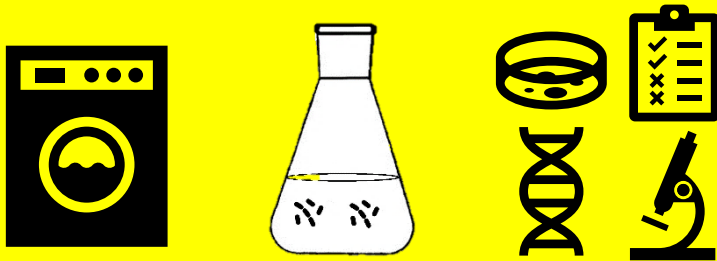


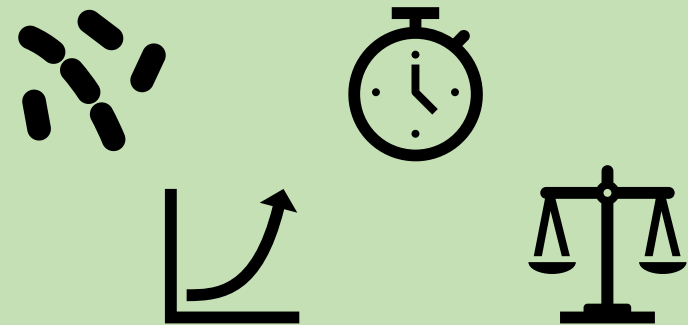
Phosphonate degradation by laundry isolate *Delftia* sp. UMB14

Ramona Riedel, Karsten Meißner, Arne Kaschubowski,
Marion Martienssen and Burga Braun

Isolation and Characterization

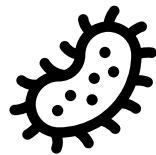


Biodegradation



Identification and Characterization

- 27 bacterial isolates (HEDP, EDTMP)

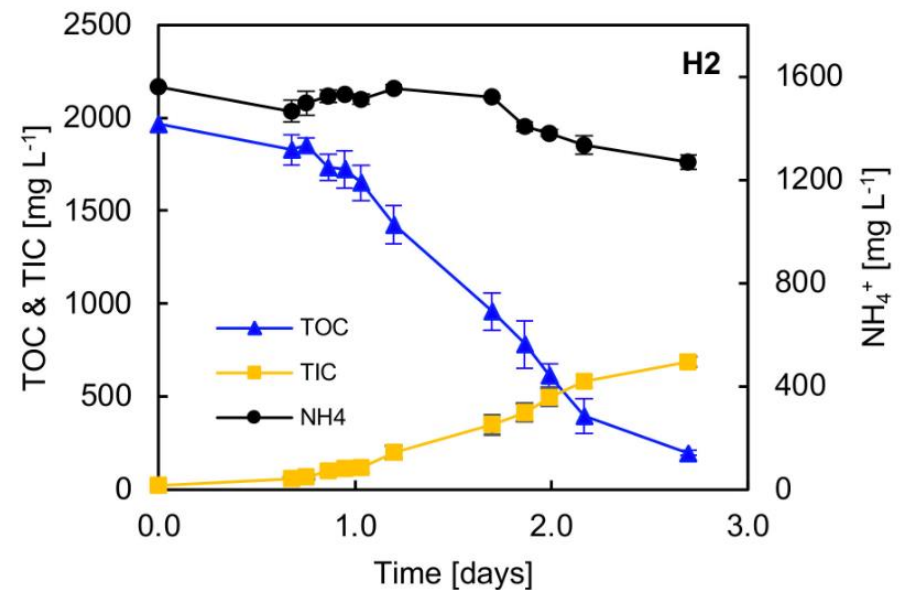
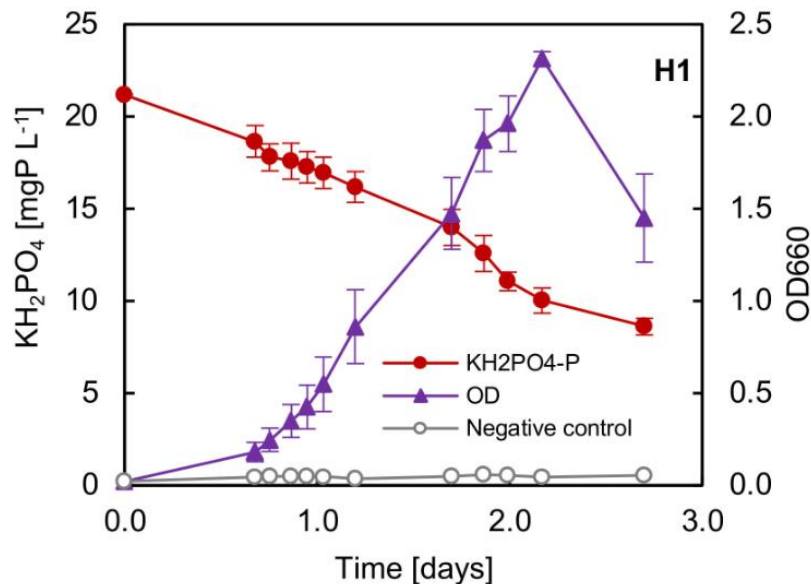


Delftia sp. UMB14

- Isolated from detergent drawer
- Enriched in HEDP
- Utilization of D-malic and D-mannitol
- Multidrug resistant
- No *phnJ* gene (C-P lyase)
- Possesses phosphonoacetaldehyde hydrolase gene *phnX*

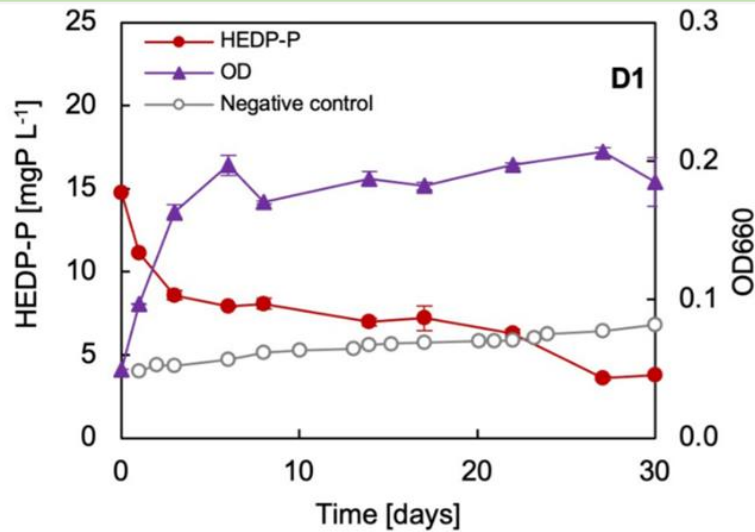
Biodegradation assays

Positive control (KH_2PO_4)

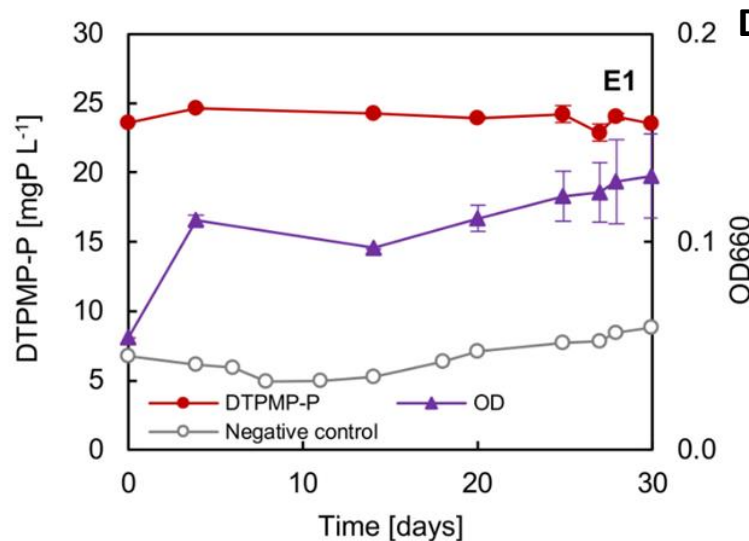
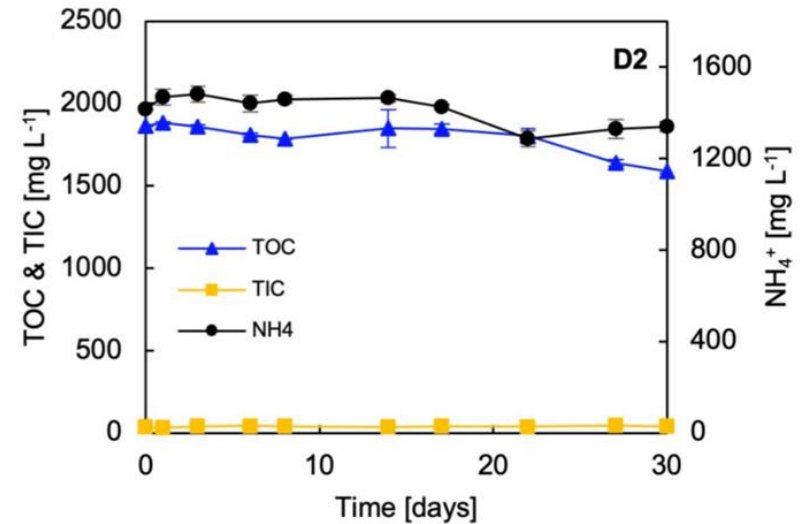


- Batch assay with tap water based medium
- C/N-source: ammonium acetate
- Trace element solution (SL8)
- P-source: 20 mgP/L as ortho- PO_4^{3-}
- Growth via optical density (OD 660)

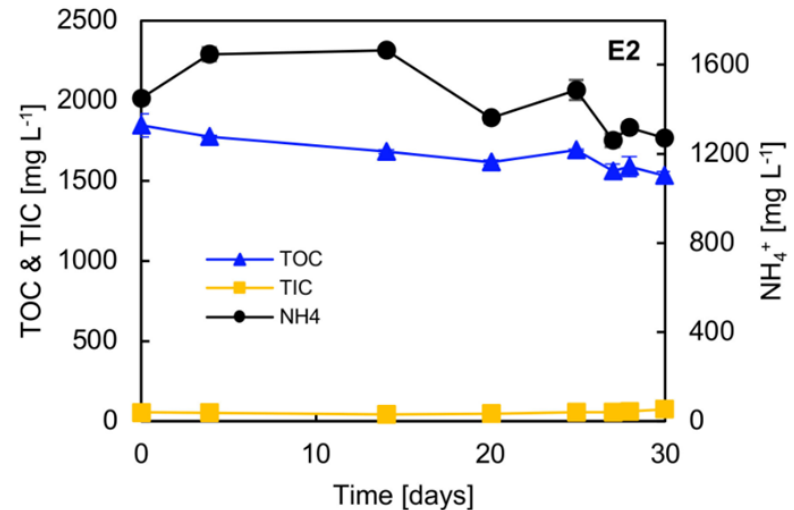
Biodegradation assays



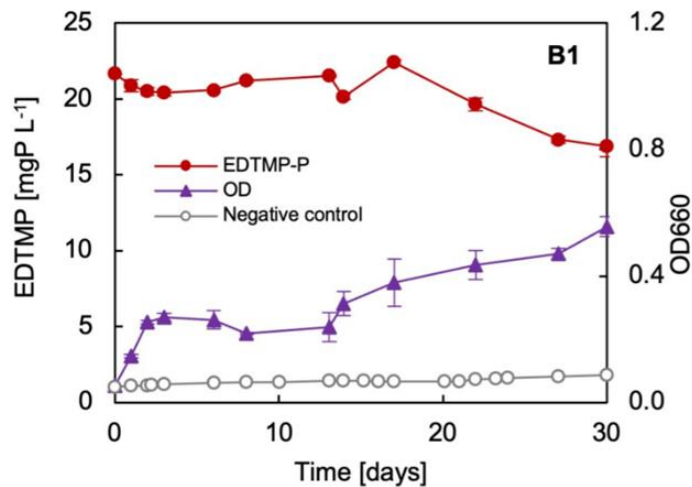
HEDP



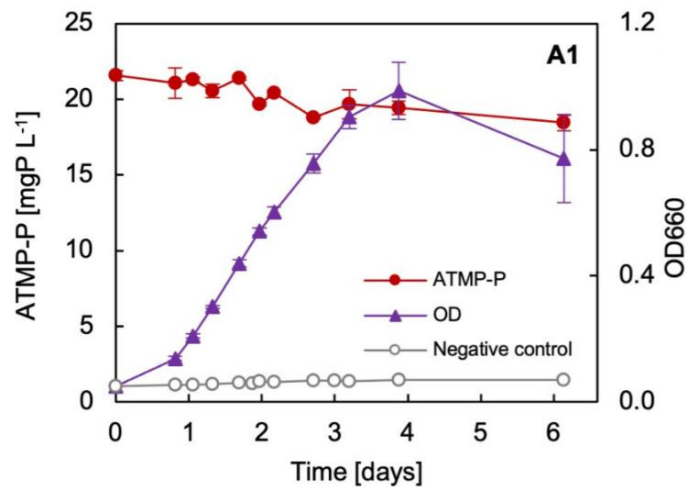
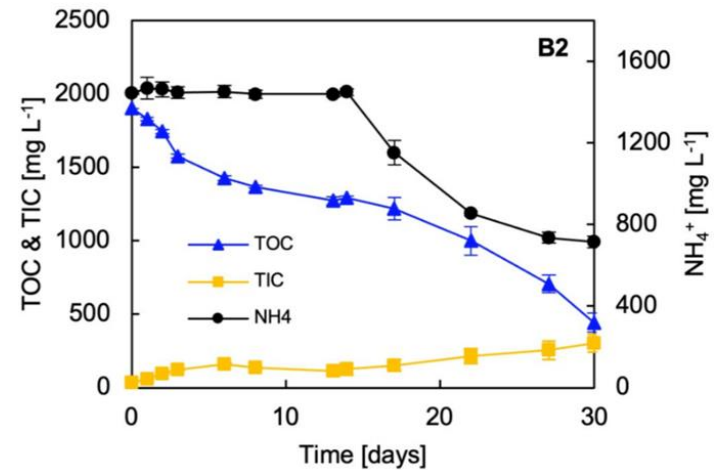
DTPMP



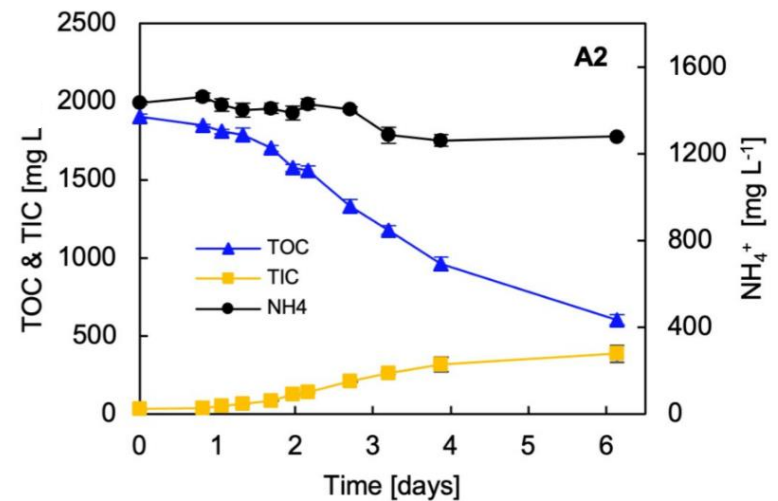
Biodegradation assays



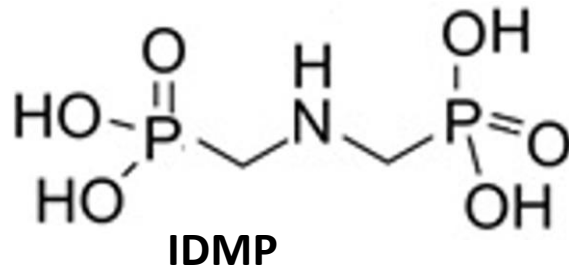
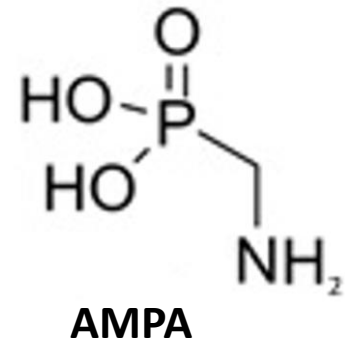
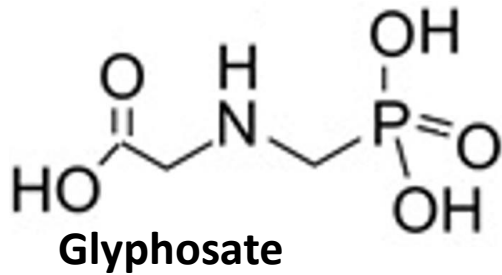
EDTMP



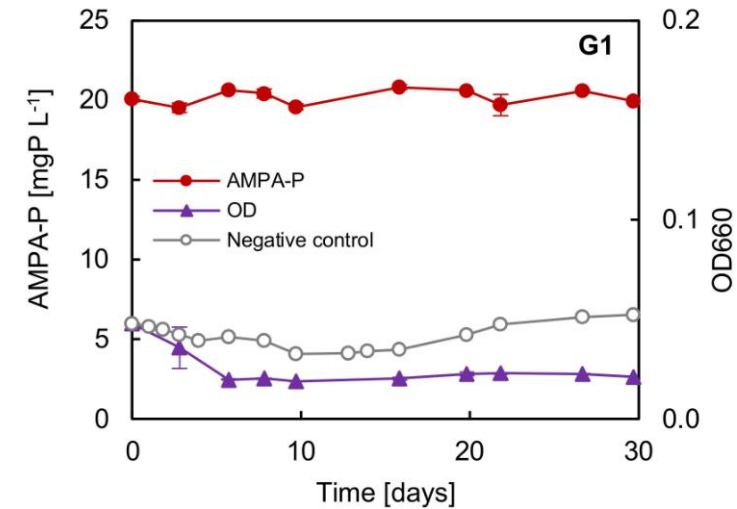
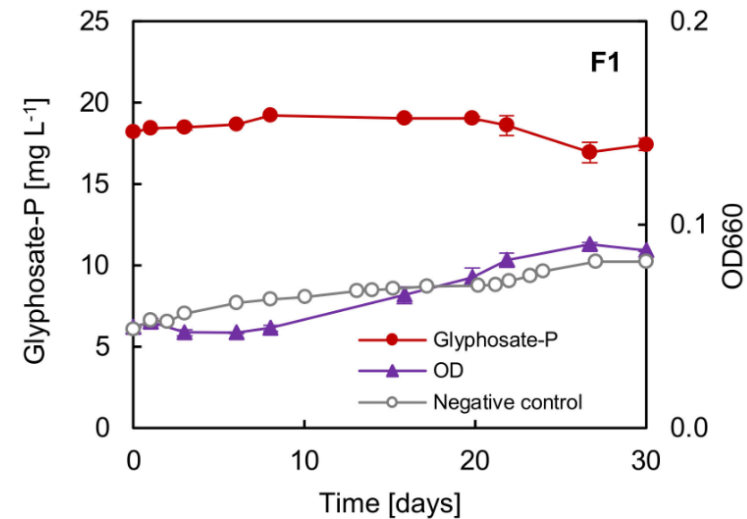
ATMP



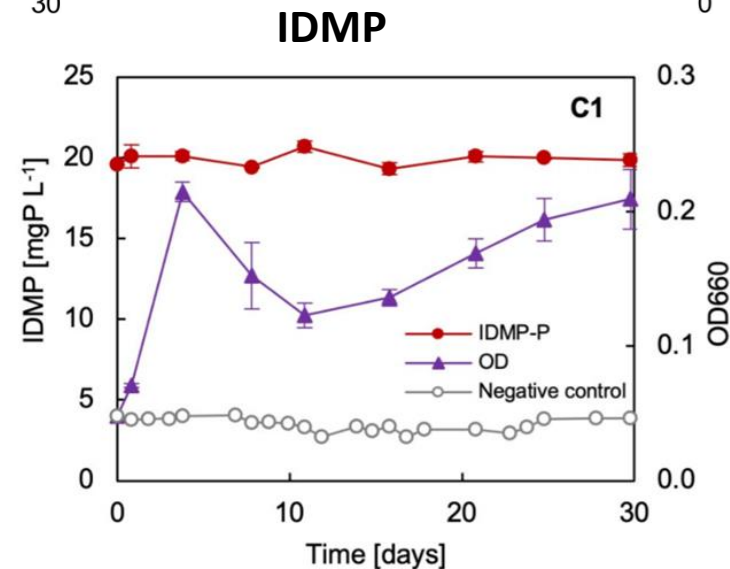
Biodegradation assays



Biodegradation assays



Glyphosate



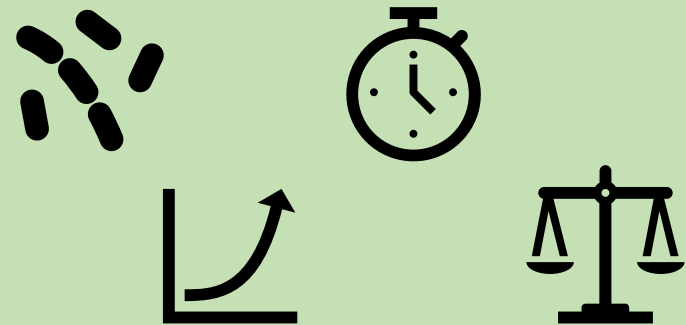
AMPA

Isolation and Characterization



- **27 isolates** from washing machines
- different **genetical preconditions**
Delftia sp. UMB14:
phosphonoacetaldehyde hydrolase PhnX

Biodegradation

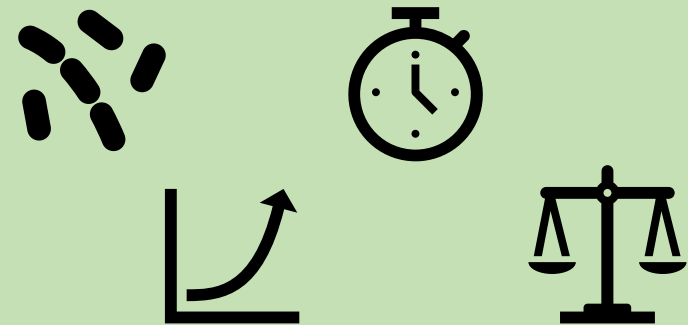


- Biodegradation batch tests in **tap water based medium**
- **P-utilization:**
ATMP > EDTMP > IDMP > HEDP > DTPMP
- **No growth:** glyphosate, AMPA

Isolation and Characterization



Biodegradation



Thank You!

Acknowledgments

Thanks to Ramona Riedel ¹, Arne Kaschubowski ², Marion Martienssen ¹ and Burga Braun ²

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We are also grateful to Kathrin Krahle and Kai Buder for their technical support. The skillful technical assistance of Stefanie Arndt, Tatjana Fritscher-Klöppel, and Konstantinos Xouveroudis is also highly appreciated.

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