The recent findings in Australian, S. African and Canadian rocks indicate that the hydrocarbon generation by thermal maturation of biogenic kerogen must have been extensive in Archaean sedimentary basins, since prokaryotic organisms started flourishing in early Precambrian times. Convincing evidence of existence of simple life forms in periods as early as 3.8 to 3.85 billion years are also presently known, from findings on samples of apatite grains separated from banded iron formations (BIF) belonging to this age span in Greenland. These grains were found to enclose carbon in the form of graphite unalterably locked up inside them and the isotopic $^{13}C/^{12}C$ ratio of these graphite inclusions showed enrichment of the lighter ^{12}C isotope, a feature typical of biologically derived carbon[7]. Even though the reported occurrence of oil as fluid inclusion in Archaean rocks is interesting and strengthens grounds for existence of flourishing life very early in the earth's history, commercially the finds are not viable breakthroughs, though the extent of the relics suggest that large deposits of oil must have existed in those early times. Undoubtedly, this discovery points to the need for a revision of some of the long established criteria considered necessary for oil formation and their preservation. Scientifically these well-preserved samples are bound to be much sought after as important source materials to study the primeval aquatic biota and other aspects of the early earth.

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SCIENTIFIC CORRESPONDENCE

Nematicidal principle from the fungus *Pleurotus sajor caju*

Cultivation of white button mushroom, *Agaricus bisporus* Lange-Imbach, is catching on in India because of its huge demand in the country itself and in the export market. An important limitation in its cultivation is the attack by myceliophagous nematodes. These nematodes find their way into mushroom houses through various sources, especially water. These nematodes, once introduced, multiply rapidly and cannot be managed with chemicals. Use of nematode-trapping fungi for their management is an attractive possibility[1]. Baron and Thorn[2] suggested the use of *Pleurotus*, an edible mushroom, for destruction of nematodes. In India *Pleurotus sajor caju*, commonly called Dhingari, has shown promise in managing myceliophagous nematode, *Aphelenchoides compositicola*: a serious pest when grown in combination with *A. bisporus*[3]. Here we report the results of experiments on isolation and characterization of a toxin from *P. sajor caju* responsible for toxicity to nematode, *A. composticola*.

The toxin from *P. sajor caju* was isolated following the technique of Frede rick *et al.*[4], and toxicity was tested after every step using laboratory culture of *A. composticola* in water. Straightening of nematodes immediately after addition of 0.1 ml of aqueous extract to one ml suspension of nematodes was taken as a positive reaction. Culture filtrate of *P. sajor caju* (200 ml), having nematicide activity, was concentrated *in vacuo* and dialysed against water with two changes. The two outside fractions containing activity were pooled and once again concentrated in vacuum. This extract was precipitated by adding 10 volumes of methanol and the resulting precipitate was centrifuged off. The supernatant was concentrated and precipitated with 20 volumes of acetone. Precipitates were filtered and dissolved in methanol. The methanol solution was purified by passing it through a column of charcoal. Most of the nematicidal activity was present in this fraction. Toxin was further purified by preparatory TLC on silica plates developed with a mixture of acetone, water, methanol and chloroform in the ratio of 75 : 5 : 10 : 10. It showed entire activity in a spot corresponding to muscarine. Results were confirmed by developing silica plates with a mixture of butanol and dioxane (saturated with water) in the ratio of 4 : 1, and again the toxin spot corresponded with that of muscarine.

Purified toxin was colourless crystalline, highly hygroscopic, thermostable and showed negative reaction with ninhydrin. We suspect this toxin to be muscarine: a toxin commonly present in several mushroom species. This conclusion draws support from the fact that the mushroom *P. sajor caju* is susceptible to insect pests and not to nematode pests[3] as there are differences in their nervous systems. In insects nicotinic effects are predominant[5], whereas in nematodes it is muscarinic effects[6] that are predominant.

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