Insights on molecular characteristics of hydrochars by ^{13}C NMR and Off-line TMAH-GC/MS and assessment of their potential use as plant growth promoters

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Figure S1. Effect of hydrochar soluble fraction concentration (C_0 = 0 mg C L^{-1}, C_1 = 1 mg C L^{-1}, C_{10} = 10 mg C L^{-1}, C_{50} = 50 mg C L^{-1}, C_{100} = 100 mg C L^{-1}) on germination percentage of maize seeds during 7 days.

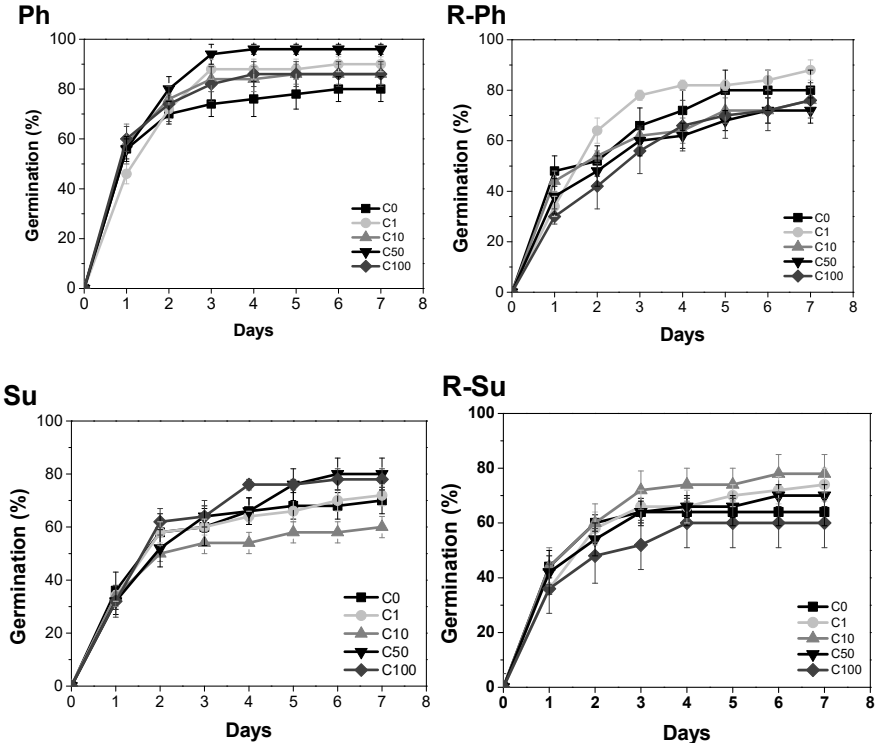

Table S1. Compounds released by thermochemolysis- GC/MS of hydrochars, with a relative area percentage ≥ 0.50%, the retention time (RT) recorded and the degree of matching/probability (P) in percentage for each compound.

		HYDROCHAR							
RT	**COMPOUND**	**Ph**		**R-Ph**		**Su**		**R-Su**	
			P (%)		**P (%)**		**P (%)**		**P (%)**
5.34	Benzene,1-methoxy-4-methyl	X	91.9	X	91.2	X	78.9		
5.36	2-butenedioic acid (E)-,dimethyl ester							X	85.1
5.48	butanedioic acid, dimethyl ester	X	93.5	X	94.7	X	93.1	X	86.3
5.81	2',6'-dihydroxy-3'-methylacetophenone					X	80.2	X	79.2
5.97	phenol 2-methyl	X	93.5	X	91.2	X	90.2		
6.06	butanedioic acid, methyl-,dimehtyl ester	X	81.9	X	83.0	X	80.5		
6.19	Benzenamine,2-methoxy-	X	88.1	X	88.0				
6.37	phenol,4-methyl-	X	92.4	X	91.7	X	91.9		
6.40	phenol, 3-propyl-					X	82.8		
6.54	mequinol	X	90.3	X	89.8				
6.64	butanedioic acid, methylene-, dimethyl ester					X	82.6		
6.72	benzoic acid, methyl ester			X	82.7	X	69.7	X	81.7
6.95	methyl-2-thiophene carboxylate							X	86.8
6.96	dimethyl ethylidenemalonate					X	75.2		
7.06	2-thiophenecarboxylic acid hydrrazide							X	82.5
7.07	benzene,1-ethyl-4-methoxy	X	93.5	X	94.7	X	93.4		
7.47	pentanedioic acid, dimehtyl ester	X	78.8	X	78.7			X	75.5
7.68	benzene, 1,2-dimethoxy-	X	85.7	X	86.0				
7.80	silane, triethyl(4-methylphenoxy)-							X	85.2
7.88	phenol,2,4-dimethyl-					X	88.7	X	89.1
7.94	benzene,1-ethenyl-4-CH3O	X	92.5	X	93.6	X	92.4		
8.15	benzene, 1,4-dimethoxy-	X	89.5	X	87.2				
8.47	phenol,2-methoxy-3-methyl			X	76.4				
8.80	phenol,4-methoxy-3-methyl			X	79.0				
9.16	benzenepropanoic acid,2-methoxy-,methyl ester					X	70.0		
9.22	benzoic acid,3-methyl-,methyl ester							X	89.8
9.37	2-thiophenecarboxylic acid, 5-methyl-,methyl ester							X	90.3
9.68	2-thiophenecarboxylic acid, 5-methyl-,methyl ester							X	86.6
9.89	2,6-dimethoxytoluene	X	92.5						
10.15	phenol,2-methyl-6-(2-propenyl)-			X	80.2				
10.54	benzaldehyde,4-methoxy-			X	81.4			X	87.9
10.87	benzene,1-methoxy-4-(1-methylpropyl)-							X	77.7
10.94	2,6-dimethoxytoluene			X	71.7				
11.18	benzoic acid,2,3-dimethyl-,methyl ester							X	92.3
11.79	1,2,3-trimethoxybenzene	X	93.9	X	94.1				
12.10	2,5-dimethoxyethylbenzene	X	89.5	X	90.1				
12.36	benzene,1-methoxy-4-(methylthio)-							X	89.6
12.60	benzoic acid,4-methoxy-,methyl ester	X	90.7						
12.64	benzoic acid,3-methoxy-,methyl ester			X	94.3	X	93.5	X	92.7

12.91	phenol,2,6-dimethoxy	X	90.2	X	86.3				
13.10	acetophenone,4'-methoxy-	X	91.5	X	91.6				
13.37	1,2,4-trimethoxybenzene	X	89.7	X	94.1				
13.48	Benzene-4-ethenyl-1,2-dimethoxy-	X	84.6	X	92.5				
13.50	4-(para-totyl)-butyric acid							X	85.6
13.66	benzoic acid,4-methoxy-,methyl ester	X	93.4	X	93.9				
14.29	benzene,1,2,3-trimethoxy-5-methyl	X	91.5	X	92.9				
14.64	trimethyl 1,2,3-propanetricarboxylate	X	88.3	X	86.6	X	90.1	X	89.9
15.18	benzoic acid, 2-methoxy-, methyl ester							X	80.6
15.63	1,3-benzodioxole-5-carboxylic acid, methyl ester							X	75.1
15.72	dimethyl phthalate			X	73.8				
16.12	3-(2-methoxy-5-methylphenyl)propanoic acid	X	82.0	X	80.9				
16.61	2,3-thiophenedicarboxylic acid, dimehtyl ester							X	86.3
17.08	benzenebutanoic acid,2,5-dimethyl-							X	81.6
17.18	1,4-benzenedicarboxylic acid,dimethyl ester							X	91.3
17.48	cis-2-(3,4-Di-CH3O phenyl)-1-CH3O ethylene	X	-	X	-				
17.60	dimethyl 2,5-thiophenedicarboxylate							X	85.3
17.85	C12 FAME					X	80.1	X	69.2
17.97	benzenepropanoic acid,4-methoxy-,methyl ester	X	92.5	X	93.4				
18.48	C11-OCH3			X	-				
18.52	nonanedioic acid, dimethyl ester							X	87.6
18.98	ethanone,1-(3,4-dimethoxyphenyl)-	X	83.8	X	82.7				
19.72	benzoic acid, 3,4-dimethoxy-, methyl ester	X	94.6	X	94.6			X	84.8
20.60	1,2-benzenedicarboxylic acid,4-methyl-,dimethyl ester							X	83.3
21.30	sebacic acid monomethyl ester							X	86.0
22.02	2-propenoic acid,3-(4-methoxyphenyl)-,methyl ester, (E)-	X	86.9	X	88.4				
23.14	3,4,5-Tri-CH3O benzoic acid ME	X	70.0	X	97.5				
23.38	C14 FAME					X	84.0		
25.26	C15 anteiso FAME							X	-
25.41	C18 alkane			X	64.7				
26.00	C15 FAME					X	86.6		
28.52	C16 FAME			X	82.8	X	82.2	X	71.5
30.66	5-methoxy-2-methyl-4-oxo-1,2,3,4-tetrahydro-1,10,phenantthrolin			X	74.6				
30.94	C17 FAME					X	80.8		
32.78	C18:1 FAME					X			
33.24	C18 FAME	X	76.1	X	74.5	X	80.1	X	75.2
33.50	nonanoic acid, 9-(O-propylphenyl)-,methyl ester					X	74.9		
36.00	hexadecanedioic acid, dimethyl ester							X	69.6
37.25	octadecanoic acid, 4-hydroxy-,methyl ester					X	82.1		
37.59	C20 FAME	X	80.4	X	80.4	X	82.8		
41.57	1,2-benzenedicarboxylic acid, mono(2-ethylehyl) ester	X	85.9						
42.97	C26 alkane					X	65.8		
43.52	tricosanoic acid, methyl ester					X	85.9	X	83.1
44.48	esterol					X	60.8		

44.80	C27 Alkane			X	-	X	-	X	-
45.34	C24 FAME	X	83.2	X	76.7	X	79.7	X	79.3
45.45	1,3-benzenedicarboxylic acid,bis(2-ethylhenyl) ester			X	85.3	X	83.5	X	87.3
46.51	C26:1 FAME	X	-	X	-	X	-		
46.59	C28 alkane	X	-	X	77.9				
47.10	C26-OCH3	X				X	-	X	-
47.36	C24, 2-CH3O, FAME					X	-		
48.31	C28 alkane							X	79.6
48.82	C26 FAME	X	90.2			X	90.2	X	79.3
49.95	C30 alkane			X	81.0				
49.31	C24,24-CH3O, FAME					X	-		
50.49	C28-CH3O	X	-	X	-			X	-
51.58	Alkane					X	-		
52.12	C28 FAME	X	85.7	X	85.7	X	86.5	X	86.4
53.13	C32 alkane			X	79.4				
53.62	C30-CH3O	X	-			X	-	X	-
55.18	C30 FAME	X	84.3	X	83.8	X	83.9	X	70.2

FAME=fatty acid methyl ester; ME= Methyl ester; CH3O = methoxy, (-) The attribution was made based in the main peaks identified.

Table S2. Germination index of maize seeds calculated for each concentration of hydrochar soluble fraction for Ph, R-Ph, Su and R-Su samples.

Germination Index (GI)

Ph		**R-Ph**		**Su**		**R-Su**	
r= 0.83		**r= -0.97**		**r= 0.27**		**r= 0.43**	
C0	6.5±0.4	C0	5.8±0.6	C0	5.0±0.6	C0	5.3±0.4
C1	6.5±0.2	C1	5.6±0.3	C1	4.9±0.1	C1	5.1±0.3
C10	7.0±0.6	C10	5.4±0.3	C10	4.4±0.2	C10	5.7±0.6
C50	7.4±0.3	C50	4.9±0.6	C50	5.1±0.5	C50	5.4±0.5
C100	7.2±0.5	C100	4.5±0.5	C100	5.1±0.4	C100	4.5±0.7

*r=correlation coefficient