PHOSPHONATES
EUROPE

POSITION PAPER

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Questioning assumptions and experimental conditions: A critical review of the Tübingen glyphosate Thesis[1,2]

The purpose of this paper is to strongly refute the claims presented in papers published by the University of Tubingen, which attribute the presence of glyphosate in the environment to the degradation of aminomethylene phosphonates used in household laundry detergents.

There are serious flaws in the experimental work described in these papers which are set out below:

- There are significant differences between the experimental conditions and the real-world situation, therefore read across to wastewater treatment plants is not justified.
- The DTPMP concentration used in the experiments is between 10,000 – 20,000 times higher than typical inflow levels (see Rott et al.).
- Due to its strong binding characteristic, in environmental conditions, DTPMP is always present as a metal complex and not as pure substance.
- Materials used for testing purposes were used in acid form thus exceeding the buffering capacity of the wastewater in terms of acidity, so that a pH value of 2-3 in the experiments can be expected.
- The paper claims that manganese oxide is responsible for the degradation of DTPMP via an oxidation pathway. Typical activated sludge has a manganese level of 1-2 ppm when coagulants which can contain trace levels of manganese are used as intended. This is in sharp contrast to the levels used in the experiments.
- There is no conclusive proof presented that the degradation pathways postulated in the papers can occur under real-world conditions.

Furthermore, the relevance of these findings is questionable. The authors claim a 1-3 ng/L increase in glyphosate levels through the described conversion. Such a small amount represents 1 to 3% of the limit value for glyphosate in drinking water of 0.1 µg/L and cannot be determined with currently available analytical techniques.

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[1] Röhnelt, A.M., Martin, P.R., Athmer, M. *et al.* Glyphosate is a transformation product of a widely used aminopolyphosphonate complexing agent. *Nat Commun* **16**, 2438 (2025). https://doi.org/10.1038/s41467-025-57473-7

[2] Engelbart et al. "In-situ formation of glyphosate and AMPA in activated sludge from phosphonates used as antiscalants and bleach stabilizers in households and industry", Water Research 280 (2025) 123464. https://doi.org/10.1016/j.watres.2025.123464

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Earlier University of Tubingen papers on this topic[1,2] claimed this link between DTPMP and glyphosate based on the analysis of river water and sediment data collected from sources across Europe and North America. The authors concluded based on a lack of seasonality that there must be another source of glyphosate than agricultural uses.

Referring to the alleged use of glyphosate in European agriculture since only the mid-1990s and an analysis of sediment layers of a water body, the authors speculated that there must therefore be other sources of glyphosate that led to its presence as early as the 1950s and 60s. To contextualize and correct this thesis, it should be noted that glyphosate was approved for agricultural use in Europe as early as 1974. Whereas the first scientific publication on the economical production of aminomethylenephosphonates was not until 1966. Moreover, the industrial use of aminomethylenephosphonates, especially DTPMP, in detergents did not occur until the end of the 1990s. It is therefore impossible that the levels of glyphosate measured in these sediments could have originated from DTPMP.

Conclusion

The claims made by the University of Tübingen regarding glyphosate formation from DTPMP degradation are scientifically unsubstantiated. The experimental conditions presented differ markedly from those in actual wastewater treatment environments, and the concentrations used are unrealistically high. Furthermore, the historical timeline of glyphosate and phosphonate use contradicts the proposed causal link. Based on current evidence and analytical limitations, the suggested pathway lacks credibility and relevance. With this position paper, Phosphonates Europe aims to reaffirm the importance of sound scientific methodology and accurate contextual interpretation in environmental research.

Phosphonates Europe remains available for any further questions or for open and constructive dialogue. The opportunity for continued discussion on this important subject is welcomed.

Interesting readings:

- Behavior of PBTC, HEDP, and Aminophosphonates in the Process of Wastewater Treatment (Rott et al. *Water* (2020), **12**, 53. doi:10.3390/w12010053)
- Retention and transport of glyphosate into groundwater via adsorptive effects on colloidally dissolved particles (Cicilinski et al. *Chemosphere* (2025), **371**, 144075. doi:10.1016/j.chemosphere2025.144075; Gros et al. *Sci. Tot. Environm*. (2017), **586**, 527. doi:10.1016/j.scitotenv.2017.02.007)
- Plant tolerance to and storage of glyphosate in certain plant parts over long periods of time (Mamy et al. *Chemosphere* (2016), **154**, 425. doi:10.1016/j.chemosphere.2016.03.104; Nordmeyer and Stähler, *Journal für Kulturpflanzen* (2017), **69**, 264. doi:10.1399/JrK.2017.08.03; Edge et al., *Forests* (2021), **12**, 601. https://doi.org/10.3390/f12050601

- Dependence of biological degradation in soil on temperature, soil moisture, soil type, microbiome, phosphate content (Bento et al. *Sci. Tot. Environm*. (2016), **572**, 301. doi:10.1016/j.scitotenv.2016.07.215; Bento et al. *Environm. Poll.* (2017), **220**, 1079. doi:10.1016/j.envpol.2016.11.033)
- Airborne transport of glyphosate used in agriculture via fine soil particles (dust) over thousands of kilometers ((Silva et al. *Sci. Total Environm.* (2018), **621**, 1352. doi: 10.1016/j.scitotenv.2017.10.093; Bento et al. *Environm. Poll.* (2017), **220**, 1079. doi:10.1016/j.envpol.2016.11.033; Farenhorst et al. *Water Air Soil Pollut* (2015), **226**, 47 doi:10.1007/s11270-015-2343-4).

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