RIGA TECHNICAL UNIVERSITY

WATER RESEARCH & BIOTECHNOLOGY

Quality of wastewater sludge compost: microbiological and micropollutant aspects

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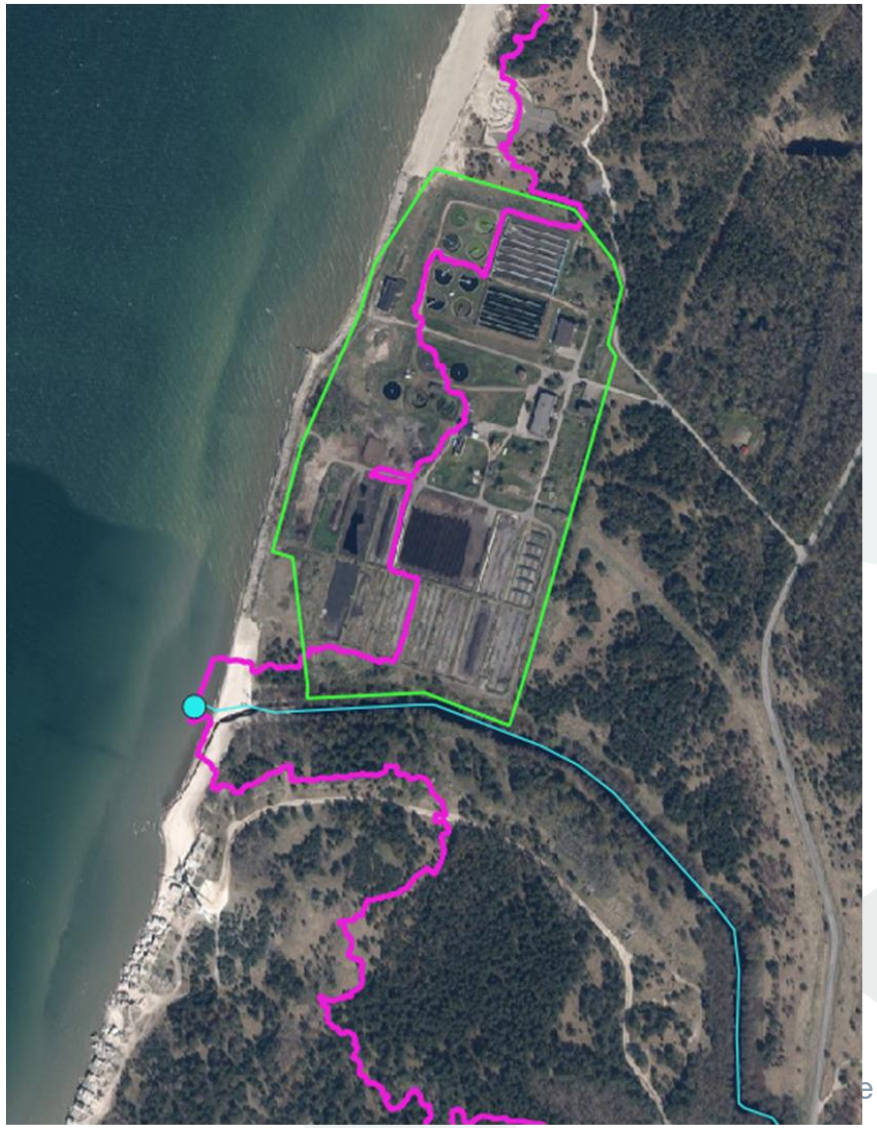
Ceraukste, 24.02.2026

History



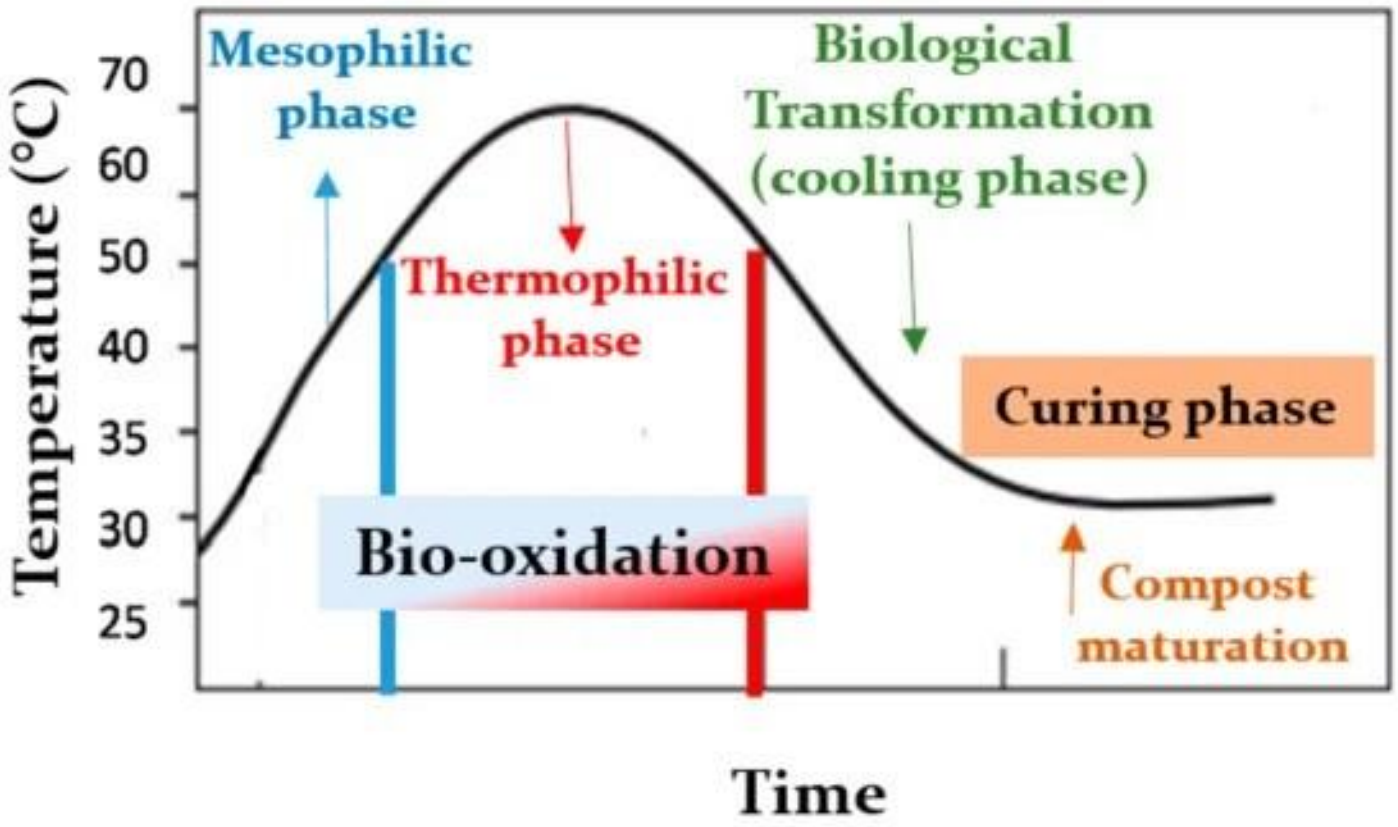
Objectives

- Assess the microbiological quality of sludge compost and bulking agents

- Sampling period – summer 2025

Key indices for compost quality

The stages of composting in relation to temperature



Rise Foundation, NGO

Optimal Process: 20–21 days for stability.

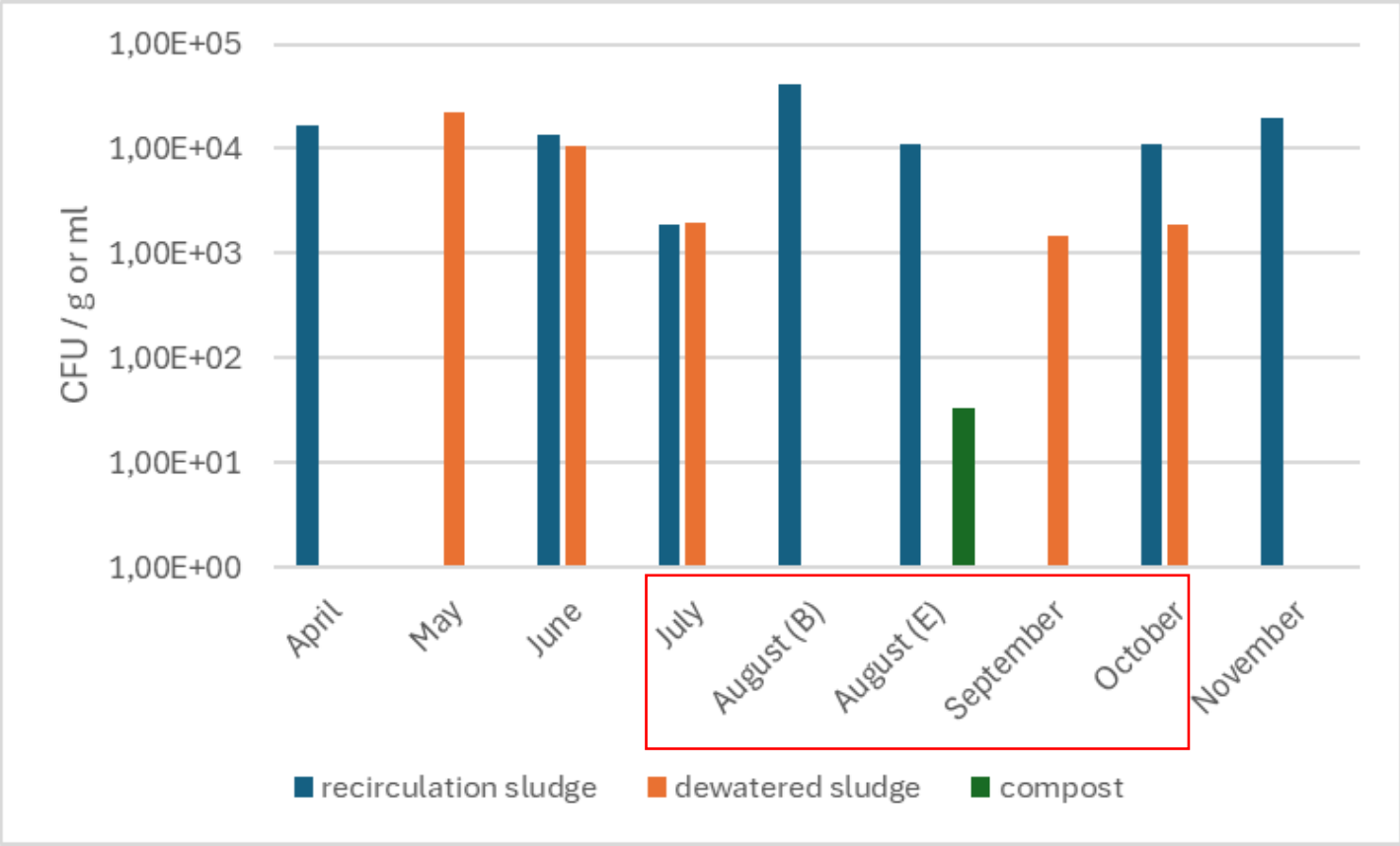
Full Maturation: 60–83 days for high-quality, fully matured compost.

Microbial indices*

Parameter	Counts
Escherichia coli	< 1000 CFU/g
Salmonella spp	Absent in 50 g (25g)
Helminth eggs	Count per g (kg)
Enterococcus	< 1000 CFU/g

*as agreed

Microbiological parameters: *Escherichia coli*



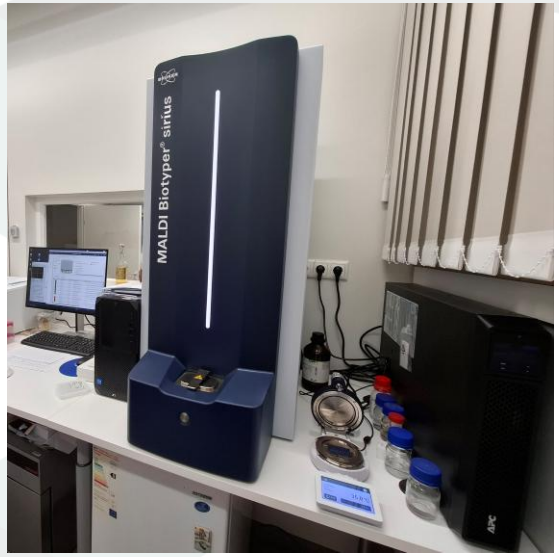
Bulking agents	*E. coli* CFU/g
Grains	0
Grass	$1{,}24*10^3$
Mix	$1{,}25*10^3$

Microbiological parameters: *Salmonella*, *Enterococcus* and helminths

- Salmonella confirmed for:
  - Bulking agent mix;
  - One of compost samples;
  - Sludge (recirculation and dewatered)

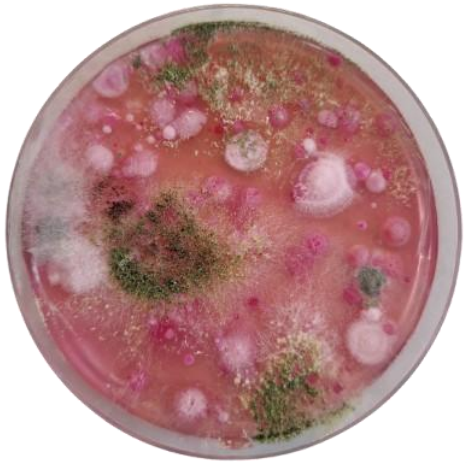
- Helminths confirmed for:
  - Sludge (dewatered)

- *Enterococcus*:
  - ~5*10^3 Sludge (dewatered)
  - Not present in compost

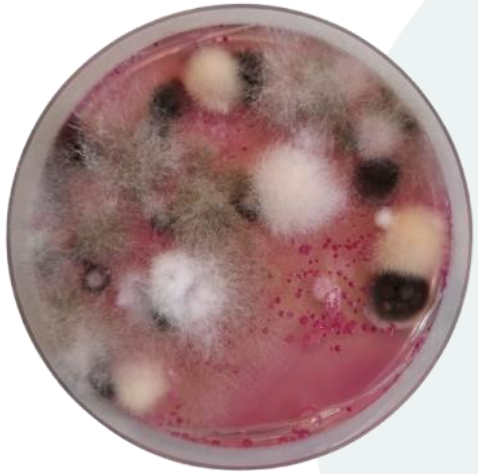


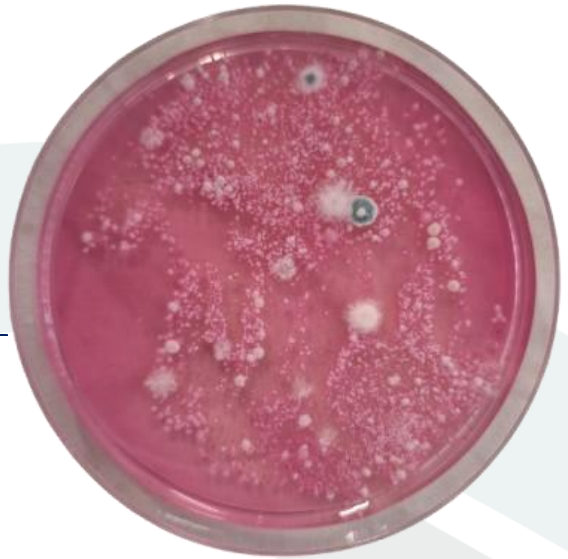
Microbiological parameters: fungi

Sludge



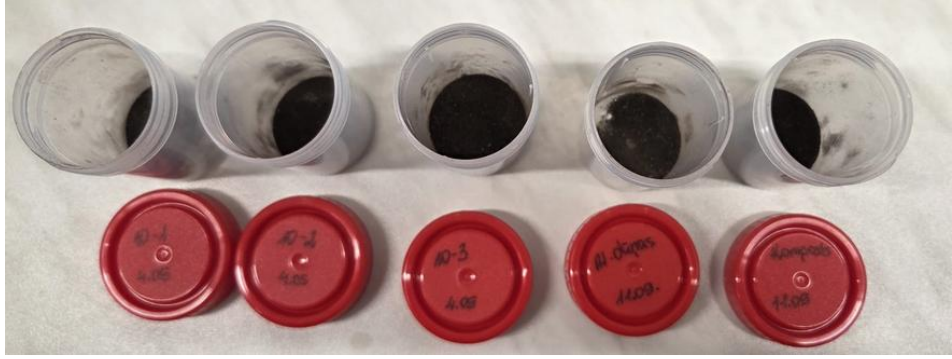
Bulking agent mix





Compost

Heavy metals



	Heavy metals, mg/kg					
	Cr	**Pb**	**Zn**	**Cd**	**Ni**	**Cu**
Compost N1	201,3	38,8	243,5	0,1	12,0	28,8
Compost N2	214,6	54,5	374,1	0,3	18,7	65,1
Compost N3	255,7	48,6	373,0	0,4	14,4	61,0
Compost N4*	65,3	11,3	83,0	0,4	3,1	21,1
Recirculation sludge*	252,6	37,3	658,7	0,8	17,1	144,4

Nr. p.k.	Klase*	Smago metālu masas koncentrācija sausnā (mg/kg)						
		Cd	Cr	Cu	Hg	Ni	Pb	Zn
1.	I	< 2,0	< 100	< 400	< 3,0	< 50	< 150	< 800
2.	II	2,1-5,0	101-250	401-500	3,1-5,0	51-100	151-250	801-1500

*sampled at the same time
Limits based on Cabinet of Ministers No. 263

Conclusions:

- In general the quality of the compost can be regarded as very good.
- The required reduction of pathogens (originating from both sludge and bulking agents) is achieved.
- Composting ensured the decrease of moulds, at the same time retaining high microbiological activity.
- Composting did not facilitate heavy metal accumulation.

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