Life Sciences and Facility Management
Institute of Natural Resource Sciences

Identifying substrates for greywater treatment in a novel green wall system based on trickling filters

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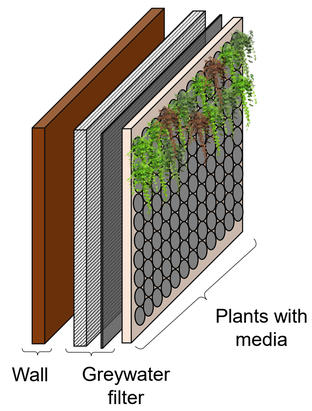
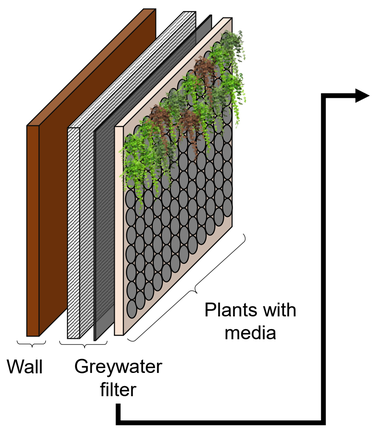
INTRODUCTION

- Urbanisation of population globally - 68% living in urban areas by 2050 - leads to even more sustainable water supply challenges
- Greywater treatment and re-use has high potential in urban environment to reduce pressure on water system
- Green walls as promising solution for on-site grey water treatment for water re-use and to address other challenges such as urban heat-island effect
- Novel green wall design proposed: trickling filter as back layer behind plant wall for greywater treatment



METHODS



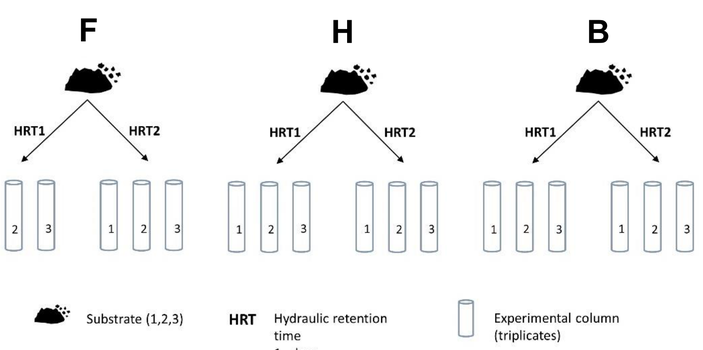
- Test of three substrates for greywater treatment performance
- Column test with re-circulation of artificial greywater

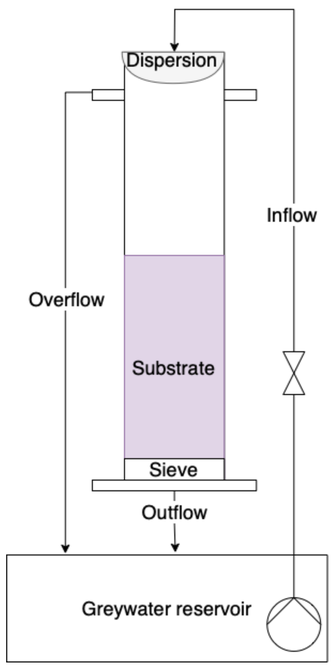

Hel-x carriers (**H**)


Expanded Shale (**B**)


Foam Carrier (**F**)

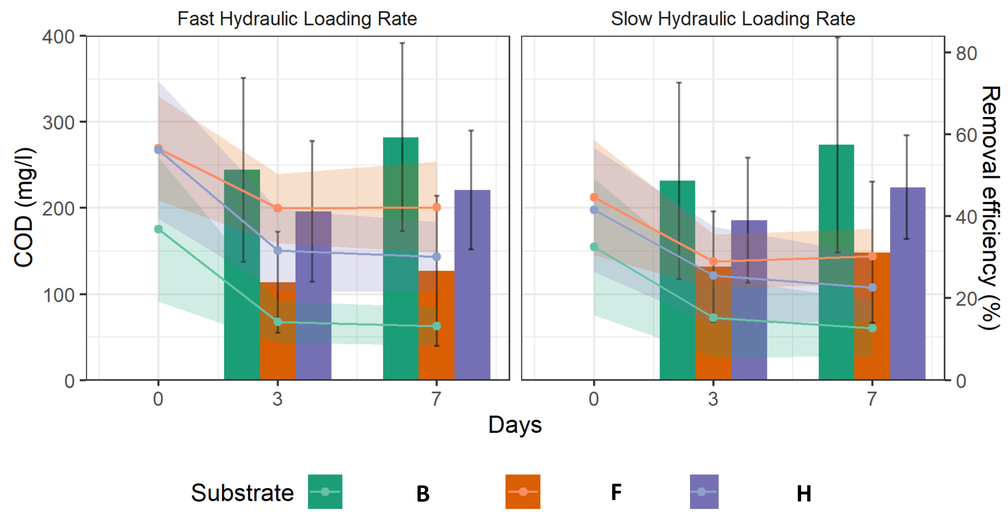
Experimental setup



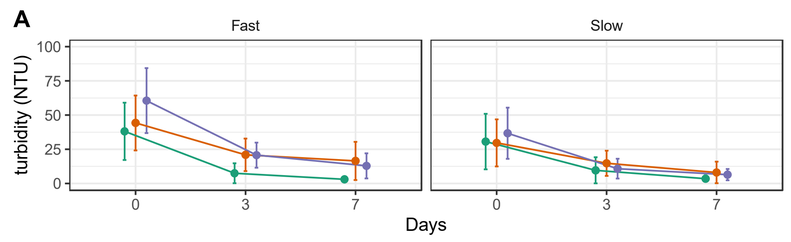


RESULTS

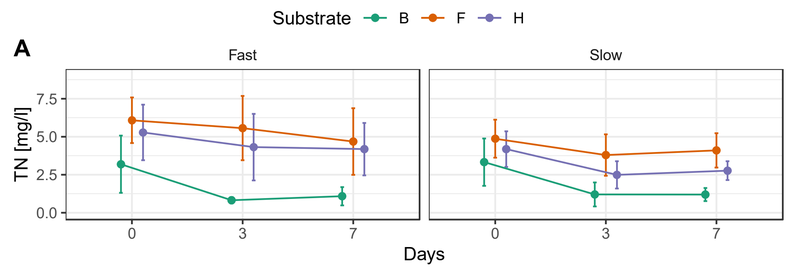
- Chemical Oxygen Demand (COD)



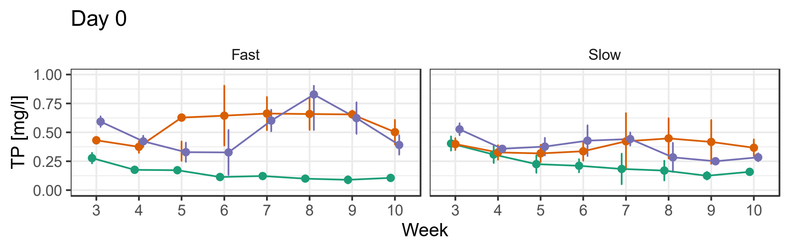
- Turbidity



- Total Nitrogen (TN)



- Total Phosphorus (TP)



CONCLUSIONS

- Expanded shale substrate consistently exhibited the highest removal (up to: 60% for COD, 85% for turbidity, 55% for TN, 40% for TP) across all examined parameters, followed by Hel-x carriers
- Slower Hydraulic Loading Rate (HLR; 8 L/m^2.h) for all substrates showed partially better treatment performance compared to the faster HLR (34 L/m^2.h), while still preventing excessive biofilm formation that could clog the trickling filter
- Hel-x will be considered for the use in a pilot installation of the novel green wall system, mainly due to its lower weight of the material compared to expanded shale

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