



Bioaccessibility of environmentally aged soil-bound ¹⁴C-atrazine residues

N. D. Jablonowski, J. Modler, P. Burauel

Institute of Chemistry and Dynamics of the Geosphere, ICG-4 – Agrosphere,
Forschungszentrum Jülich GmbH, 52425 Jülich, Germany (n.d.jablonowski@fz-juelich.de /
Phone: +49-2461-61-2696 / Fax: +49-2461-61-2518)

The processes and behaviour of pesticides in the environment was subject of numerous investigations and is of present concern. Atrazine [2-chloro-4-

(ethylamino)-6-(isopropylamino)-s-triazin] was one of the worldwide most applied herbicides which are still used in several countries of global influence. Impact of this herbicide on human health, groundwater contamination and environmental risk assessment is of continuous interest for soil and environmental management. Formation of soil bound residues with increasing residence time of the herbicide in the soil matrix must be seen under consideration of bioavailability and bioaccessibility as a main half-life determining process in the environment.

Bioaccessibility of naturally long-term aged (>22 years) bound residues of atrazine was found to be possible. Consecutive extraction of soil containing ¹⁴C-atrazine residues aged under environmental conditions followed by microbial exposure of the organism *Pseudomonas* spec. strain ADP showed total release of residual atrazine ¹⁴C-radioactivity of 12.1 % using mineral media, 18.03 % using mineral media containing citrate or 6.1 % in case of water, respectively. Kinetics of microbial mineralization of ¹⁴C-atrazine residues reached 2.34 % for mineral media and 2.39 % using mineral media plus citrate amendment after 26 days of incubation under soil slurry conditions. Soil-slurry incubation with water only showed smaller extents of mineralization of 1.49 % in the same interval. Even though microbial mineralization is small the results indicate possible bioaccessibility of aged, soil-bound atrazine residues after

22 years of aging under field like conditions.