Supporting Information

Synergistic Antioxidant Performance of Lignin and Quercetin Mixtures

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It Includes 6 Pages, 2 Tables and 3 Figures.

Table S1. The physicochemical properties of lignin

Properties	Content
Moisture %	≤2.41
Fixed carbon content %	≤21.01
Ash content %	≤0.16
[a] S/ [b] G/ [c] H %	2/88/10
$\omega(N)\%$	0.2
$\omega(C)\%$	66.61
$\omega(H)\%$	6.285
$\omega(O)\%$	26.905
M_n	1360
M_w	2569
Polydispersity	1.88897

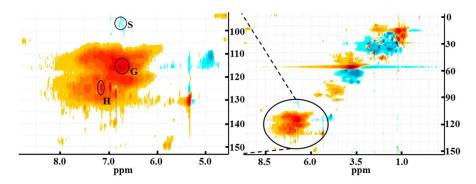[a] S represents syringyl unit.

[b] G represents guaiacyl phenolic unit.

[c] H represents p-hydroxyphenyl unit.

Table S2. UV absorbance of initial and remaining DPPH radicals after being scavenged by lignin, quercetin and their mixture.
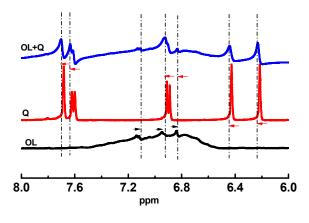
Samples	Initial DPPH	DPPH +Lignin	DPPH +Lignin +4h UV Radiation	DPPH+ Quercetin	DPPH+ Quercetin + 4h UV Radiation	DPPH+ Lignin/ Quercetin	DPPH+ Lignin/ Quercetin +4h UV Radiation
Absorbance	0.380	0.101	0.210	0.016	0.179	0.074	0.126
* Reduction		28.55%		42.95%		13.76%	

* Reduction = $(UV_{Initial}-UV_{Before})-(UV_{Initial}-UV_{After})/UV_{Initial}\times100\%$.
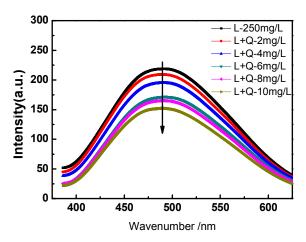
$UV_{Initial}$ represents the absorbance of initial DPPH radicals. UV_{Before} and UV_{After} represent UV absorbance of remaining DPPH radicals after being scavenged by lignin/quercetin mixture before and after 4h UV radiation respectively.

Figure S1. 2D HQSC NMR spectra of lignin.

Figure S2. ^{1}H NMR spectra of lignin, quercetin and their mixture.

Figure S3. Fluorescence spectra of lignin in dioxane aqueous solution with increasing concentration of quercetin.