able to narrow, if not close, the 3 billion year gap between life-beginnings and their diversification. At the same time, in the light of present revision of some of the Doushantuo fossils as embryos, earlier dismissed as green algae[26], it may be worthwhile to reexamine many of the previous findings rejected as non-biogenic.

The widely discussed Central Indian discovery by Seilacher *et al.* has raised two important issues – firstly, the age of the Chorhat sandstone wherein the burrows were found and secondly whether these are indeed biogenic and if so whether they are the work of triploblastic metazoans or simple unicellular forms. The answers to these questions are necessary to push back the dawn of multicellular life some 500 million years predating Cambrian and for a proper assessment of the existing views about Vindhyan correlation.

Finally, fixing age of a sedimentary horizon based on biostratigraphy and biochronology has pitfalls if the possibilities of fossils (or clasts containing fossils) that may be reworked from older to younger sediments are not properly recognized, in the same way as the likelihood of older grains that might have mixed up during Chorhat sedimentation giving these rocks a much older age, as some skeptics have pointed out. In this connection, the age of the kimberlite igneous intrusion (1067 ± 31 m.y.) into the lower Vindhyans are more reliable pointers that the Semri Group rocks may be indeed >1000 m.y. old, though the presence of this intrusive in the overlying younger Kaimur beds (dated to be around ~890–~725 m.y.[24,27]) poses a geological anomaly, which presently is viewed as a unique selective erosional consequence[21]. Unless supported by unambiguous geochronologic data, attempts to correlate sedimentary beds on basis of similarity of fossils or rock sequences may be hazardous. Future dating attempts may have to be carried out on samples undoubtedly contemporaneous with the sedimentation and by methods, which are not debatable.


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## SCIENTIFIC CORRESPONDENCE

# Can free fatty acids in the tiger pheromone act as an individual finger print?

Theoretically, the scent marking of animals must encode information on individuality. The animals can and do distinguish such individuality but the molecular basis thereof is ill-understood. Only in the study by Gorman[1] on mongoose, was a clear cut molecular basis detected in their pheromonal secretion, namely, unique ratios of carboxylic acids characterizing each individual mongoose.

The data presented here suggest a possible molecular basis in the proportions of free fatty acids (FFA) in the marking fluid (MF), the most important source of pheromones in tigers[2,3] which is a lipid-rich, smelly fluid ejected upwards and backwards through the urinary channel.

Eleven FFA in tiger MF, from acetic to octanoic acid, have been quantitatively estimated[4] with the help of an internal standard (crotonic acid) under isothermal conditions. The values for acetic and octanoic acid are shown in Table 1. GCMS on a 60 m long DB WAX capillary column (temperature 50°–200°C programmed at 50°C/min)

**Table 1.** Quantitative estimation (μg/ml) of acetic acid and octanoic acid in MF of three tigers. Six replications of tigers 1 and 3 and four replications of tiger 2 were made

| | Acetic acid | Octanoic acid |
|---|---|---|
| Tiger 1 | 3.9 | 16.5 |
| | 2.4 | 50.4 |
| | 5.0 | 10.4 |
| | 0.8 | 34.3 |
| | 6.2 | 25.4 |
| | 0.2 | 22.7 |
| Tiger 2 | 26.2 | 11.7 |
| | 16.4 | 12.5 |
| | 14.0 | 6.1 |
| | 15.0 | 1.4 |
| Tiger 3 | 9.9 | 15.9 |
| | 4.7 | 19.3 |
| | 3.1 | 51.4 |
| | 8.3 | 46.2 |
| | 9.0 | 14.0 |
| | 5.6 | 21.2 |

further confirmed the identity of these FFA.

Six, four and six replications of the quantitative values (μg/ml) of FFA in the MF of tigers 1, 2 and 3, collected over a long period of time, show a wide range of variation.

This situation is very different from that of the mongoose[1]. The values for Euclidean distance and Mahalanobis distance between any pair of the three sets of values for the tigers have been calculated by taking average values, but in view of the wide range of variation we have chosen another method of representing the genetic distance of the three tigers. Figure 1 shows a method of visually representing this. Each polygon encloses the quantitative values of FFA in the three tigers (6, 4 and 6 for tigers 1, 2, and 3 respectively). For acetic acid the two polygons 1 and 3 are apparently close together while 2 seems to be a more distant set. For octanoic acid this trend is still recognizable while for the nine other acids the polygons overlap. If one or two FFA (like acetic acid) differ significantly in the three tigers, these values as well as the ensemble of ratios of all the FFA (which will necessarily be different in the three tigers) can serve as the basis for individual distinction. Likewise the ratios and proportions of the other volatiles such as amine, aldehyde, etc. present in MF can also play a role.

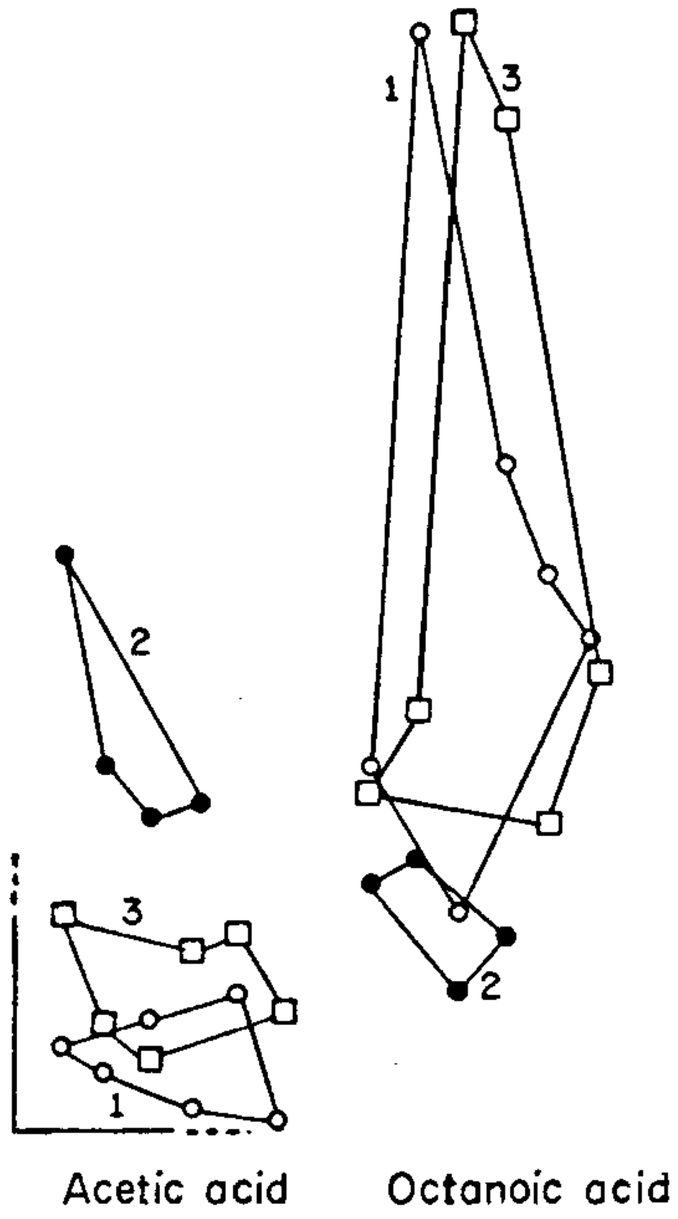


**Figure 1.** X-axis (vertical) represents μg/ml; Y indicates no. of samples for each of the three tigers 1, 2 and 3.

A search for the pedigree of the three tigers as learnt from the zoo staff at Nandan Kanan, Orissa and confirmed by consulting the stud book[5] reveals that tigers 1 and 3 are mother and son respectively while tiger 2, a female, is distantly related to tiger 3. The polygons in Figure 1 do suggest that 1 and 3 are closer to each other than to 2. Stud book numbers of tigers 1, 2, 3 are 186, 358 and 363, respectively.

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# The antiepileptic drug sodium valproate affects body weight in *Drosophila*

*Drosophila* gene *Shaker* (*Sh*) encodes a voltage-sensitive $K^+$ channel[1]. *Sh*-like $K^+$ channels are conserved from bacteria to man[2,3]. Recently, mutations in a gene encoding one such channel has been found to be associated with human epilepsy[4,5]. Sodium valproate (NaVP) is an antiepileptic drug that possibly acts through voltage- and use-dependent blockade of $Na^+$ channel[6–8]. It is also likely to have other activities such as reduction of voltage-dependent $Ca^{++}$ current and GABA-mediated inhibition. A unique side effect of NaVP in human epileptics is weight gain due to appetite stimulation[6,9]. We report here that treatment of Oregon-R (OR) and Canton-S (CS) wild-type, and $Sh^3$, $Sh^5$, $Sh^6$ and $Sh^{14}$ mutant *Drosophila melanogaster* flies with NaVP results in body weight loss in all cases except $Sh^5$. This