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METRONIDAZOLE IN SOIL: IMPACTS ON GERMINATION AND BIOASSIMILATION IN TOMATO (L. esculentum) AND BASIL (O. basilicum)

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The presence of emerging contaminants, such as pharmaceutical products (PPs), represents a global concern due to their potential adverse ecological effects and human health risks[1]. The release of these compounds into the environment, often through agricultural waste and sewage sludge, can lead to their uptake and accumulation in cultivated plants, thus introducing PPs into the human food chain[1,2]. Metronidazole (MNZ), a widely used nitroimidazole antibiotic, is a contaminant of interest due to its persistence and capacity to interact with living organisms[3]. In this study, we investigated the impact of MNZ contamination on the early developmental stages of tomato (*Lycopersicum esculentum*) and basil (*Ocimum basilicum*). Seeds were germinated and specimens cultivated in soils containing MNZ at concentrations of 250, 500, and 750 mg kg^{-1} and compared to a control group (uncontaminated). Germination and survival rates were evaluated, and the results showed they were similar between the plants in contaminated environments and the control. The ability of both species to germinate and develop even in the presence of the contaminant suggests the existence of tolerance or degradation mechanisms, making them promising for future investigations into detoxification and bioaccumulation. To assess contaminant assimilation, methanolic extracts from roots and aerial parts (stem+leaf) were analyzed by thin-layer chromatography, using a mobile phase of BuOH:CH_3COOH:H_2O (4:1:1,v/v/v), detection was performed under UV light at 254 nm. Through image densitometry, it was possible to semi-quantify the MNZ, confirming its presence in tomato specimens at all levels of contamination and in basil only at the 750 mg kg^{-1}. The results indicated a predominance of the contaminant in the roots, with evidence of its translocation to the aerial parts, demonstrating that root uptake is a key pathway for assimilation. This study highlights the importance of monitoring the presence of PPs in soil and evaluating the risks associated with their uptake by edible plants.

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2 Pérez-Lucas G, Navarro S (2024) *J. Xenobiot.* 14,1343–1377

3 Jjemba PK (2002) *Chemosphere*. 46, 1019-1025.

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