Chemical characteristics of biosolids composted with eucalyptus bark

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Introduction

- Biosolids contain organic matter and nutrients and can be applied in agricultural and forestry lands as an organic fertilizer.
- To be used, biosolids must respect the tolerance limits for pathogens indicators.
- Composting with biosolids and a carbon source cause elevation of temperature whose principle is the transformation of organic matter by aerobic microorganisms.
- In the thermophilic phase of composting, the temperature of the compost mass increases to the range of 40 to 70 °C, which, in addition to the degradation and stabilization of organic matter, reduces and eliminates pathogens.

Objective

Evaluate the use of eucalyptus bark as a carbon source in the composting process with two different type of biosolids: one from Upflow Anaerobic Sludge Blanked Digestion (UASB) and other from a prolonged aeration activation process.

Material and Methods

- Two different biosolids:
  1) Upflow Anaerobic Sludge Blanked Digestion (UASB);
  2) Prolonged aeration activation process.
- Carbon source: eucalyptus bark.
- Volumetric ratio: 1:1 (biosolid : eucalyptus bark)
- Period of composting process: 45 days.
- 1 pile of 27 m x 3 m x 1.5 m (60 m^3) for each biosolid.
- 3 replicates (20 m^3 each).
- Chemical analysis: at the final of composting process.
- Sampling: 6 random points in different depths in each of the 3 replicates.





Results

	N	P_2O_5	K_2O	Ca	Mg	S	Um	MO	C	Na	B	Cu	Fe	Mn	Zn	C/N	pH
	.....% in natura.....									.....mg/kg in natura.....						..in natura..	
Biosolid 1 x eucalyptus bark	1.8	1.6	0.1	1.0	0.2	1.6	25.2	43	24	550	134	42	18165	219	245	13	5.5
Biosolid 2 x eucalyptus bark	1.8	0.8	0.2	1.4	0.3	0.5	11.2	57	32	694	69	52	11370	204	135	18	5.7

Conclusions

- At the end of the composting process, both biosolids mixture with eucalyptus bark presented favorable chemical characteristics for the use of the compost obtained as an organic fertilizer: C/N less than 20, moisture less than 30% and pH near of neutrality.
- In addition, the macronutrient and micronutrient contents present in the compost prove the potential of the material for fertility purposes.

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