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"Lead and Fluoride Monitoring in Water and Soil Samples from Claiborne Corridor"

Environmental contaminants such as lead and fluoride from industrial and natural sources pose significant risks to human health. Lead exposure is well-known to be associated with neurodevelopmental deficits and behavioral disorders in children, as well as kidney damage, hypertension in adults, while excessive fluoride intake can result in dental and skeletal fluorosis and related neurological disorders.

The Claiborne Corridor section of Interstate 10 in New Orleans is a high-traffic urban area where residential neighborhoods may be at increased risk of exposure to environmental contaminants. This study aimed to assess the quality of soil and water pollution risk areas along the Claiborne Corridor. A total of 396 soil samples and 11 water samples were collected from public parks located along and outside the Claiborne Corridor. Soil lead concentrations were measured using an X-ray fluorescence (XRF) analyzer (XRF-550), while lead levels in water were determined using the Palintest SA1100. Fluoride concentrations in water samples were measured using an Ion Selective Electrode.

The mean concentration of lead in soil was 93 ppm (range: 5.1 - 1331 ppm). Approximately 11.9% of soil samples exceeded the U.S. Environmental Protection Agency (EPA) regulatory threshold of 200 ppm, whereas about 10.1% of samples had lead levels between 100–200 ppm, and 74.5% fell below 100 ppm. Lead was not detected in 3.5% of the soil samples. Mean concentrations of fluoride in water were 0.65 ppm (0.29–0.84 ppm). All but one sample from Orleans Parish fell within the recommended range for water fluoridation. Water lead concentrations ranged from <2 ppb to 8 ppb.

Soil samples with lead concentrations below 100 ppm may reflect prior remediation efforts. However, samples exceeding 100 ppm, particularly those above 200 ppm, warrant continued monitoring and targeted interventions to reduce potential exposure risks for surrounding communities.