

## Supplementary Material

Data obtained through acid-base titrations following the methodology proposed by López et al. (2021) [16].

**Table S1:** Abundance of deprotonated groups at pH 7.0 ( $Q_{pH7.0}$ ) and the abundance of acid sites of the extracts HA, FA and DOM ( $M_T$ ,  $M_{T,HS}$  and  $M_{T,DOM}$ ). The abundance of acid sites of the extracts was calculated using Equations S3 and S4.

Parameters			CVA*	CVDW*	CA	CLW*	CUW*	CDDW*	CSS*	FLW
HA	$Q_{pH7.0}$	(mmol g <sup>-1</sup> )	4.18	4.53	4.92	4.23	5.39	5.43	3.57	3.74
	$M_T$	(mmol g <sup>-1</sup> )	6.65	7.13	8.28	7.14	8.95	8.73	6.32	5.68
	$M_{T,HS}$	(mol kg <sub>compost</sub> <sup>-1</sup> )	0.12	0.1	0.09	0.14	0.1	0.08	0.09	0.18
FA	$Q_{pH7.0}$	(mmol g <sup>-1</sup> )	8.10	10.2	10.9	8.46	9.12	9.41	11.0	7.09
	$M_T$	(mmol g <sup>-1</sup> )	11.3	14.1	16.6	12.9	12.5	13.7	18.5	10.6
	$M_{T,HS}$	(mol kg <sub>compost</sub> <sup>-1</sup> )	0.01	0.03	0.02	0.03	0.02	0.02	0.04	0.04
DOM	$Q_{pH7.0}$	(mmol g <sup>-1</sup> )	4.59	2.18	3.31	2.36	1.85	5.65	2.84	2.55
	$M_T$	(mmol g <sup>-1</sup> )	9.89	4.32	6.7	5.63	3.92	11.3	8.38	5.92
	$M_{T,DOM}$	(mol kg <sub>compost</sub> <sup>-1</sup> )	0.22	0.62	0.10	0.97	0.43	0.26	1.17	1.09

\* Data from López et al. (2021) [16]

The carbon content of each extract  $C_{HS}$  and  $C_{DOM}$  were calculated using equations (S1) and (S2), for the HS and DOM, respectively:

$$C_{HS} = \frac{C}{100} \times Y \quad (S1)$$

$$C_{DOM} = \frac{DOC}{\frac{m_{compost}}{V}} \quad (S2)$$

where,  $C$  is the carbon content of the HS (% w/w),  $Y$  is the yield of the extractions (w/w, g kg<sup>-1</sup>),  $DOC$  is the concentration of dissolved organic carbon (mg L<sup>-1</sup>) and  $m_{compost}/V$  is the mass of compost per volume of solution used to prepared the equilibrium solution (50 g<sub>compost</sub> L<sup>-1</sup>).

**Table S2:** Carbon content of the extracts HA, FA and DOM and yield ( $Y$ ) of the extractions of HA and FA. The carbon content of each extract was calculated using Equations S1 and S2.

Sample	HA			FA			DOM	
	C (%)	Y (g kg <sup>-1</sup> )	$C_{HA}$ (gC kg <sub>compost</sub> <sup>-1</sup> )	C (%)	Y (g kg <sup>-1</sup> )	$C_{FA}$ (gC kg <sub>compost</sub> <sup>-1</sup> )	DOC (mg L <sup>-1</sup> )	$C_{DOM}$ (gC kg <sub>compost</sub> <sup>-1</sup> )
CVA	53.5*	33.4*	17.9	49.7*	2.27*	1.14	111*	2.22
CVDW	52.7*	19.0*	13.9	39.8*	4.73*	1.87	717*	14.3
CA	53.3	19.9*	10.6	45.8*	2.67*	1.22	75.2*	1.5

<b>CLW</b>	55.2*	34.9*	19.3	35.4*	7.00*	2.48	861*	17.2
<b>CUW</b>	54.5*	21.1*	11.5	40.8*	3.33*	1.35	548*	11
<b>CDDW</b>	50.6*	26.4*	9.62	38.4*	4.20*	1.61	115*	2.31
<b>CSS</b>	58.5*	23.8*	13.9	40.9*	4.84*	1.97	698*	14
<b>FLW</b>	57.5	53.6	30.9	36.9*	10.9*	4.02	921*	18.4

\* Data from López et al. (2021) [16]

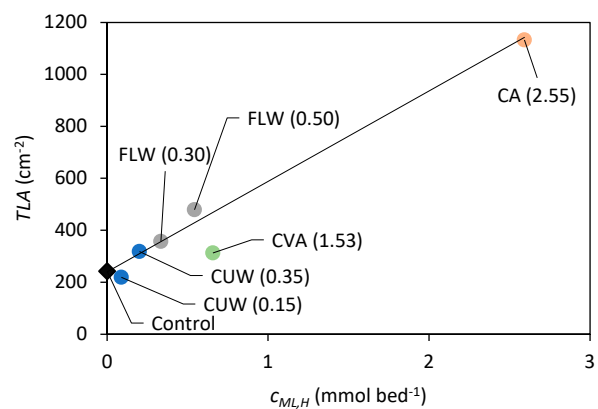
The abundance of the acid sites,  $M_{T,HS}$  and  $M_{T,DOM}$  (expressed in mol kg<sub>compost</sub><sup>-1</sup>) were calculated attending to the values of  $M_T$  from each extract (Table S2, expressed in mmol g<sup>-1</sup>) and to  $C_{HS}$  or  $C_{DOM}$  (Table S3, expressed in gC kg<sub>compost</sub><sup>-1</sup>), using equations (S3) and (S4).

$$M_{T,HS} = M_T \times C_{HS} \quad (S3)$$

$$M_{T,DOM} = M_T \times C_{DOM} \quad (S4)$$

**Table S3:** Identification of the compost and fertiliser samples characterized in the present work.

SAMPLE	COMPOSTING METHODOLOGY	RAW MATERIAL
Compost of urban waste ( <b>CUW</b> )	Tunnel composting	Selective collection of household food waste, food waste from restaurants, canteen, markets, fairs, festivities, pilgrimages and events, green waste from cemetery and household
Vermicompost of algae ( <b>CVA</b> )	Vermicomposting	60% animal waste and 40% vegetable remains (fruits and algae), digested by <i>Eisenia foetida</i> earthworms.
Vermicompost of domestic waste ( <b>CVDW</b> )		Green waste (flowers, leaves, grass, fruit peels) and brown waste (straw, dry leaves, dry grass), digested by <i>Eisenia foetida</i> or <i>Lumbricus rubellus</i> earthworms.
Compost of livestock waste ( <b>CLW</b> )	Pile composting	100% animal waste (a mixture of 5% sheep manure without straw, 25% chicken manure and 70% pig manure)
Compost of algae ( <b>CA</b> )		60% animal waste and 40% vegetable remains (fruits and algae).
Compost of sewage sludge ( <b>CSS</b> )		Forestry waste, sludge from urban wastewater treatment and sludge from local effluent treatment.
Domestic compost of domestic waste ( <b>CDDW</b> )	Domestic Composting	Green waste (flowers, leaves, grass, fruit peels) and brown waste (straw, dried leaves, dried grass).
<b>ORGANIC FERTILISER</b>		
Fertiliser of livestock waste ( <b>FLW</b> )	-	100% animal waste (chicken manure). Mixture subjected to a high temperature to eliminate pathogens.



**Figure S1:** Correlation between the total leaf area ( $TLA$ ) of lettuce from a crop field assay and the parameters  $c_{ML,H}$  ( $0.30 \mu\text{mol L}^{-1}$ ) obtained from metal titrations of the HA extracts.

**Table S4:** Data from C/N molecular ratio of the compost and fertiliser samples. Adapted from [3]

CVA	CVDW	CA	CLW	CUW	CDDW	CSS	FLW
12.5	9.2	9.97	12.8	12.6	10.3	8.6	13.2