



UNIVERSITY OF APPLIED SCIENCES

Migratox



Summary & Outlook

Summary: Achievements in Migratox Project

- **Selection of Bioassay Battery**

- Comparison of 8 different genotoxicity assays, selection of miniaturized Ames test



- **Sample preparation:**

- Development of 2 sample preparation methods, concentration factor 300 – 2.000
 - Possible: 10 - 95% ethanol, 3% Acetic Acid, not possible: Olive Oil, Tenax



- **Sensitivity:**

- Approx. 5-fold Improvement by Miniaturization of Ames Test
- Further Improvement with the optimized miniaturization format Ames Sense



- **Validation:**

- Whole method validated, Intra- and Interlaboratory Studies prove reliability



- **Sample Screening:**

- >250 samples tested: Mutagenicity very rare in virgin materials: e.g. sometimes connected to epoxy monomers in coatings.
- Alarming mutagenic activities uncovered in recycled (non-deinked) printed polyolefins



Summary: Achievements in Migratox Project

• Standardization

• ILSI Expert Group Recommendations

(published in *Food Additives & Contaminants: Part A* (2019), 36(12), 1903-1936)

- Migratox Strategy aligned with ILSI Expert Group, Migratox Research (e.g. Detection Limits) important input to Expert Group publication

• Methods published in Scientific Journals:

- *Rainer, Mayrhofer et al* (2019). *Food Additives & Contaminants: Part A*, 36(9), 1419-1432.
- *Pinter, Elisabeth, et al. Foods* 9.2 (2020): 237.

- Activity at AOAC, Presentation to Authorities (AGES, ANSES, EFSA)



• Regulatory Acceptance of Migratox Methods:

• Industry Self Assessment:

- Part of NIAS Assessment (together with chemical analysis)
- Support Classification of Unknowns as Cramer Class III

• Submission of Dossiers to Authorities: e.g. for positive list

- Full OECD format Ames Test + Micronucleus required!

• Substitution of required target analysis for mutagens

- In case of suspicions: Target Analysis always required!



Migratox - End of the Project, but Research goes on!

> Funded FFG Project No. 866854 "Migratox" is finished!

> **But: The research goes on!**

Method Development & Validation

Project Migratox

Application of developed Methods

Project PolyCycle:
Application for recycled
Plastic

Project SafeCycle: Identification of
sources for mutagenicity

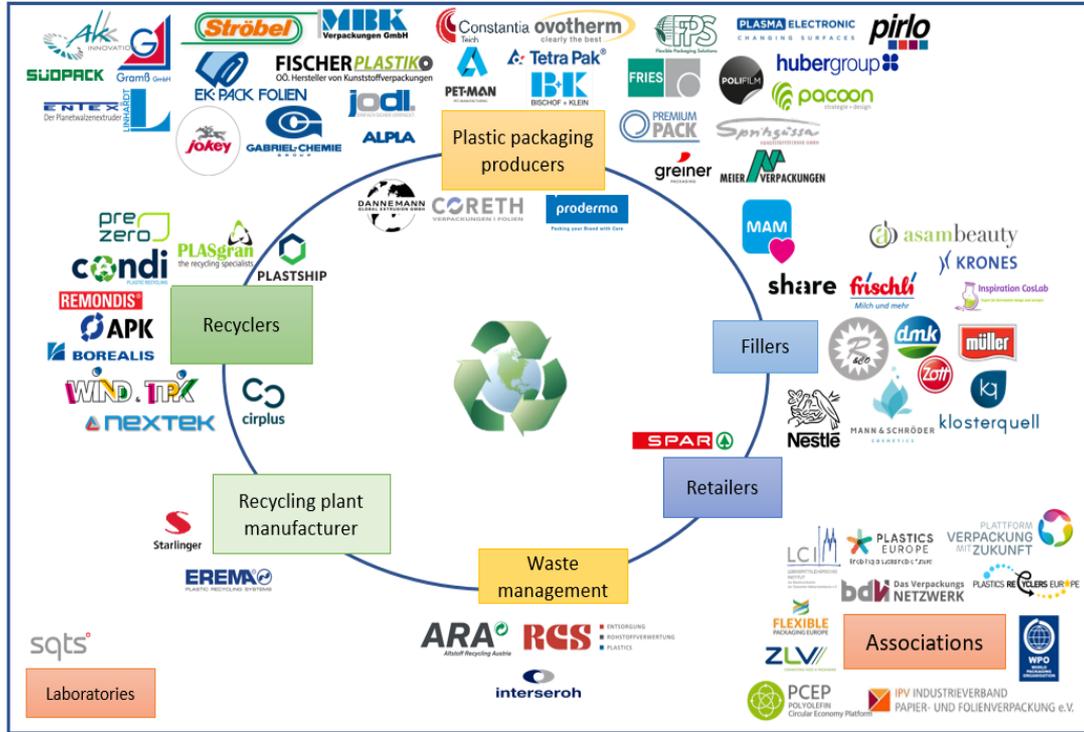
Project Pack2theLoop: Evaluation
of Recycling Loops

Project MOSH-MOAH: Migratox-Methods
for Mineraloil contamination

Project SustainFibresFCM: Migratox Methods
for Alternative Fibre Materials

Routine Testing with Migratox Methods

Project SafeCYCLE: Application of Migratox Methods for Recycling



Research goes on!

Authorities
 Bundesministerium
 Soziales, Gesundheit, Pflege
 und Konsumentenschutz

of developed Methods

Project SafeCycle: Identification of sources for mutagenicity

2theLoop: Evaluation of Recycling Loops

Project MOSH MOAH: Migratox-Methods for Mineraloil contamination

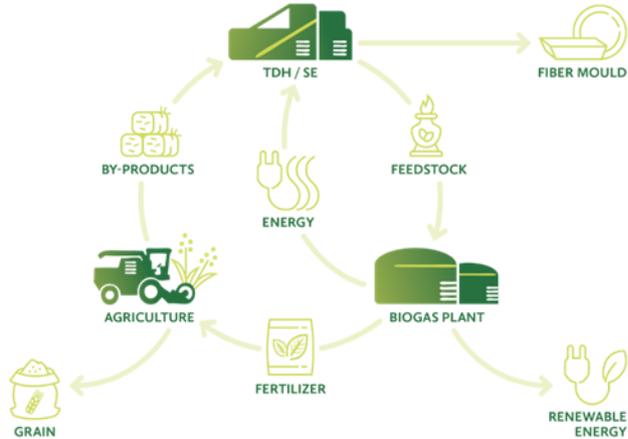
Project SustainFibresFCM: Migratox Methods for Alternative Fibre Materials

Routine Testing with Migratox Methods

Project, but Research goes on!

Project: *SustainFibreFCM*
Migratox Methods as Part of a
Safety by Design Approach

854 "Migratox" is finished!



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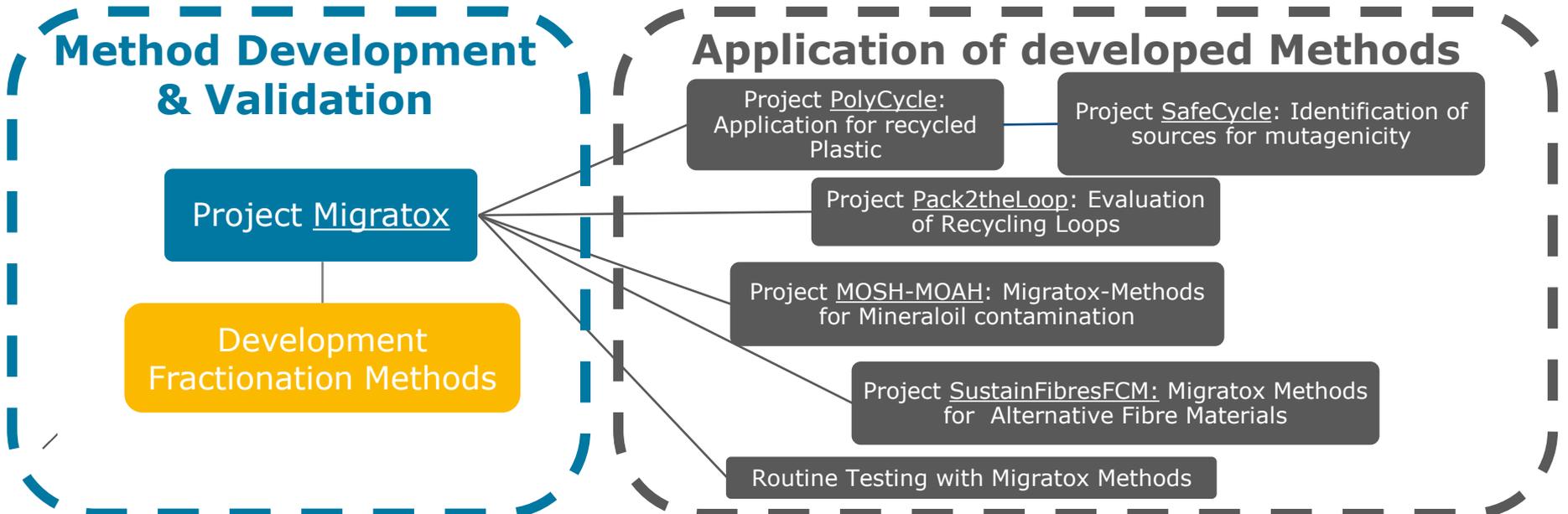
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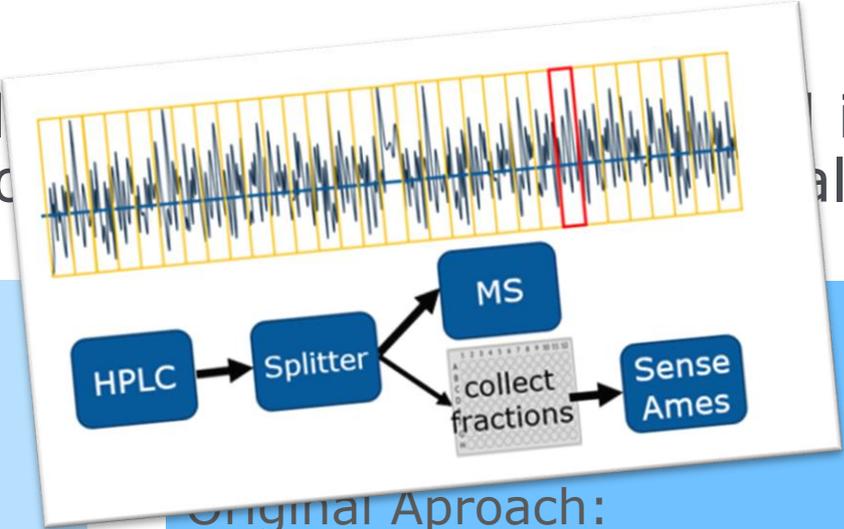
Effect-detection by planar SOS-Umu-C genotoxicity bioassay and chemical identification of genotoxins in packaging migrates, proven by microtiter plate assays SOS-Umu-C and Ames-MPF

C

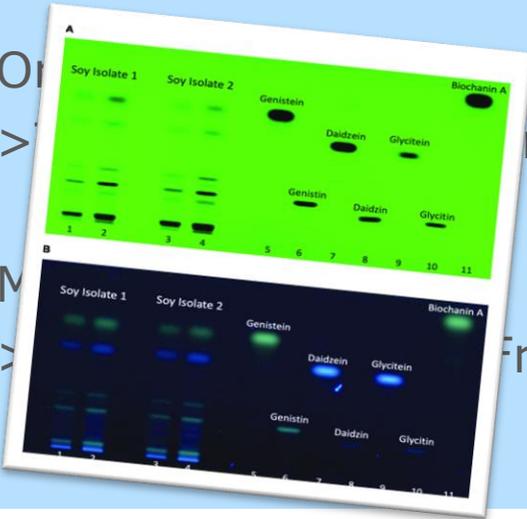
[Daniel Meyer](#)^a, [Maricel Marin-Kuan](#)^b, [Elisa Mavrhofer](#)^c, [Christian Kirchnawy](#)^c,
[Emma Debon](#)^b, [Helia Latado](#)^b, [Amaury Patin](#)^b, [Benoît Schiller](#)^b,
[Gertrud Morlock](#)^a  

Bio
d

ed to



in
analysis



Fractionation

Original Approach:

> Testing whole mixture

Modern Approach?

> Chromatographic Fractionation (HPTLC, HPLC, SPE?)

Research goes on: Biodetection: >30 years behind in development compared to instrumental chemical analysis

Still many open questions!

First Experience as part of Migratox Project:

- Many positive results when using umu-c bioassay coupled to Thinlayer Chromatography
 - Due to improved Detection Limits?
 - Risk of false/misleading positives??
- Insufficient detection limits with normal Ames, but promising approach with Ames Sense

Modern Approach:

> Chromatographic Fractionation (GC, HPLC, IC)

Biodetection

Original Approach:

Testing whole mixture

Modern Approach?

> Chromatographic Fractionation (HPTLC, HPLC, SPE?)

Migratox ends, Research goes on:

> Offer for interested companies:

> Membership after End of funded Project still possible:

> Same Advantages, same Conditions:

> Analysis of your own samples for all research supporters

> 7 samples (10.000€), 3 samples (5.000€)

> Results from analysis as „early warning“ and as additional support for difficult NIAS analysis

> Information, update, possibility to influence the direction of new developments

> We will get in touch to discuss your personal wishes

Thank You
for the active Participation
and the Valuable Input!

Tomorrow: Symposium at different Location!

Advances in Safety Assessment of Packing Materials -
January 25th, 2024



Supporters



- > 25.01.2024 at FH Campus Vienna (Hybrid Meeting)
- > 09.30: Breakfast and coffee
- > 10.00: Start of Conference

Important!

Different Location:

Favoritenstrasse 226, 1100 Vienna

(near U1 Station „Altes Landgut“)



Thank you for your attention!

Open Questions?

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