

## Insect fossils give new turn to India's ancient past

By Dinesh C Sharma

An insect fossil recovered from coal mines in Gujarat has changed the current understanding of India's geological history. Now scientists say that the drift of the Indian plate from Africa and Madagascar and its collision with the Eurasian plate was a gradual process.

For a long time, it has been believed that the Indian subcontinent mostly remained isolated during its long journey towards the Eurasian plate. This, it was assumed, helped in development of unique plants and living species on the Indian plate.



A new finding – based on analysis of the insect fossils recovered from coal mines near Surat – indicates that there must have been a connection between the apparently cut off India and Europe and Asia around 54 million years ago. This is because of the finding that the fossils of midges found in India are similar to those found elsewhere, making palaeontologists conclude that biting midges must have spread from India to Europe and Asia or the other way round. Small midges –measuring barely a few millimetres - got trapped in tree resin 54 million years ago and became fossils.

The surprising discovery made by an international group of researchers, including Hukum Singh from the Birbal Sahni Institute of Palaeosciences, Lucknow – has appeared in scientific journal *PLOS One*.

"Certain midges that occurred in India at this time display great similarity to examples of a similar age from Europe and Asia," says Frauke Stebner Steinmann Institute at the University of Bonn, who led the study. These findings are a strong indicator that an exchange did occur between the supposedly isolated India, Europe and Asia, says Stebner.

Till now scientists believed that unique species of flora and fauna in the Indian subcontinent was a result of its isolation from other plates, and without any exchange with other continents during the process of continental drift. The supercontinent Gondwana, which included South America, Africa, Antarctica, Australia, Madagascar and India, broke up over the course of geological history. The present day India also began moving towards the north east around 130 million years ago.

It is still not clear how insects were able to spread between drifting India and Eurasia. Stebner assumes that a chain of islands that existed at that time between India, Europe and Asia could have helped the biting midges to spread.

The scientists from the University of Bonn mined for amber in seams of coal near the Surat. They investigated a total of 38 biting midges encased in amber and compared them with examples of a similar age from Europe and China. There was significant conformity with biting midges in amber from the Baltic and Fushun in north-east China, the study says. Scientists from the University of Gdansk, Poland were also part of the research group.

Picture caption: *Gedanohelea gerdesorum* in 54 million-year-old Cambay amber from India (Working group Prof. Ryszard Szadziwski/University of Gdańsk)

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