

Recycling of spent coffee grounds for useful extracts and green composites

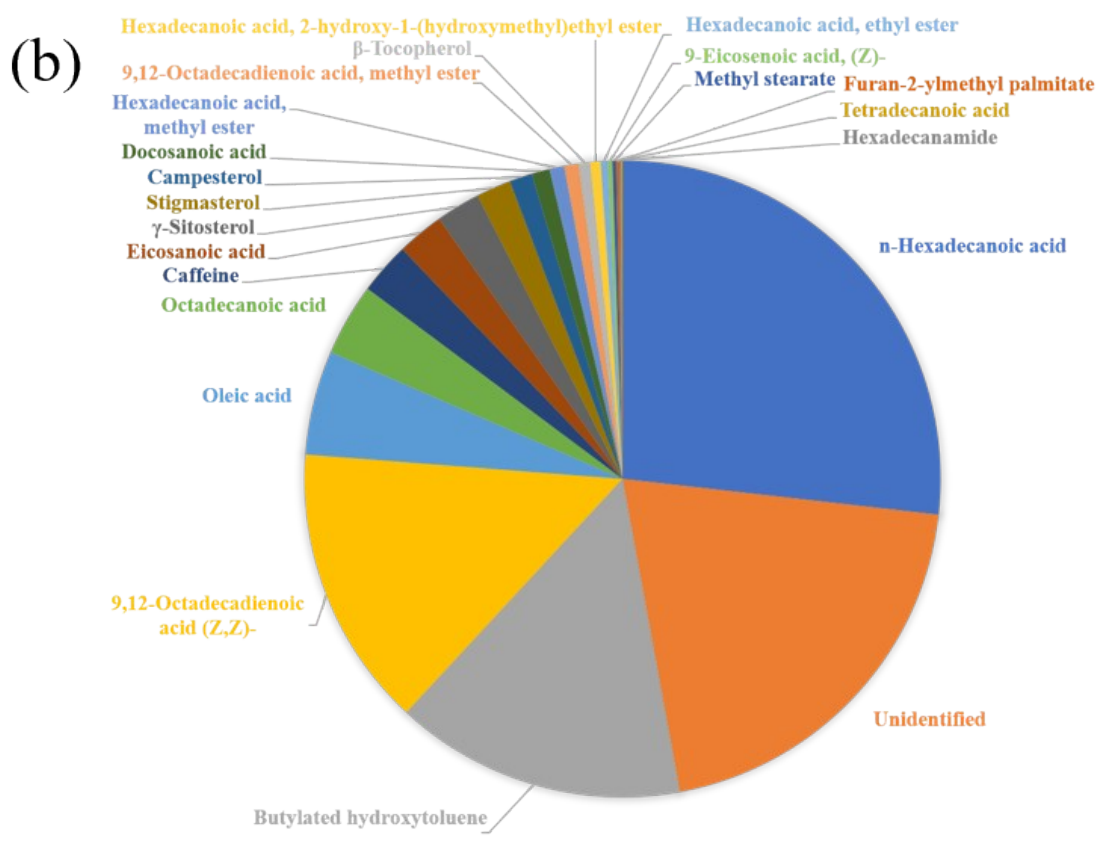
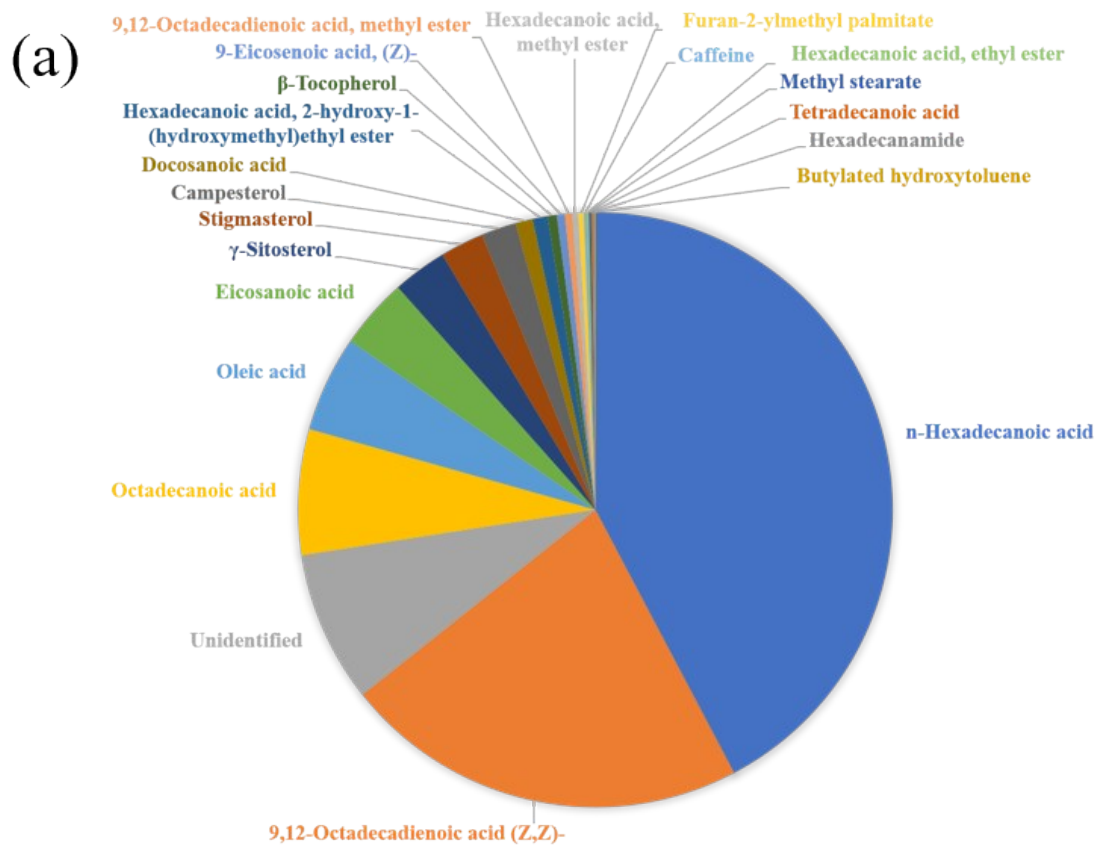
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Fig. S1: Chemical composition of (a) H-CO, (B) T-CO and (c) E-CO



(c)

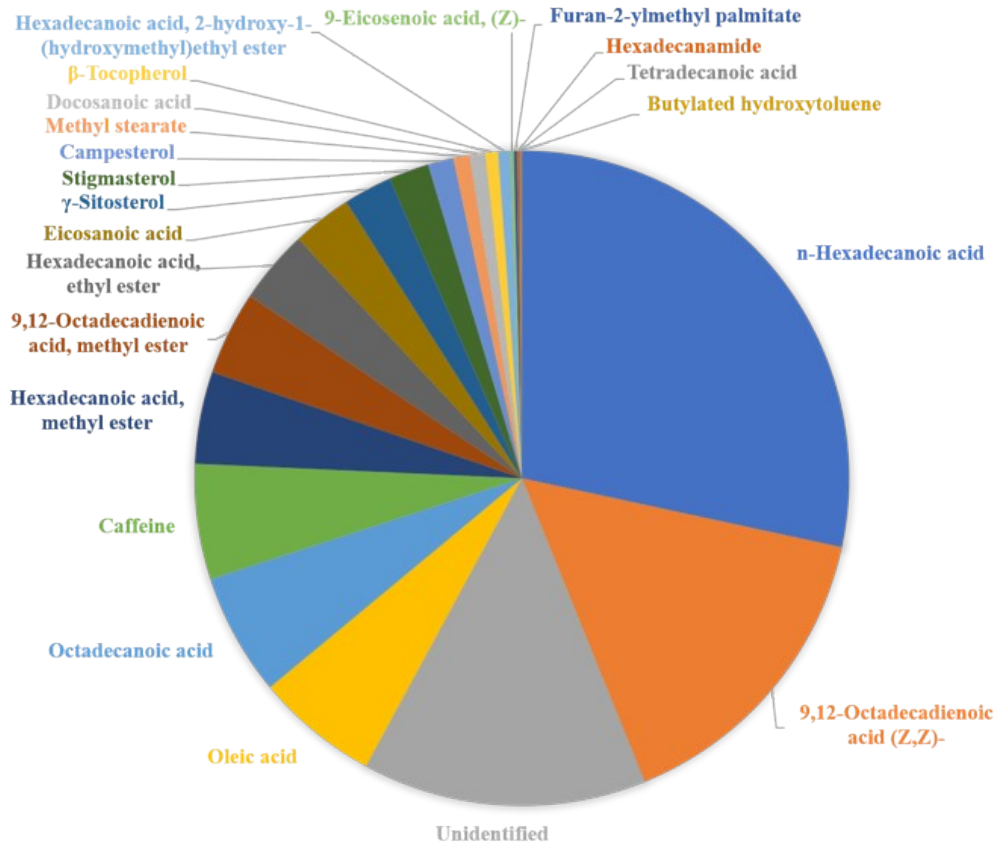


Table S1: Chemical composition of H-CO, T-CO, A-CO and E-CO

Chemical Compound	Coffee Oil Samples			
	H-CO (%)	T-CO (%)	A-CO (%)	E-CO (%)
Caffeine	0.15	2.63	6.37	5.70
Butylated Hydroxytoluene	0.06	14.79	0.33	0.02
Tetradecanoic acid	0.09	0.06	0.08	0.06
Hexadecanamide	0.08	0.10	0.08	0.14
n-Hexadecanoic acid	42.28	26.80	37.39	28.38
Hexadecanoic acid, methyl ester	0.33	0.75	0.19	4.55
9,12-Octadecadienoic acid (Z,Z)-	22.05	14.33	19.27	15.49
Oleic Acid	5.22	5.29	5.01	6.07
Octadecanoic acid	6.83	3.68	6.30	6.03
Hexadecanoic acid, ethyl ester	0.13	0.35	0.06	3.65
9,12-Octadecadienoic acid, methyl ester	0.39	0.73	0.24	4.14
Methyl stearate	0.11	0.19	0.13	0.80
9-Eicosenoic acid, (Z)-	0.44	0.24	0.20	0.17
Eicosanoic acid	3.85	2.39	3.49	2.94
Hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester	0.81	0.53	0.54	0.59
Furan-2-ylmethyl palmitate	0.31	0.16	0.22	0.17
Docosanoic acid	0.94	0.91	1.51	0.77
Campesterol	1.90	1.16	1.58	1.26
Stigmasterol	2.38	1.77	2.38	1.99
γ -Sitosterol	2.95	2.24	3.06	2.39
β -Tocopherol	0.50	0.59	0.88	0.63
Unidentified	8.23	20.31	10.69	14.03

Fig. S2: Surface morphology SEM images of 50 wt% SCG loading in epoxy composite

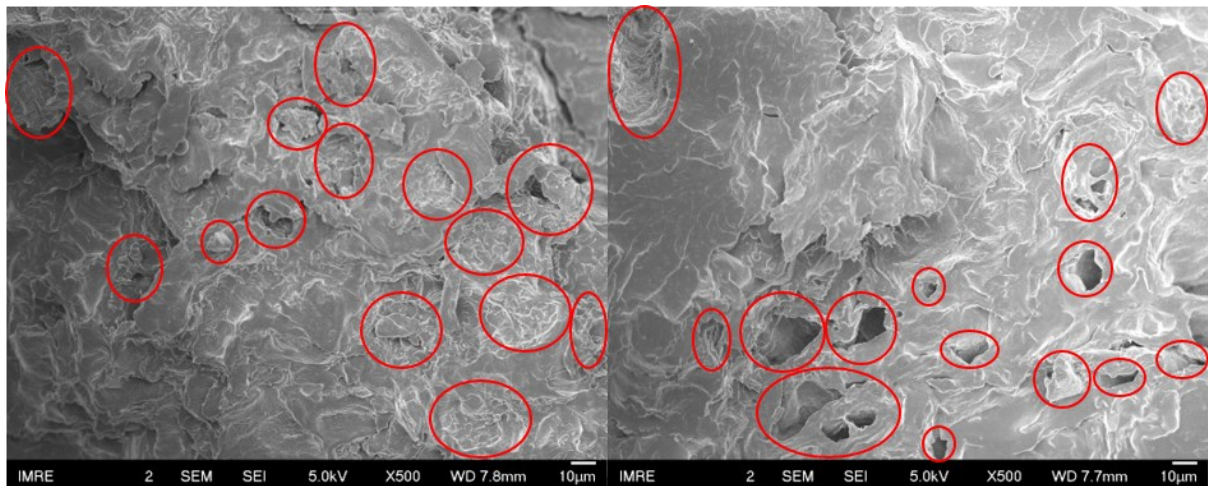


Table S2: Tensile and flexural properties of 50 wt% SCG loading in epoxy composite

Sample	Density (kg/m ³)	Tensile Properties			Flexural Properties		
		Young's Modulus (GPa)	Stress at Maximum (MPa)	Strain at Break (%)	Young's Modulus (GPa)	Stress at Maximum (MPa)	Strain at Break (%)
SCG-Epoxy	-	2.81 ± 0.12	13.9 ± 3.4	0.8 ± 0.2	1.90 ± 0.19	28.2 ± 4.1	1.8 ± 0.2

Table S3: Thermal and degradation properties of Epoxy, SCG and ESCG composites

Sample	Temperature at 95 wt% (°C)	Residue (wt%)	Peak 1 (°C)	Peak 2 (°C)
Epoxy	335	8.5	354	379
SCG-Epoxy	273	16.5	345	376
H-ESCG-Epoxy	276	16.8	342	371
T-ESCG-Epoxy	276	18.6	341	374
A-ESCG-Epoxy	265	16.5	348	375
E-ESCG-Epoxy	262	16.2	342	374

Fig. S3: Images of SCG/ESCG-Epoxy composites

