

Heavy metal contamination in south Indian banana fields

Over 250 soil samples from three south Indian States were studied

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Decades after the pronounced use of chemical fertilizers and pesticides, its negative impacts are reaching new heights with heavy metal contamination now reported in banana fields of South India.

An extensive study of over 250 soil samples from three south Indian States – Kerala, Karnataka and Tamilnadu – has shown that most of the banana fields have amounts of copper, magnesium, chromium and cobalt higher than the threshold levels for normal soils.

Researchers from the Laboratory of Plant Science and Ecology at Mahatma Gandhi University, Kottayam, collected the different soil samples, categorised them according to soil taxonomy and used atomic absorption spectroscopy studies to analyse the level of different heavy metals.

Magnesium content

“We found an unusually high level of magnesium in the fields studied. While the magnesium content of soil in South Indian soil is known to be between 30 and 220 mg/Kg, the average of the samples tested was above 900 mg/Kg,” says Dr. K.S. Nidheesh, from St Joseph’s Universi-



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ty, Dimapur in Nagaland, who is the first author of the work published in *Environmental Science and Pollution Research*. “This is a result of farmers using chemical fertilizers without proper soil testing and applying above the recommended level. As banana is highly prone to insect and nematode attack, they also more pesticides, which get accumulated in the soil.”

Calcium levels almost reaching the threshold were seen in many fields. Calcium is used to maintain the soil pH and over the years has accumulated in the soil. Another heavy metal recorded was manganese, which is a major component of pesticide used against fungal diseases like Fusarium wilt. Though the concentration of iron was high, the authors write it may be due to

the laterite-based soil of the Deccan Plateau. Chromium, which rarely occurs naturally in soil, was detected in all the samples studied, and many samples were at levels near the threshold.

First step

“This is a preliminary report and the beginning of an investigation. More studies are needed to fully understand if the plant is also accumulating the heavy metals. There has been evidence from across the world that banana fruit accumulates heavy metals. More studies in the Indian context and the effect of consuming these fruits also need thorough examination,” adds Prof. Joseph George Ray from the School of Biosciences at the university and corresponding author of the work.