SHORT COMMUNICATIONS

OBSERVATIONS ON CRETACEOUS/ TERTIARY BOUNDARY AND REPORTED IRIDIUM ENRICHMENT, KHASI HILLS, MEGHALAYA

T. C. LAHIRI, M. K. SEN,
A. K. RAYCHAUDHURI and
S. K. ACHARYYA
Palaeontology and Stratigraphy Division,
Geological Survey of India, Calcutta 700 016, India.

IRIDIUM enrichment accompanied by high concentration of other siderophile elements has been reported at the K/T contact in Umsohrynkew (Therria) river section, Meghalaya[1]. The contact is also reported to show an abrupt break in planktonic foraminifera[1,2] and is thus believed to confirm similar observations made from other parts of the world[3,4]. The purpose of this communication is to record results of our biostratigraphic study from the same section, also based on planktonic foraminifera which is at variance. A restrained approach is advocated before attempting such generalizations.

No such widespread break in planktonic foraminiferal fauna at the level reported by Pandey[2] was noted by us. Cretaceous fauna continue well above that level and a late Maestrichtian assemblage of *Globotruncana gansseri, G. gagnebini, G.* cf. *havanensis*, etc. is seen about 35 m above the recorded iridium rich limonitic layer. The fauna is represented by fresh, unreworked forms (figure 1). All along this 35 m segment, various Cretaceous planktonic foraminifers, although variable in frequency, are present. This is followed by an assemblage of *Globigerina fringa, G. triloculinoides, Globorotalia pseudobulloides, G.* cf. *compressa, G.* cf. *inconstans* of Early Paleocene age. Our study establishes uninterrupted sedimentation of calcareous shale and marl across the K/T boundary and these have been grouped by us within the Langpar Formation.

Figure 1. *Globotruncana gagnebini* Tilve. Umbilical side (×200).

Bhandari and others noticed the occurrence of iridium enrichment at their K/T contact from this section. Our biostratigraphic results and basis of delineation of K/T contact were communicated to Bhandari and Pandey.

Because of the differences in our results and importance of the issue deserving a closer attention, a joint field traverse was organized during February, 1987 and Dr Pandey showed us (MKS and SKA) their K/T contact and the 1.5 cm thick limonitic band having the iridium enrichment. The section was resampled and the planktonic foraminiferal study corroborated our earlier observations. It is also of interest to note the presence of a vitrinite coaly matter of about 1 cm diameter, just above the limonitic band. Some cross fractures with limonitic matter also occur in this zone. The section has also been sampled by workers from the Birbal Sahni Institute of Palaeobotany who accompanied the joint traverse.

Other issues about this classic section also deserve additional remarks. Pandey[2] had delineated K/T contact based on abrupt disappearance of *Globotruncana – Heterohelix* suite and appearance of *Turborotalia sabina* assemblage. Bhandari *et al*[1] citing this reference, however, state that "typical assemblages in the Cretaceous include *Globotruncana – Globigerina eugubina*". *G. eugubina* is known to be the characteristic species marking the earliest Paleocene time[5].

Bhandari *et al*[1] and Pandey[2] place their K/T contact 10 m below their "Mahadeo"/Langpar formational contact. This is also the level (K/T contact) where they report anomalous concentration of iridium in a limonitic clay layer[1]. However, locating this limonitic clay layer in the map and section given by Pandey[2], there appears to exist a minor but significant discrepancy of about 4 m intervening between the iridium enriched limonitic clay layer and their foraminifera based K/T contact further up on the vertical column.

We also differ in the placement of Mahadek-Langpar formational contact. The last exposure of

the scarp forming coarse glauconitic sandstone, on the right bank is assumed by us to represent the top of the Mahadek Sandstone. Following this, the exposure gap further down stream and the succession of calcareous shale and marl with thin sandy intercalations was grouped by us within the Langpar based on the best possible and objective lithologic criteria. Incidentally, the gap zone is now exposed in a newly cut road section. From the map of the river section and computed profile given by Pandey[2] (figure 1 of his paper) it is observed that these calcargillaceous sediments up to about 50 m thickness have been included within their "Mahadeo" Formation. Our K/T contact falling within the Langpar Formation is about 30 m (60 m map distance) above their K/T contact and is located at about 69 m (138 m map distance) above the last exposure of the Mahadek Sandstone on the right bank of the river.

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INCIDENCE OF TOXIGENIC *ASPERGILLUS FLAVUS* IN MARKETED EDIBLE VEGETABLE OILS

SEEMA SARNAIK, S. H. GODBOLE and PRADNYA KANEKAR

Maharashtra Association for the Cultivation of Science Research Institute, Law College Road, Pune 411 004, India

THE pods of groundnut mature beneath the surface of the soil and at maturity the whole plant is harvested. Groundnut pods are many a time infested by soil fungi especially belonging to *Aspergillus flavus*[1,2]. Ability of the isolates of *A. flavus* to produce aflatoxins in groundnut and in a nutrient medium has been reported[1]. The presence of aflatoxin in unrefined oil has also been reported[3-5]. No information is, however, available on the presence of *A. flavus* in groundnut oil. This paper reports the incidence of *A. flavus* in marketed vegetable oils and the inability of the toxigenic strains to produce aflatoxin in groundnut oil.

Twenty-six oil samples comprising of 12 unrefined, seven refined groundnut oil and seven oil samples from ration shop were collected in sterile containers from the local market and processed immediately for microbiological analysis.

Isolation of A. flavus

A. flavus was isolated using *Aspergillus* differential medium[6]. An aliquot of 0.1 ml of suitable dilution of 1% emulsion of oil in quarterstrength Ringer's solution containing 0.1% agar[7] was mixed with the medium and pour plate method was used. The plates were incubated at room temperature for 96 h and the isolates were identified by studying morphological characteristics according to Barnett[8].

Ability of the A. flavus isolates to produce aflatoxin

Ability of the isolates of *A. flavus* to produce aflatoxin in nutrient medium was studied according to the method of Borker *et al*[9]. The isolates were also inoculated in 4 sets of one kg sterile groundnut oil and incubated at room temperature for three months. A pair of inoculated and uninoculated flasks were examined for the evidence of aflatoxin production by the method of Pons *et al*[10], immediately after inoculation and also at monthly intervals during incubation.

The data on incidence of *A. flavus* and the toxigenic *A. flavus* in the oil samples are given in table 1 which shows that of the 26 samples exa-

Table 1 *Incidence of Aspergillus flavus and toxigenic A flavus in different oil samples*

Oil samples examined		Oil samples showing presence of	
Type	Number	*A flavus*	Toxigenic *A flavus*
Unrefined groundnut	12	3 (25.00)	2 (16.67)
Refined groundnut	7	0	0
Ration	7	3 (42.85)	3 (42.85)
Total	26	6 (23.08)	5 (19.23)

Figures in parantheses indicate the percentage.