

Pollution making bacteria antibiotic resistant?

In Samples From Contaminated River, 95% Of Microbes Found Immune To Drugs: Study

Washington: Environmental contaminants may be partly to blame for the rise in antibiotic-resistant bacteria, a new US study suggests. J Vaun McArthur from the University of Georgia tested his hypothesis in streams on the US department of energy's Savannah River Site (SRS).

The 802-sqkm site near Aiken, South Carolina, east of the Savannah River, was closed to the public in the early 1950s to produce materials used in nuclear weapons. This production led to legacy waste, or contamination, in limited areas of the site. This waste impacted some of the streams in the industrial areas.



A researcher tested his hypothesis in streams on the Savannah River Site in US. Part of the river was closed to the public to produce materials used in nuclear weapons, which led to its contamination

"The streams have not had inputs from wastewater, so we know the observed patterns are from something

other than antibiotics," said McArthur, a senior research ecologist with the Savannah River Ecology Laboratory

and Odum School of Ecology.

McArthur tested five antibiotics on 427 strains of *E coli* bacteria in the streams. His research team collected samples from 11 locations in nine streams, which included sediment as well as water samples. The level of metal contamination among these locations varied from little to high.

The results showed high levels of antibiotic resistance in eight of the 11 water samples. The highest levels were found at the northern location of Upper Three Runs Creek, where the stream system enters the site, and on two tributaries located in the industrial area, U4 and U8. The level of antibi-

otic resistance was high in both water and sediment samples from these streams. McArthur said Upper Three Runs Creek flows through residential, agricultural and industrial areas before it enters the SRS, so the bacteria in this stream have been exposed to antibiotics.

In contrast, U4 and U8 are completely contained within the site and have no known input from antibiotics. However, they have a long history of inputs from the legacy waste. McArthur conducted a second screening using 23 antibiotics on U4, U8 and U10, a nearby stream with little to no industrial impact.

"More than 95% of the bac-

teria samples from these streams were resistant to 10 or more of the 23 antibiotics," McArthur said.

These included front-line antibiotics — gatifloxacin and ciprofloxacin, used to treat basic bacterial infections from pink eye to urinary tract and sinus infections. The contaminated streams U4 and U8 had the highest level of antibiotic resistance. "These streams have no source of antibiotic input, thus the only explanation for the high level of antibiotic resistance is the environmental contaminants in these streams — the metals, including cadmium and mercury," McArthur said. PT