

Table S1 The physicochemical properties of the PSPs

Method	PSP-D	PSP-H	PSP-S
Color observation	Black.	Cameo brown	Brown
α -Naphthol reaction	(+)	(+)	(+)
Solubility test	Water soluble	Water soluble	Alkali soluble
Iodination reaction	(-)	(-)	(-)
Fehling's test	(+)	(+)	(+)
FeCl ₃ reaction	(-)	(-)	(-)
Peak at UV 280 nm	(+)	(+)	(+)
Phenol–Sulfuric acid test	(+)	(+)	(+)
Coomassie brilliant blue reaction	(+)	(+)	(+)
Sulfuric acid -Carbazole reaction	(+)	(+)	(+)
content of polysaccharide (%)	45.51	53.53	43.92
content of protein (%)	3.50	1.83	2.36
content of glycuronic acid (%)	22.74	21.46	37.12

+ Positive - Negative

Table S2 The result of monosaccharide compositions of PSPs

Preparation number of peak	Molar ratios (mol%)									
	1	2	3	4	5	6	7	8	9	10
	Man	Rib	Rha	GlcUA	GalUA	Glc	Gal	Xyl	Ara	Fuc
PSP-D	1.0	-	-	-	6.63	-	-	-	13.7	8.6
PSP-H	3.7	-	-	-	4.0	1.0	-	-	16.3	5.9
PSP-S	5.8	0.2	-	2.4	9.7	3.4	1.0	5.7	14.2	7.9