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Transforming water hyacinth waste into fertilizer

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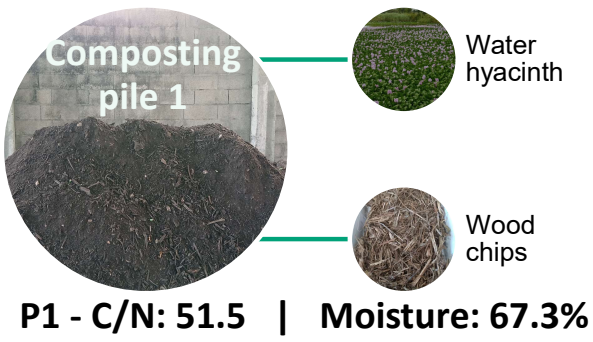
1. Introduction

- Water hyacinth *[Eichhornia crassipes* (Mart.) Solms] is one of the most worrying invasive alien species that blankets waterways, harming ecosystems and hindering navigation.
- However, its biomass concentrates a high level of nutrients that must be returned to the soil.

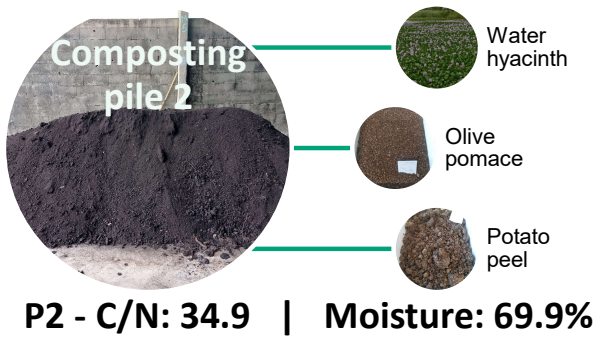
2. Objective

- Evaluate the **composting process** of water hyacinth waste with various by-products generated in the Center Region.
- Assess the **fertilizing effect** of the water hyacinth-based composts on **lettuce** crops.

3. Methods



P1 - C/N: 51.5 | Moisture: 67.3%



P2 - C/N: 34.9 | Moisture: 69.9%

4. Results

Composts' characterization

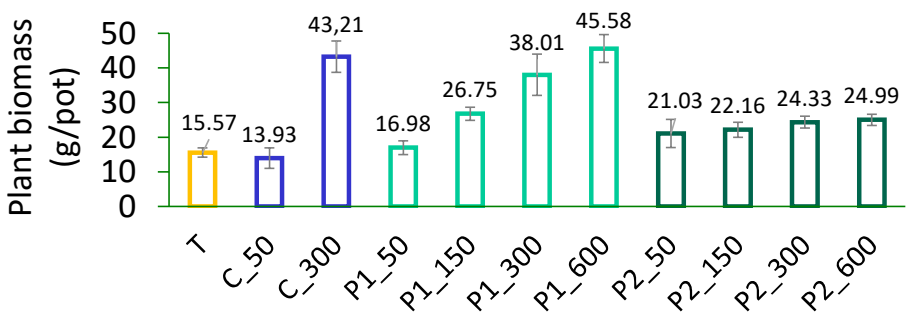
	pH	Moisture	OM	C	N	C/N ratio	P	K
		(%)					(%)	
P1	8.77	24.39	35	20	1.45	14	0.3	1.7
P2	8.87	29.07	73	42	3.43	12	0.3	2.4

	Cd	Cr	Cu	Ni	Pb	Zn	Hg
	(mg/kg)						
P1	0.21	13.67	21.75	13.27	11.91	123.89	0.042
P2	0.28	10.53	34.98	7.10	3.62	69.84	0.015
PL	0.70	100	100	50	100	200	0.70

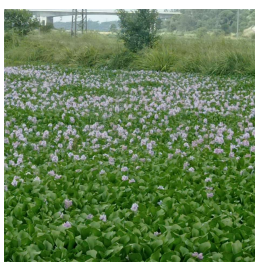
PL: Portuguese legislation for fertilizers application in agriculture (Portaria nº185/2022)

Greenhouse pot experiment

Fertilizing effect of composts



T: control (without fertilizer) | C: commercial compost | 50kg N/ha | 150kg N/ha | 300kg N/ha | 600kg N/ha



5. Conclusions

The potential of transforming water hyacinth waste into high-quality compost was demonstrated. This approach promotes a closed-loop system, converting a problematic weed into a valuable agricultural resource, offering environmental, economic and social advantages, and contributing to the circular economy.

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