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***Short Commiuncation***

# Urban Soils Contaminated with Heavy Metals Partnering with Soil Ecology and Tillage for Sustainable Agriculture

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**Abstract**

The investigations on heavy metal contamination that have been conducted over the past ten years in several Chinese cities are reviewed in this study. In this study, heavy metal concentrations, sources, contamination levels, sample collecting methods, and analytical instruments were compared and discussed in great detail for urban soils, urban road dusts, and agricultural soils. According to the findings, practically every concentration of Cr, Ni, Cu, Pb, Zn, As, Hg, and Cd is greater than background soil levels in China. The levels of heavy metal contamination throughout the cities differ widely. According to the geoaccumulation index, urban soils and road dusts in cities are heavily contaminated with Cr, Ni, Cu, Pb, Zn, and Cd. In general, Cu, Pb, Zn, and Cd contamination levels are higher than those of Ni and Cr. Additionally, anthropogenic sources of Cd, Hg, and Pb have a substantial impact on agricultural soils. According to the integrated pollution index (IPI), heavy metal contamination levels are higher in the urban soil and road dust of industrial and developed cities. The levels of metal pollution in urban road dusts are higher than those in urban soils in the cities of Shanghai, Hangzhou, Guangzhou, and Hong Kong, according to a study of the IPIs of heavy metals in urban soils and urban road dusts from these cities. Additionally, the primary sources of the metals in agricultural soils, urban traffic dusts, and urban soils vary.( Whitehorn PR et al.,2012)

The soil is home to a large portion of an agroecosystem's biodiversity. The functions of soil biota have significant direct and indirect effects on crop growth and quality, soil- and residue-borne pests, disease incidence, the efficiency of nutrient cycling, water transfer, and, ultimately, crop management systems' ability to persist. Whether on purpose or accidentally, farmers control soil biodiversity through tillage. Given the significance of soil biota, one of the major challenges in tillage research is understanding and predicting the effects of tillage on soil ecology. This is important for both assessing the impact of tillage on soil organisms and functions as well as designing tillage systems that make the best use of soil biodiversity, particularly for crop protection. In this essay, we begin by discussing (Ding W et al., 2016).

**Keywords:** Heavy metal, Urban soils, Urban road dusts, Agricultural soils, TillageSoil ecology, Agroecosystems

## INTRODUCTION

(Miranda JL et al ., 2014) The characteristics of heavy metals in agricultural soils, urban traffic dusts, and urban soils are currently current issues. This fact has been amplified in recent years, which is widely documented. The improvement is probably explained by the possible damage to the general public's health that comes from consuming heavy metals. Heavy metals in urban soils and road dusts can enter the body by direct inhalation, ingestion, and skin contact and accumulate there However, it has been determined that the main route for human exposure to environmental heavy metals in agricultural areas is through the soil-crop system. According to several studies, anthropogenic sources account for the majority of the pollution sources for heavy metals in the environment. Traffic emission (vehicle exhaust particles, tyre wear particles, weathered street surface particles, brake lining wear particles), industrial emission (power plants, coal combustion, metallurgical industry, auto repair shop, chemical plant, etc.) domestic emission, weathering of building and pavement surface, atmospheric deposited, and other sources are among the anthropogenic sources of heavy metals in urban soils and urban road dusts. However, human activities such as mining, smelting, waste disposal, urban effluent, vehicle exhaust, sewage sludge, pesticides, and fertiliser application are the main sources of heavy metals in agricultural soils(Jiang R et al ., 2021).

With China's fast industrialization and urbanisation over the past 20 years, heavy metal contamination in urban soils, urban traffic dusts, and agricultural soils has gotten much worse. According to Cheng (2003), although China's geological background levels of heavy metals are low, anthropogenic activities over the past few decades have resulted in heavy metal pollution of the soil, water, air, and plants in some situations that have been examined. As a result, over the past ten years, several research related to heavy metal contamination in urban soils, urban traffic dusts, and agricultural soils in various cities have been conducted. The schematic map of China shows the relevant cities (Su J et al., 2018).

However, there hasn't been a systematic collection and comparison of quantitative data on heavy metal concentrations, contamination levels, and pollution sources. Therefore, the focus of this study is on heavy metal pollution in Chinese agricultural soils, urban traffic dusts, and urban soils. This document clarifies the sources, concentrations, contamination levels, sample collection, and analytical methods of heavy metals. The integrated pollution index (IPI) of heavy metals in urban soils and urban road dusts is discussed, as well as their spatial distribution in Chinese cities.

# CONCLUSIONS

Almost all of the determined metal concentrations in urban soils, urban road dusts, and agricultural soils in the cities are greater than their background values, according to the metal concentrations. With the exception of Cu in the urban road dusts of Xi'an and Urumqi, all the cities have concentrations of Cu, Zn, and Cd that are higher than their PTE-MPC. Nearly all metal concentrations in urban soils in cities, however, are lower than their PTE-MPC. Additionally, agricultural soils have greater levels of Cd and As than their PTE-MPC.

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# CONFLICTS OF INTEREST

The author has no known conflicts of interested associated with this paper.

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