Further comments on 'Fertile plants regenerated from mesophyll protoplasts of cold-tolerant rice' (J. N. Gupta, *Curr. Sci.*, 1995, 68, 755–758)

An unfortunate controversy has arisen regarding the above paper published in Current Science in September 1995. This was subsequently the subject of discussion in these columns in February 1996. The matter is closed with the publication of the following correspondence.

– Editors

This is a rebuttal of false allegations levelled by J. N. Gupta in his reply published in your esteemed journal (1996, **70**, 264–265). J. N. Gupta asserted in his reply that the work in question (published by J. N. Gupta and S. N. Gupta of Gorakhpur University in *Current Science*, 1995, **68**, 755–758) was done by him at ICAR Research Complex, Barapani (in my laboratory), it is a part of his Ph D thesis and that I misused my position to publish the same.

The allegations are false and without any element of truth. In fact, J. N. Gupta's claim is self-contradictory. On one hand, he says that his protocol published in *Current Science* in 1995 is entirely different from mine which was published in 1993 and on the other hand, he alleges that I misused my position and published his protocol. In order to resolve the controversy, I have now obtained a photocopy of his Ph D thesis and there is no mention of this work in his thesis. This shows that he had not done this work till the submission of his thesis and consequently; his claim to have done this work in my laboratory is wrong.

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I have the following comments regarding the paper in *Current Science*.

1. The published work in *Current Science* (1995, **68**, 755–758) is not a part of Mr J. N. Gupta's Ph D thesis.
2. I never consented to be a co-author in any of his research papers.

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J. N. Gupta maintains:

1. The work reported in *Current Science* (1985, **68**, 755–758) on mesophyll protoplast to plant system in rice has been carried out by me. I never claimed that the reported genotype is a part of Ph D thesis.
2. I published this work from Gorakhpur University, Ludhiana and Gorakhpur; Punjab Agricultural University, Ludhiana and Directorate of Rice Research, Hyderabad respectively.

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Comments on 'Interstratified low-Ti and high-Ti volcanics in arc-related Khairagarh Group of central India'

(Asthana *et al.*, *Curr. Sci.*, 1996, **71**, 304–306)

1. In Figure 2, Asthana *et al.* have indicated CaO/TiO_2 ratio for low-Ti basalt and high-Ti basalt, which is not consistent with the REE patterns for both the basalt. In low-Ti basalt CaO content is more than that of high-Ti basalt but the shown negative Eu anomaly for the low-Ti basalt is contradictory in respect to CaO content.

2. Derivation of arc-related magma is possible by thermal plumes mechanism involving a thin crust underplating and also by crust mantle recycling.

3. The authors have shown that two basalts have different REE patterns and have explained that which cannot be due to fractional crystallization/crustal contamination, however, the observed REE patterns can be derived from the crustal contamination and/or by combination of fractional crystallization and assimilation (FCA). From the given REE pattern it is hard to assess the heterogeneity of mantle source. Although the observed LREE patterns can be better explained by different degrees of partial melting of a rather homogeneous mantle source. The authors have put a question mark for LILE which is very important to decide low/high degree of partial melting as well as fractional crystallization. Hence, the degree of partial melting appears ambiguous. If the source is LILE enriched then mantle may reflect crustal recycling.

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D. Asthana et al. reply:

1. CaO/TiO_2 vs TiO_2 and Al_2O_3/TiO_2 vs TiO_2 plots (Figure 2) clearly indicate a

fertile source for the high-Ti basalt (CaO/TiO_2 : 10–4; Al_2O_3/TiO_2 : 18–8)[1]. Assuming a similar source, our dataset[2] indicates that the low-Ti basalt (CaO/TiO_2 : 18–8; Al_2O_3/TiO_2 : 26–18) has formed by relatively higher degrees of partial melting than the high-Ti basalt. However, other datasets[3–5] clearly indicate that the source of the low-Ti basalt was relatively depleted (Cao/TiO_2 : 35–10; Al_2O_3/TiO_2 : 45–15). The low-Ti basalt was probably formed by remelting of a source which had undergone a previous episode of magma extraction[1]. Therefore, Figure 2 of our paper clearly indicates heterogeneity in the mantle source of the basalts which is also evident from their REE patterns (Figure 3). The two cross-cutting REE patterns cannot be obtained by different degrees of partial melting of a homogeneous source[6]. The HREE and Ti depletion in the low-Ti basalt can be due to the following reasons:

i) The low-Ti basalt was formed by relatively higher degrees of partial melting. ii) Mantle wedge of the low-Ti basalt has undergone previous episodes of magma extraction. iii) Mantle residue of the low-Ti basalt has higher proportions of garnet[7] and/or rutile[8].

The LREE enrichment in the low-Ti basalt clearly indicates higher subduction fluxes which is also evident from higher LILE contents in this basalt[9–11]. Pandey has stated that CaO content in the low-Ti basalt is more than high-Ti basalt, but from Table 1 it is evident that CaO content in the low-Ti basalt (7.08 wt%) is less than that in high-Ti basalt (8.50 wt%). Lower concentration of CaO in the low-Ti basalt probably indicates plagioclase fractionation which is also evident from negative Eu-anomaly shown by this basalt.

2. Derivation of arc-related magmas is not possible by thermal plumes or crustal underplating. Arc-related magmas are generated by decompression melting in the mantle wedge, augmented by aqueous fluids derived from the subducting oceanic crust[7,9,12–14].

3. Both the basaltic suites have high MgO-content (12–7 wt%) which rules out the possibility of their crustal contamination[15–17]. MgO > 6 wt% is generally considered as an adequate filter for AFC processes[15]. Therefore, we have not correlated the two suites by AFC. We have put a question mark for LILE because these are potentially mobile elements in altered volcanics such as Khairagarh basalts[18]. Therefore, LILE contents assume no importance in deciphering degrees of partial melting in these basalts. On the other hand, in altered and low grade volcanics, relatively immobile elements such as HFSE and REE assume vital importance in understanding degrees of partial melting and fractional crystallization[18]. LILE enrichment in the primitive arc-related magmas clearly indicates enrichment of the mantle wedge by subducting oceanic crust-derived fluids. Therefore, convergent margins are the zones of crust–mantle recycling.

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Predicting monsoon rainfall and pressure indices from sea surface temperature

Several prediction techniques have been developed[1] to forecast the all India summer monsoon rainfall during the period, June–September. Among them, DWPJ-A, BMBPA-J and A-MR500 are found to be the most useful predictors. Nicholls[2] reported that the SST in the north Australia–Indonesian region (5–15°S, 120–160°E) is useful to predict monsoon rainfall.

Several studies[3–6] reported the relationship between SST in Indian ocean and monsoon rainfall over the Indian subcontinent. But, there is a divergent opinion on this aspect which is partly attributed to the poor quality of SST data in the Indian ocean[7]. Using the latest and high quality data set[8] on SST anomalies (MOHSST.6), an attempt is made here to re-examine the role of Indian Ocean SST in monsoon rainfall.