

News in science

Bacteria start underground fires in Mali

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Patches of mysterious shoe-melting, foot-roasting hot ground in parts of West Africa may have been caused by bacteria, not volcanic activity as has been thought for decades.

A team led by Dr Henrik Svensen of the [University of Oslo](#) in Norway report, in the July issue of the journal [Geology](#), the results of their investigation into baked patches of ground which have been known about in northern Mali for more than a century.

Since about 1960, several authors argued these hot patches of ground were due to volcanic activity. However the researchers have found otherwise. They dug down into areas of ground venting smoke from holes and fractures, and found evidence that the ground itself was burning. They found buried layers of peat - the combustible buried remains of vegetation - apparently igniting spontaneously, and possibly having done so for eons.



Pic: University of Oslo / Volcanic Basin Petroleum Research

"The patterns and speed are typical for the propagation of a smoldering fire front," said Svensen.

The team located the hottest area on the edge of a wide patch of seared ground - exceeding 760 degrees Celsius - near Haribibi in the Lac Faguibine area west of Timbuktu, Mali. They then dug an exploratory trench through the hottest area. What they found was a flaming 830 degrees C layer of peat not more than a metre down.

To see if the peat was being ignited by even more hellacious heat from any molten rock below, they dug a few feet further and checked the temperature again. But the ground under the smoking peat registered a mere 40 degrees C. Further evidence that the fires are not caused by volcanic activity is the fact that the heat ceases during wet weather periods and starts up again during droughts, Svensen reported.

"The reality is that this is a phenomenon that does occur in many, many places around the world," said chemist Dr Bob Finkelman of the U.S. Geological Survey. Only, it's not usually peat that's burning, he said. Normally it's a short-lived fire in oil-rich shale layers started by lightning or a human-caused coal fire burning underground for decades.

In Centralia, in the U.S. state of Pennsylvania, for instance, accidental coal fires have been burning underground for more than 40 years, said Tammy Taylor, an engineer who studies underground fires for Los Alamos National Laboratory.

Unlike coal fires, however, the peat in Mali appears to be ignited spontaneously by heat created by bacterial activity - in the same way that a compost pile can heat up from decay. Dry weather makes the peat tinder dry and the porous ground apparently allows enough oxygen in to keep the ground smoldering.

Larry O'Hanlon - Discovery News