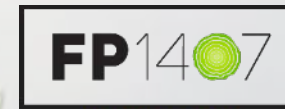




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ModWoodLife



Performance of bio-based building materials



# Alternative oil-based wood preservatives utilizing low-value products from the olive industry

Matthew Schwarzkopf, Andreas Treu, Viacheslav Tverezovskiy, Michael Burnard,  
Andreja Kutnar

University of Primorska, Andrej Marušič Institute  
Koper, Slovenia

# Introduction



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- Istrska belica
  - Leading cultivar in Slovenia – 70 %
  - Resistant to low temperatures
  - High oil content
  - Good taste
  - Monounsaturated fatty acids
  - Relatively high levels of phenolic compounds



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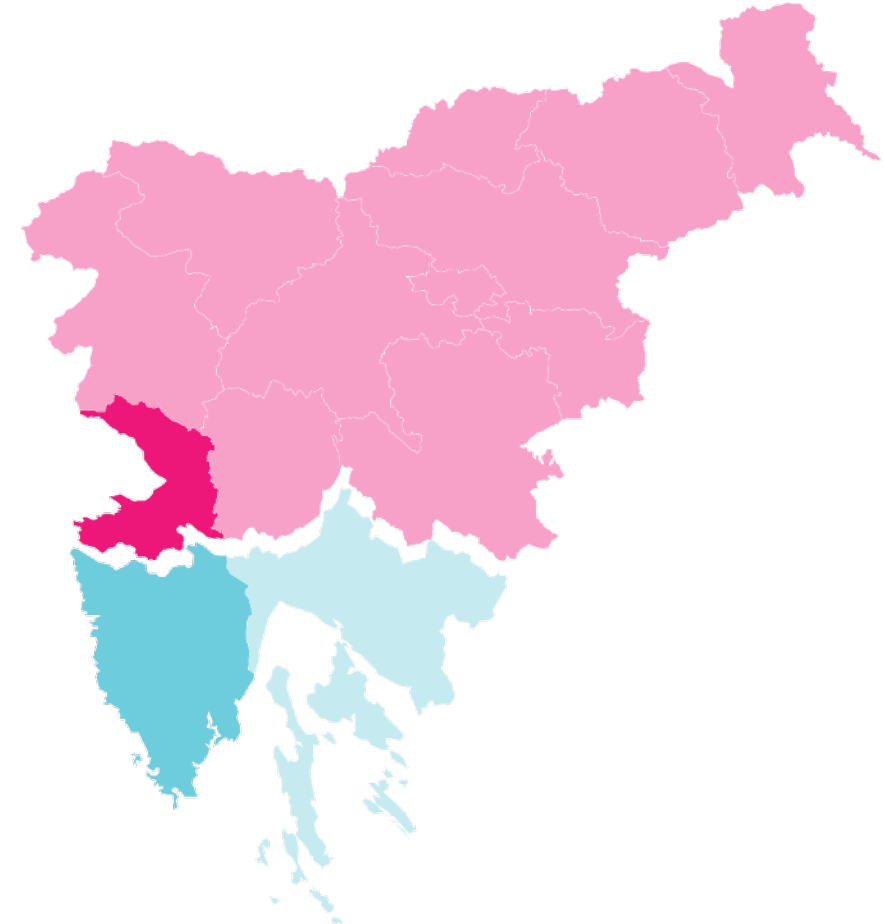
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# Starting Materials



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- Agricultural Residue
  - Leaves
  - Branches
- Olive processing products
  - Wastewater  $\approx$  50 %
  - Pomace  $\approx$  30%
    - Pomace Oil
  - Virgin Olive Oil  $\approx$  20 %
    - Extra Virgin
    - Virgin
    - Lampante



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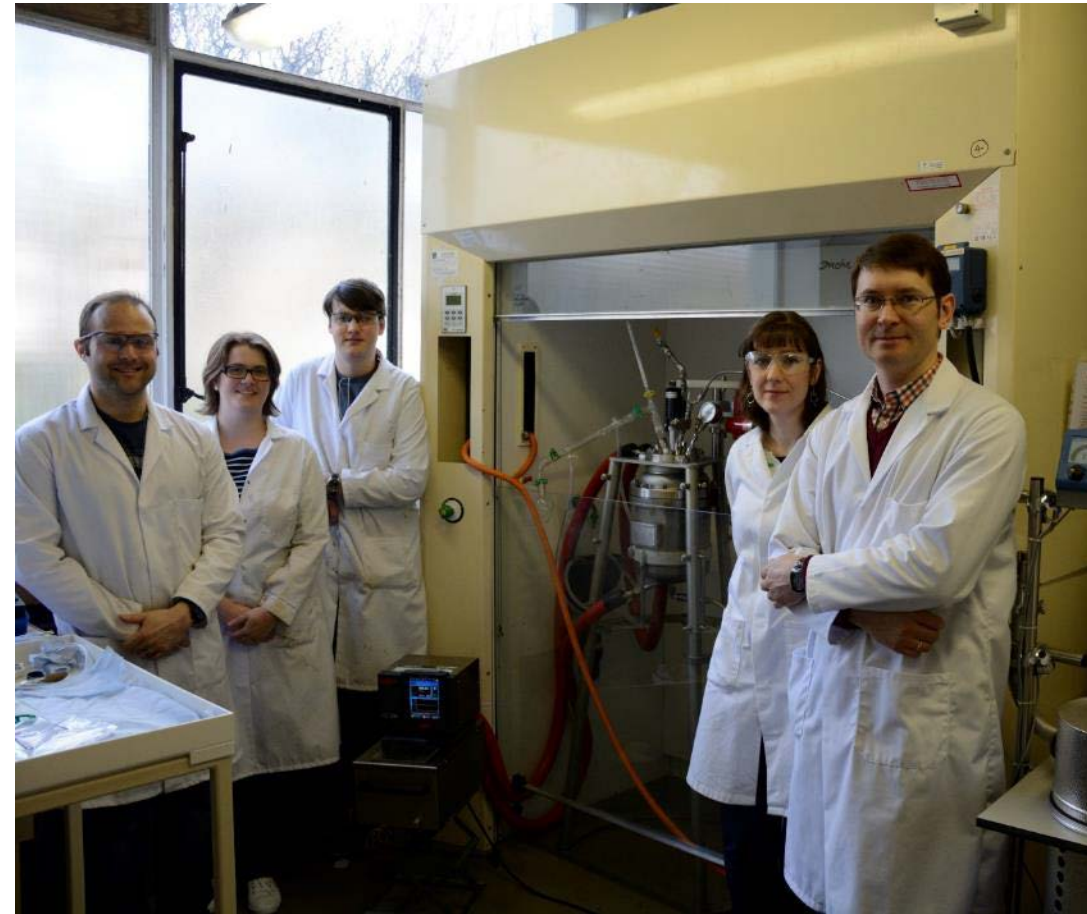


# FP 1303 STSM

- BioComposites Centre – Bangor, Wales
- 2 weeks in April
- Specializing in modification of renewables like vegetable oil



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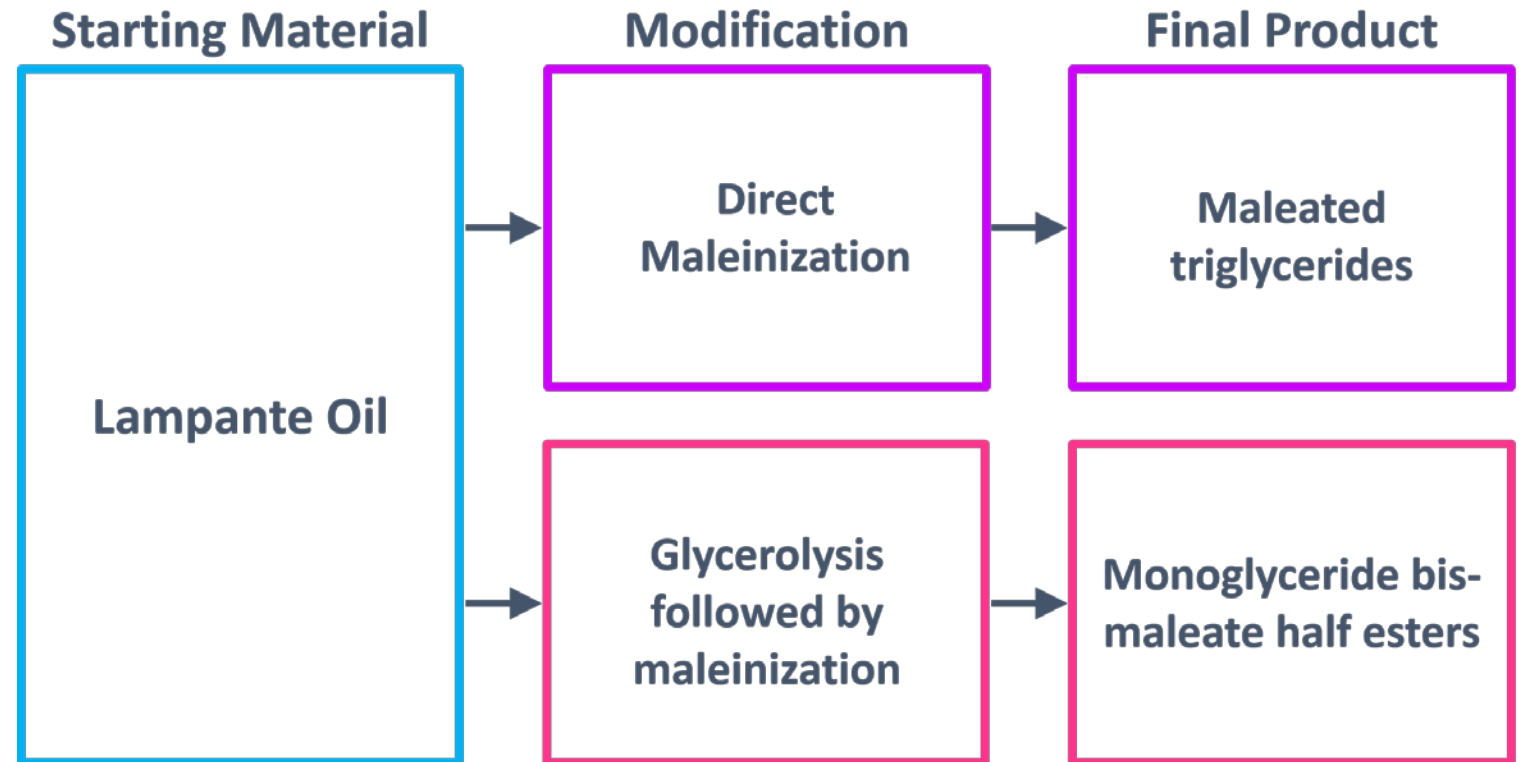
# Oil Modifications



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- Glycerolysis – Maleinisation
- Direct Maleinisation



# Oil Modifications



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Glycerolysis/Maleinisation



Direct Maleinisation

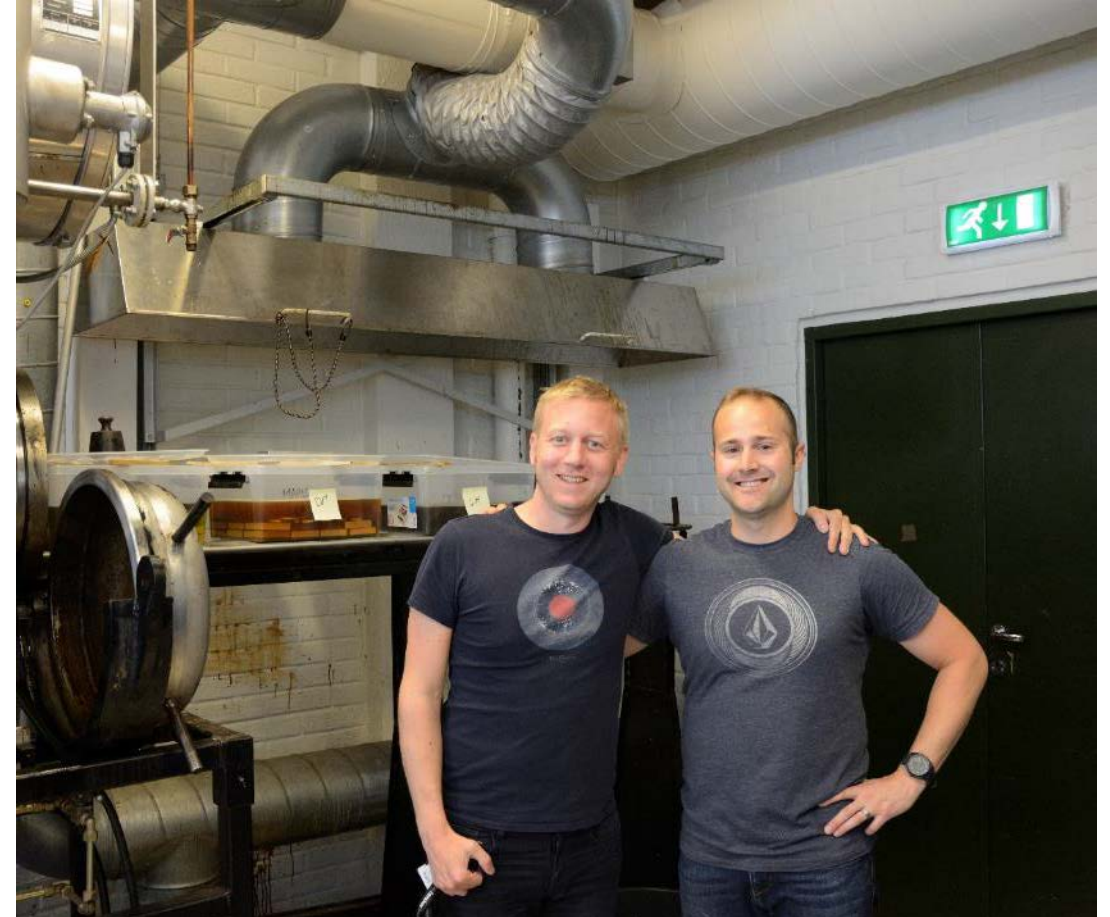
# STSM FP1407



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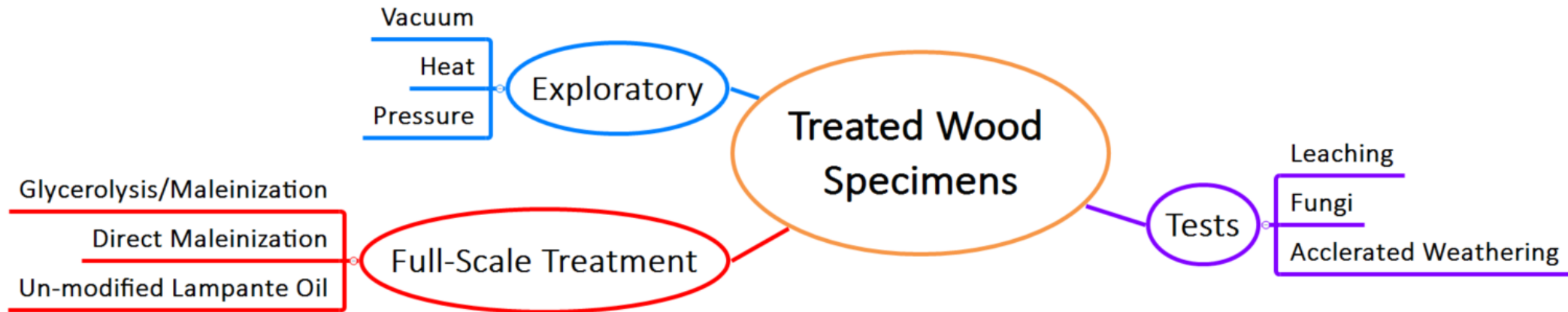
- Norwegian Institute for Bioeconomy Research
- June 6-10
- Dr. Andreas Treu
- Treatment of wood specimens with modified oils



# STSM FP1407



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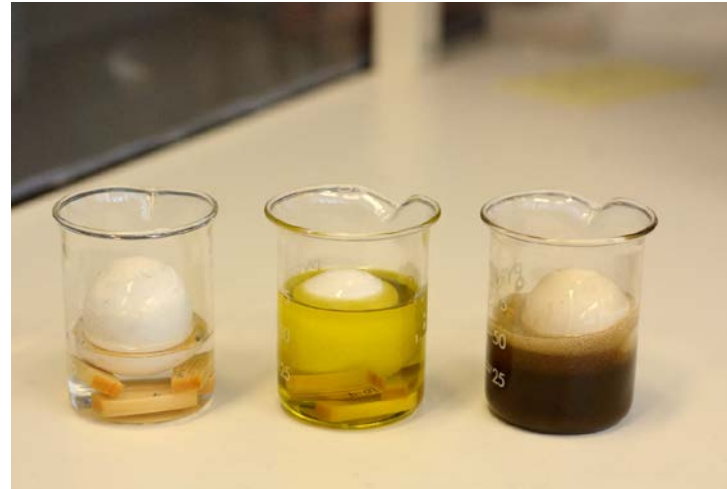
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- Pretrial 1
- 100 mbar vacuum
- 30 min
- Relative uptake
  - Water – 145 %
  - Lampante Oil – 61 %
  - GM Oil – 50 %



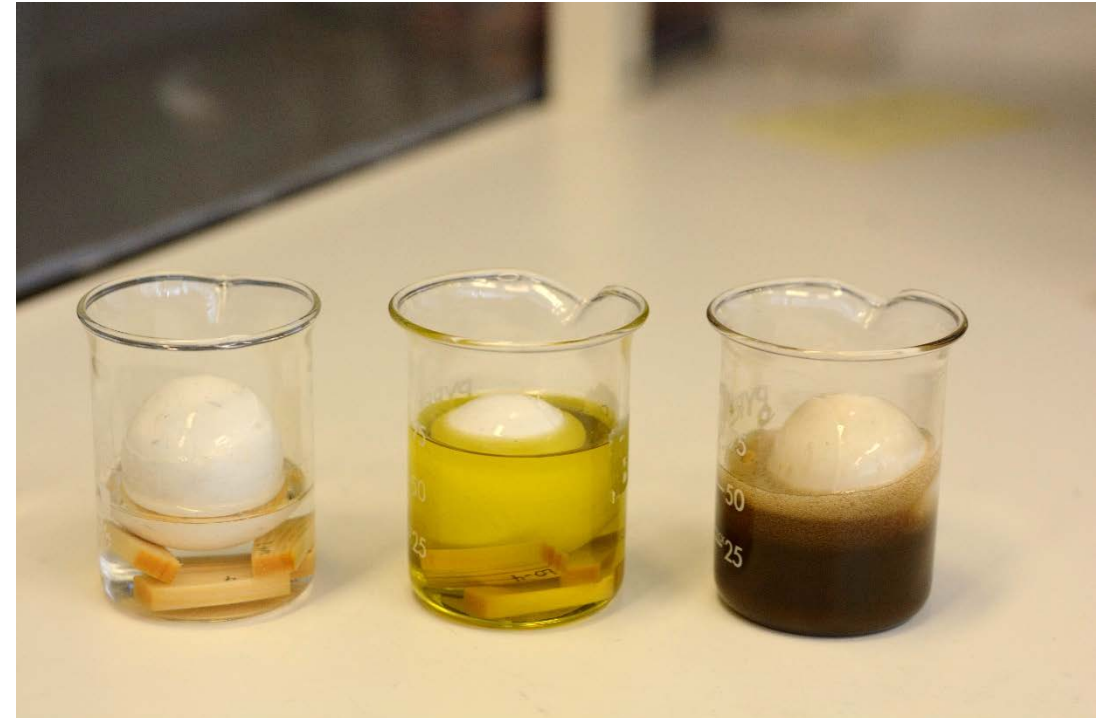
# STSM FP1407



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- Pretrial 2
- 100 mbar vacuum
- 30 min
- Heated to 40 °C
  
- Relative uptake
  - Water – 133 %
  - Lampante Oil – 55 %
  - GM Oil – 42%



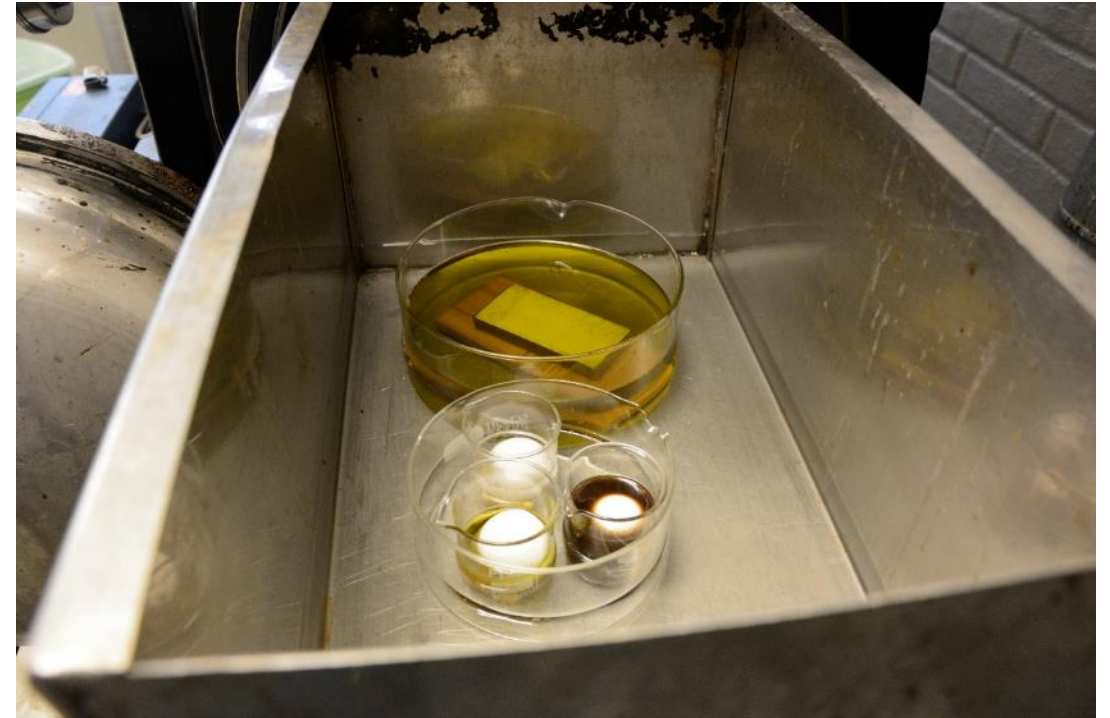
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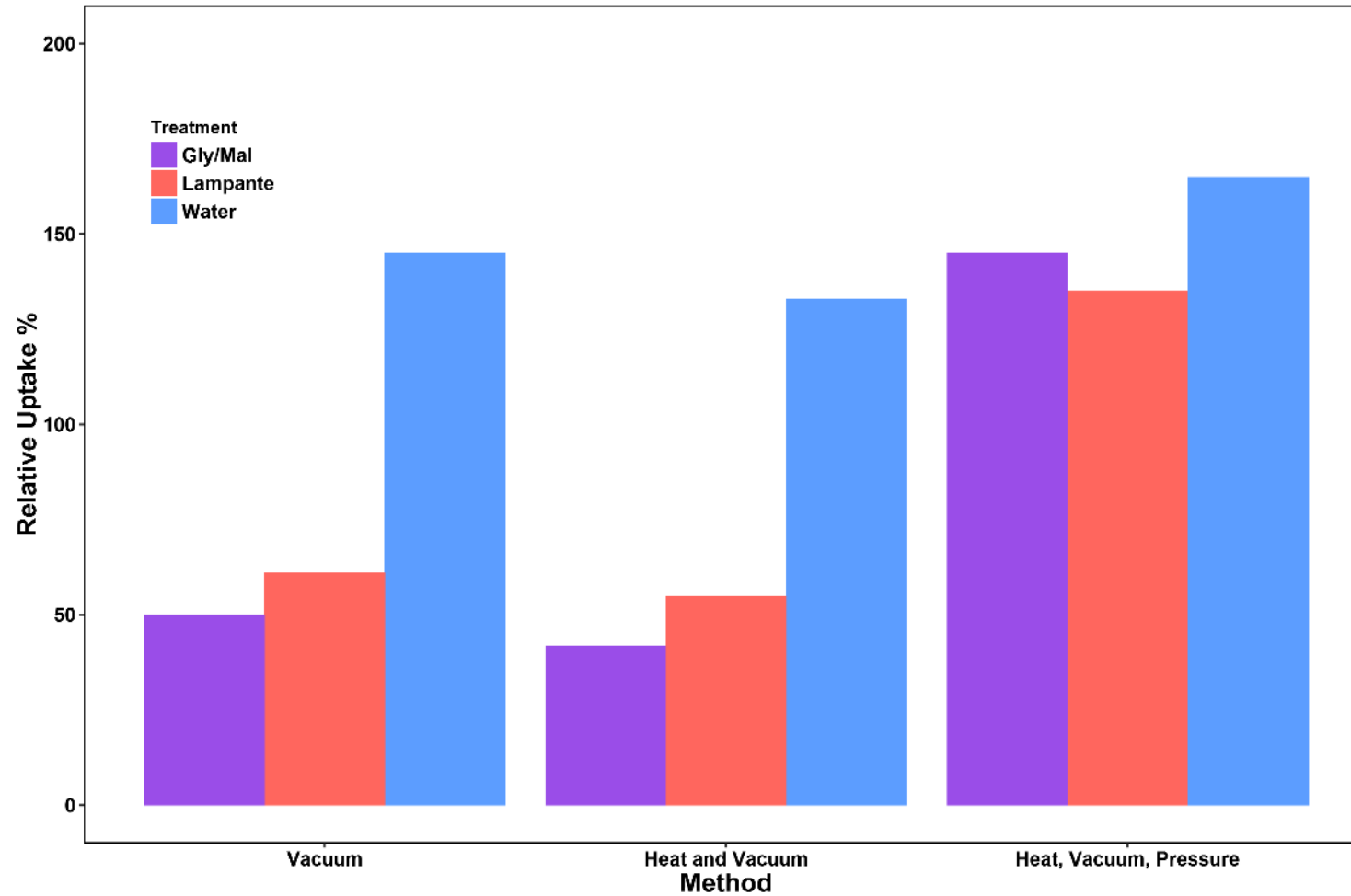
- Pretrial 3
- 100 mbar vacuum
- 1 hour
- Heated to 40 °C
- 7.8 bar for 2 hours
  
- Relative uptake
  - Water – 165 %
  - Lampante Oil – 135 %
  - GM Oil – 145%



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- Accelerated Weathering
- Leaching
- Mini block fungi tests



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- Full Scale Treatment
- Heated to 60 °C
- 0.04 mbar vacuum for 1 hour
- 7.8 bar for 2 hours

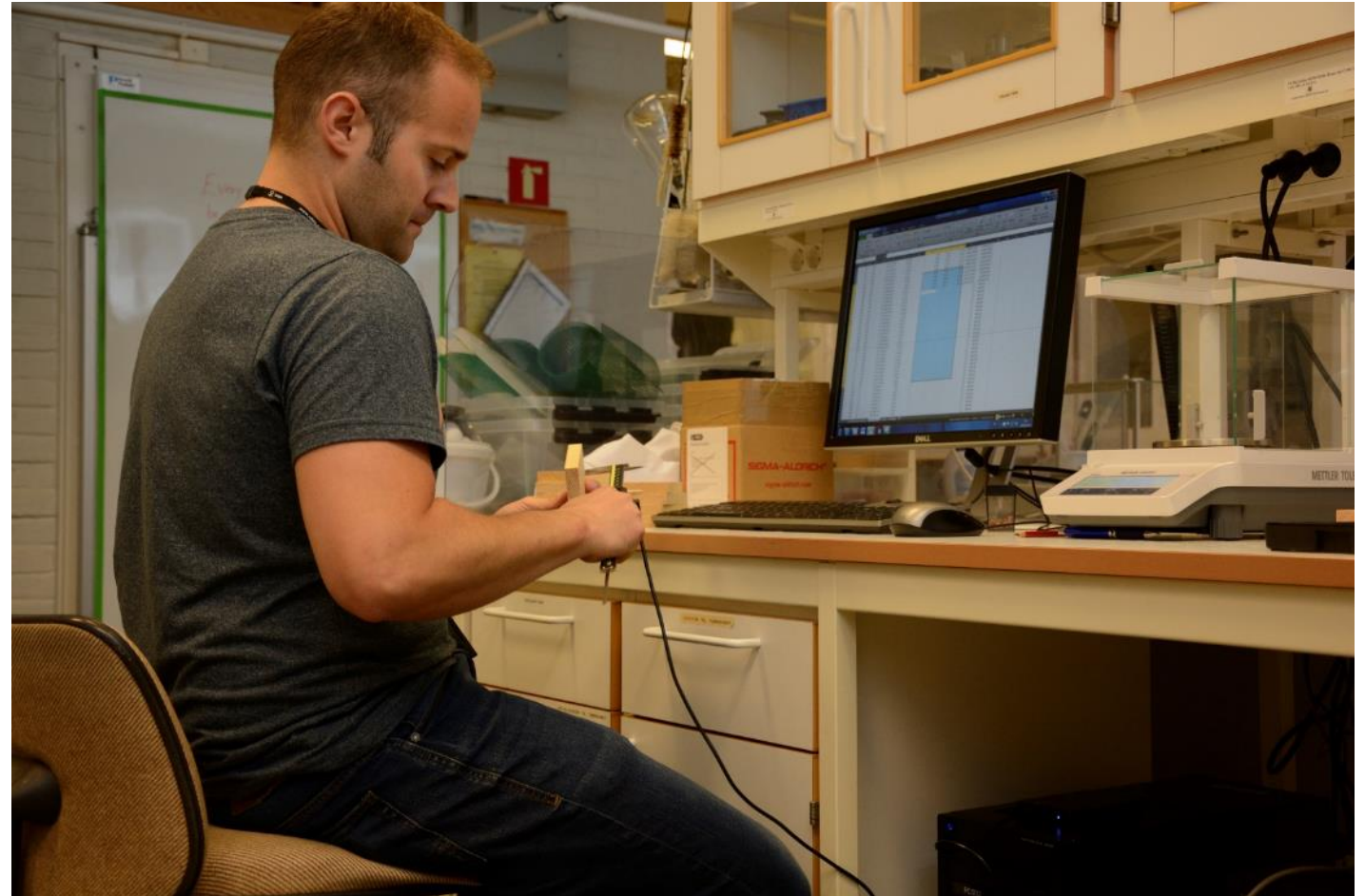


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- Specimens were wiped clean
- Measurement of dimensions and weight



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No  
Treatment

Un-modified  
Lampante Oil

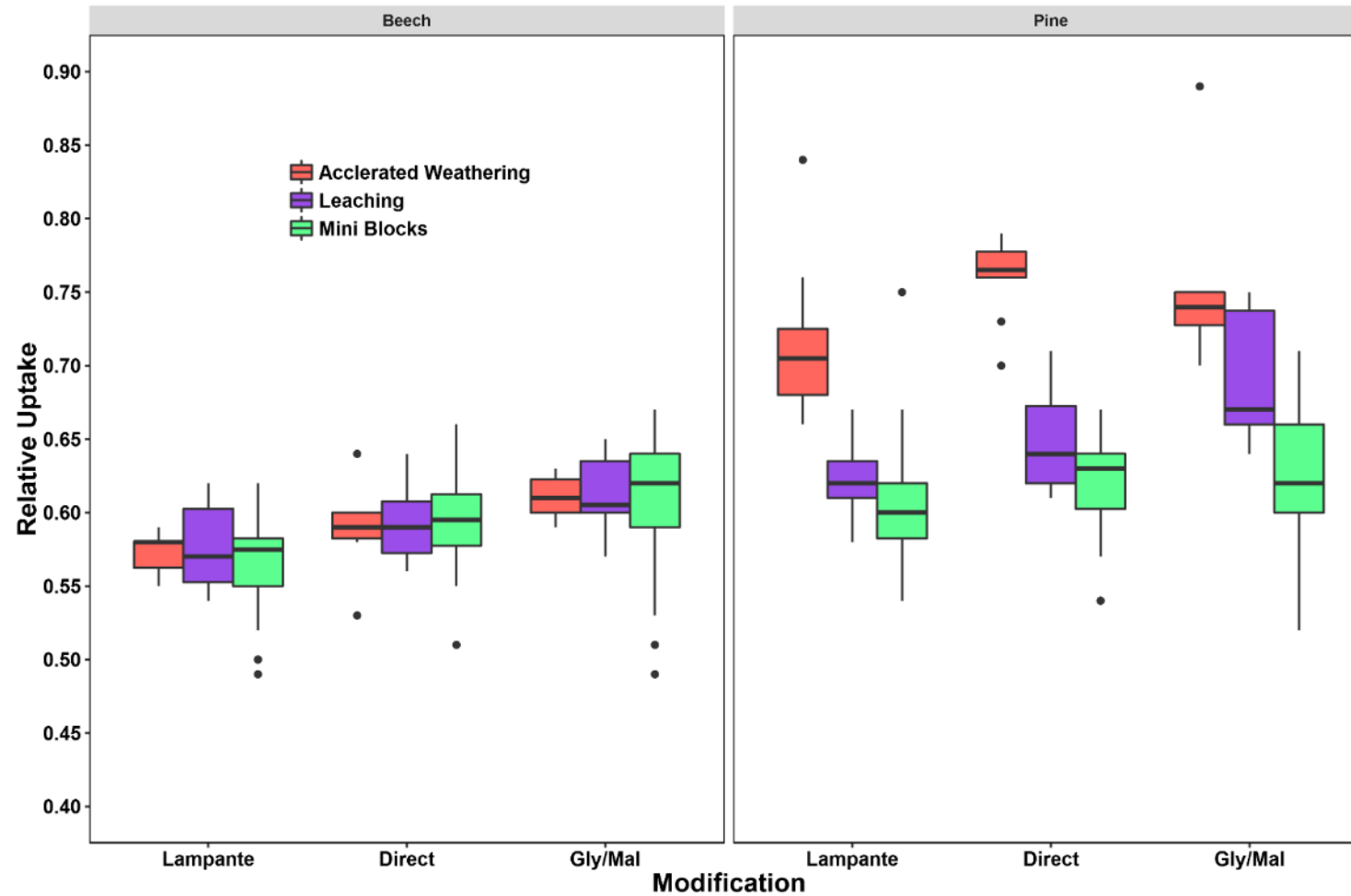
Direct  
Maleinisation

Glycerolysis/  
Maleinisation

# STSM FP1407



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# Ongoing Work

- Fungi tests at the University of Ljubljana
- Two exposure times of 8 and 16 weeks
  - 8 weeks complete as of Friday
- Beech
  - *Trametes versicolor*
  - *Pleurotus ostreatus*
- Pine
  - *Gloeophyllum trabeum*
  - *Poria monticola*
- Leaching and Accelerated Weathering



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# Acknowledgements



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