

LETTER TO THE EDITOR

Comment on “Toba Ash on the Indian Subcontinent and Its Implication for the Correlation of Late Pleistocene Alluvium”

The paper by S. K. Acharyya and P. K. Basu (1993) on Toba ash is a good account of the various discoveries of ash in the Indian subcontinent and its distribution, chemical composition, age estimation, and source. It can help in more precise dating of the fossil/artifact-bearing sediments of the Quaternary Period. However, we wish to offer several comments about this paper.

The ash bed from the Baghor Formation (coarse member) is reportedly reworked and hence its date may be ambiguous. Also, the correlation of this formation with the Jhalon Formation in the Central Narmada Valley cannot be accepted *in toto*. In fact, the Baghor Formation (coarse member) should be correlated with the Devakachar Formation (at least in part) on the basis of dates, faunal, and cultural material (G. L. Badam and V. Sathe, unpublished data).

Around Devakachar, a lens of ash has been found within alluvium of late Quaternary age (Jhalon Formation) and appears to be redeposited. Hence, this material will not be reliable for dating the alluvium. The situation here is the same as in the Son Valley. In view of this, we should have more dates from thick and extensive ash beds to permit reliable correlation. The date of the Pawlaghat ash, which is about 25 to 40 cm thick and primarily within the basal channel sand facies, may be more reliable. Here, the ash lens is again associated with a channel facies containing Middle Palaeolithic artifacts in a secondary context.

The authors have not given any proper explanation for the occurrence of lenses of volcanic ash only in certain localized situations in the Narmada Valley.

Assigning an age of 200,000–300,000 yr to the Devakachar unit cannot be accepted in the absence of any reliable absolute dates. Our experience shows that the palaeontological and archaeological material associated with the Devakachar Formation is not in primary context and that the latter is not associated at all.

Reworked ash beds and unproved primary context of lithic and faunal material in the alluvial deposits of the Narmada Valley lead to a complex situation. Hence, assigning an age of 75,000 yr to the volcanic ash appears premature at this stage of research.

The presence of fossil *Equus onagar khur* in the Son Valley is rather doubtful and this species has not been

reported from the Narmada Valley. The home range of this species is in the hilly terrain of Ladhak and Tibet, whereas *Equus hemionus* is restricted to the Rann of Kutch. Unless the upper and lower teeth are considered, it is very difficult to separate *E. hemionus* from *E. asinus*. On the other hand, the Baghor Formation (coarse member) has yielded a few phalanges, metapodials, astragali, an acetabulum, and a few teeth that can be definitely assigned to *E. asinus* and dated as late Pleistocene. We also have evidence of *E. asinus* from Kurnool Caves in Andhra Pradesh (Badam, 1984), which is dated by TL to 25,000 yr B.P.

Elephas namadicus is characterized by narrow (rather than broad) molars. Plates are straight and the loxodont sinus is absent. In fact, it is similar to the *Elephas antiquus* of Europe.

The correct nomenclature for *Hippopotamus palaeindicus* is *Hexaprotodon palaeindicus*. The latter species is characterized by the presence of six incisors, whereas the genus *Hippopotamus* has only four and it includes only the surviving African species *Hippopotamus amphibius*.

As regards the Indian wild dog, *Cuon alpinus*, its presence in fossil form has not yet been confirmed by students of canine phylogeny. Moreover, according to the authors, only one specimen of this species has been found in the Devakachar Formation. Hence, it is premature to assume that it is present in late Pleistocene deposits of the Narmada Valley. In fact, the identification of this specimen is open to revision.

The placement of the only specimen of *Homo erectus* found in the Narmada Valley has generated considerable debate. However, on the basis of some physical features, associated cultural material, geological considerations, and comparative study, it had been suggested that this specimen is an archaic *Homo sapiens* type. The authors concur with these physical considerations, but without referring to earlier studies (Badam, 1987, 1989; Badam *et al.*, 1986; Salahuddin *et al.*, 1986–1987; Kennedy and Chiment, 1990).

The degree of oxidation depends on various local factors and may not imply similarity of age. The fauna in both the Central Narmada and Son Valleys are generally long-ranging and do not help in chronological assessment

except for *Sus namadicus* and *Hexaprotodon namadicus*, which are regarded as indices for the Middle Pleistocene (Badam, 1984). The rest may be considered of late Pleistocene or terminal Pleistocene to Holocene age. We have a lot of evidence for this from the Son Valley (e.g., *Axis axis*, *Axis porcinus*, *Antilope cervicapra*, *Muntiacus muntjak*, *Gazella gazella*, *Cervus unicolor*, *Cervus duvauceli*, *Boselephas tragocamelus*; Badam *et al.*, 1989) and from the Narmada Valley (e.g., *Axis axis*, *Antilope cervicapra*, *Cervus* spp).

In light of the above comments, we suggest that the ash bed in the Quaternary alluvial deposits cannot be used as a reliable marker horizon at this stage of our knowledge of the bio- and lithostratigraphy of the region.

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