Wheat straw biochar and its performance in treatment of phenanthrene containing water and microbial remediation of phenanthrene contaminated soil

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Graphical abstract

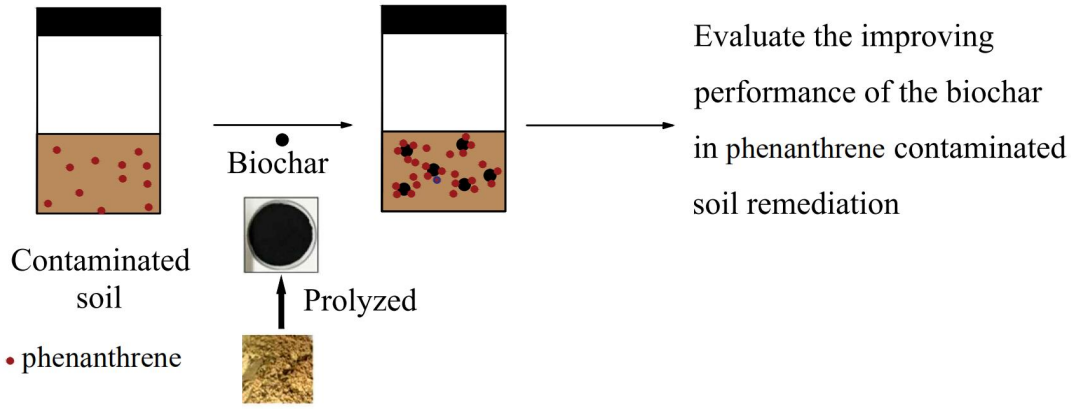

Table S1 Physicochemical characteristics of wheat straw and corresponding biochar

Materials	pH	Elements analysis (%)					Atomic ratio			Surface area (m^2/g)	Total pore volume (cm^3/g)	Pore diameter (nm)
		C	H	O	N	S	H/C	O/C	C/N			
Wheat straw	6.33	43.8	5.9	45.8	4.2	0.3	0.13	1.05	10.4	6.5	0.03	32.8
Biochar	9.48	60.8	1.8	32.4	4.8	0.2	0.03	0.53	12.7	215.8	0.58	12.7

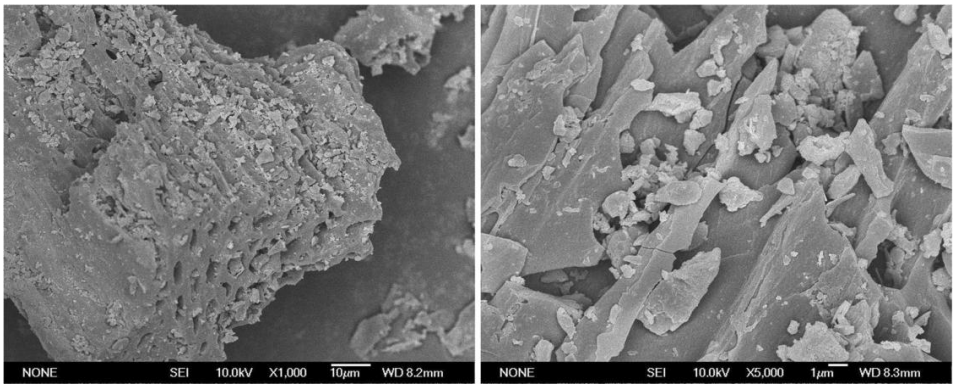

Fig.S1 The microstructure of wheat straw biochar

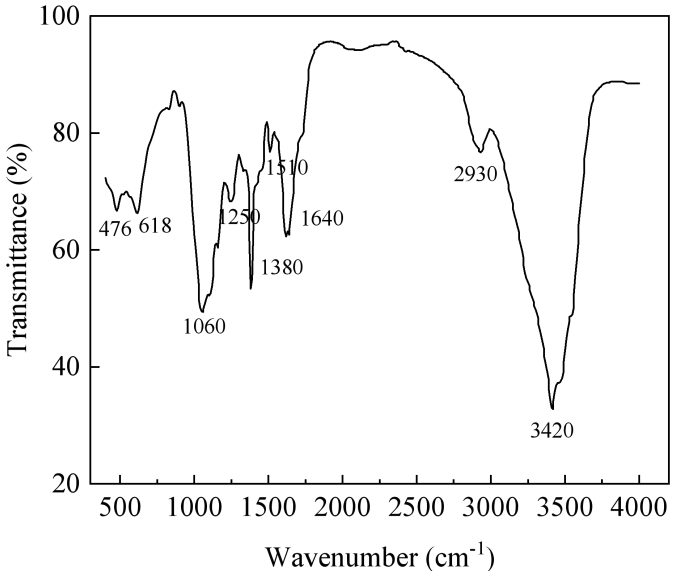

Fig.S2 Infrared spectra of wheat straw biochar

Table S2 Parameters of three kinetics equations

Pseudo-first-order kinetic model	R^2	0.94059
	k_1 (min^{-1})	0.93
	q_e (mg/g)	0.43
	Equation	y=-0.40443x-0.03749
Pseudo-second-order kinetic model	R^2	0.99823
	k_2 [g/(mg·min)]	1.34
	q_e (mg/g)	0.90
	Equation	y=1.10653x+0.91505
Intraparticle diffusion model	R^2	0.87172
	k_d [g/(mg·$min^{0.5}$)]	0.18858
	C(mg/g)	0.34634
	Equation	y=0.18858x+0.34634

Table S3 Parameters of two isotherms models

Langmuir isotherm model	R^2	0.99577
	q_m (mg/g)	1.04
	k_L (L/mg)	37.7
	Equation	y=0.95961x+0.02547
Freundlich isotherm model	R^2	0.87955
	k_f	1.1
	n	5.8
	Equation	y=0.1716x+0.04116