalite It is also incorrect to quote a value such as "33 58%" when every analytical result has an error associated with it

Observation 4 In view of what I have stated under Observation 3, we should not blindly follow whatever is published by westerners, without any critical evaluation It is not clear what the authors mean by their statement "comparison is not only done for the percentage of MnO_2 but considering all the major oxides and its geological set up"

Observation 5 As the authors have provided the information I had sought in my comments, this needs no response

Observation 6 The statement that "in a pegmatite there will not be a single mineralogical representation but they occur in a isomorphous solid solution series" is indeed vague

I have a suggestion for the authors Their samples BP/1, BP/2, and BP/6 have MnO/FeO ratios of 2 75, 2 77 and 2 43 and Ta_2O_5 contents of 13 58, 16 18, and 13 84% respectively These samples should be reanalyzed for their MnO and FeO contents The sample BP/3 has an MnO/FeO ratio of 3 and Ta_2O_5 of 24 45% It should be reanalyzed for Ta_2O_5 If the new results indicate MnO/FeO ratios of more than 3 for the samples BP/1, BP/2, and BP/6 and less than 20% Ta_2O_5 for the sample BP/3 the four samples could indeed be manganocolumbite

P. Jagadeesan, K.S. Mishra and **P.V. Ramesh Babu** reply

The authors are thankful to S Viswanathan for his further observations on our paper The reply to his observations are given below

The authors did not mean in that sense what S Viswanathan observed (observation 1) from our reply We had replied in the context that it is the first time that manganocolumbite was reported from India We deeply apologize to S Viswanathan if our reply has hurt him in anyway

The following are the reply to his observations 2 and 3

Nomenclatuer of columbite-tantalite Minerals of columbite-tantalite group have the general formula of

AB_2O_6, in which the A position is occupied mostly by Fe^{2+} and Mn^{2+} and trivalent cations; the B position is occupied mainly by Nb^{5+} and Ta^{5+} and, subordinately by Ti^{4+} and Sn^{4+}. These orthorhombic minerals include the end members ferrocolumbite ($FeNb_2O_5$), manganocolumbite ($MnNb_2O_6$), manganotantalite ($MnTa_2O_6$) (Cerny, 1989). Although ferrotantalite [(Fe>Mn) $(Ta>Nb)_2O_6$] is a member of the columbite-tantalite group in the classification of niobium-tantalum oxides, the end member $FeTa_2O_6$ is tetragonal and belongs to the tapiolite series.

To describe the compositional variation of columbite-tantalite within and between bodies of pegmatite, the names are restricted to the compositions (Thomas Muljha, 1998) viz.

Ferrocolumbite – Ta/(Ta+Nb) < 0.5 and Mn/(Mn+Fe) < 0.5;
Manganocolumbite – Ta/(Ta+Nb) < 0.5 and Mn/(Mn+Fe) > 0.5;
Manganotantalite – Ta/(Ta+Nb) and Mn/(Mn+Fe) > 0.5.

Nowadays to know the compositional ranges of columbite-tantalite, the data are plotted in the $FeNb_2O_6$ – $MnNb_2O_6$ – $FeTa_2O_6$ – $MnTa_2O_6$ quadrilateral plot. The manganocolumbite data of Bhurpidungri are plotted in the quadrilateral plot and they are falling in the manganocolumbite field (Fig.1) except sample No.BP/5 which could be ferrocolumbite.

In reply to his observation no.4, the authors have referred papers published in international journals by Peter Cerny who is considered to be the authority on pegmatites and has been doing research in pegmatites for the past 30 years.

The authors did not think in that way as observed by him in observation 5.

The composition of columbite-tantalite may vary within a single pegmatite or between bodies of pegmatites. The compositional variation of columbite-tantalite indicates the evolution of pegmatites. The columbite-tantalite display a progressively increasing trends of Mn/(Mn+Fe) and Ta/(Ta+Nb) values from primitive beryl bearing pegmatites through complex zoned pegmatites (LCT type). However, as suggested by him the samples will be reanalyzed.

ESTIMATES OF EFFECTIVE ELASTIC THICKNESS ALONG THE SOUTHWEST CONTINENTAL MARGIN OF INDIA USING COHERENCE ANALYSIS OF GRAVITY AND BATHYMETRY DATA - GEODYNAMIC IMLICATION by Sheena V. Dev, M. Radhakrishna and C. Subrahmanyam. Jour. Geol. Soc. India, 2007, v.70(3), pp.475-487.

S.K. Biswas, 201/C, ISM House, Thakur Village, Kandivali (East), Mumbai – 400 101. *Email:* sanjibkbiswas2001@yahoo.co.in, comments:

I congratulate the authors for a significant paper proposing an alternative model for the Comorin Ridge based on effective elastic thickness data. However, I am constrained to draw their attention to the morphotectonic map presented in Fig.1 since they referred me (Biswas, 1982, 1987) for structural details shown in the map. In the map the ridges and depressions are not correctly shown. This needs to be corrected, as this could be very good reference map for the researchers investigating on the tectonic and geodynamic problems of WCMI.

Kori-Comorin Depression and Kori-Comorin Ridge are shallow water shelf edge structural features (Biswas and Singh, 1988). But in the map these are labeled in the deep water beyond the continental slope. Western offshore shelf from Kutch to Comorin is defined by a conspicuous structural high, a fault bounded basement ridge originally mapped as the shelf Margin High or Ridge. Shoreward the ridge is coupled with a complimentary structural low originally mapped as Shelf Margin Depression. Farther east towards the shore Shelfal Horst-Graben Complex occur. The Western Continental Shelf structure is styled by these three elements. The ridge connects the Kori High in Kutch offshore in the north and the Pratap ridge in Kerala offshore bordering the present continental shelf. We formally named this Ridge collectively as Kori-Comorin Ridge (KCR) as it extends from Kori High in the north to almost Comorin depression in the south. The ridge follows the 200 m bathymetric contour in most part of its length upto the Vengurla Arch. South of the arch in offshore Konkan-Kerala, it crosses the shelf-slope boundary and joins the Pratap Ridge along the slope in deep water (Biswas and Singh, 1988; Singh and Lal, 1993). The Shelf Margin Basin is the corresponding structural low and is formally named as Kori-Comorin Dpression (KCD). Seaward Laxmi Depression (LD) follows these ridge-depression pair between the continental slope and Laxmi Ridge (LR) in the northern part. In Fig. 1 Sheena et al. (2007) have correctly shown the positions of the latter structures but KCR/KCD should be shown along the shelf