Barley – a yet un-tappet feedstock for improved vegetable protein-based wood adhesives

Guodong Zeng [a], Feng Zhu [a], John Tosin Aladejana [a], Ying Zhou[a], Kuang Li [a], Jing Luo [a], Xiaona Li [a], Youming Dong [a], Kaili Wang [a], Jianzhang Li [a, b] *

[a] Co-Innovation Center of Efficient Processing and Utilization of Forest Resources, College of Materials Science and Engineering, Nanjing Forestry University, Longpan Road 159, Xuanwu District, Nanjing 210037, China

[b] MOE Key Laboratory of Wooden Material Science and Application, Beijing Forestry University, Qinghua East Road 35, Haidian District, Beijing 100083, China

* Corresponding author.

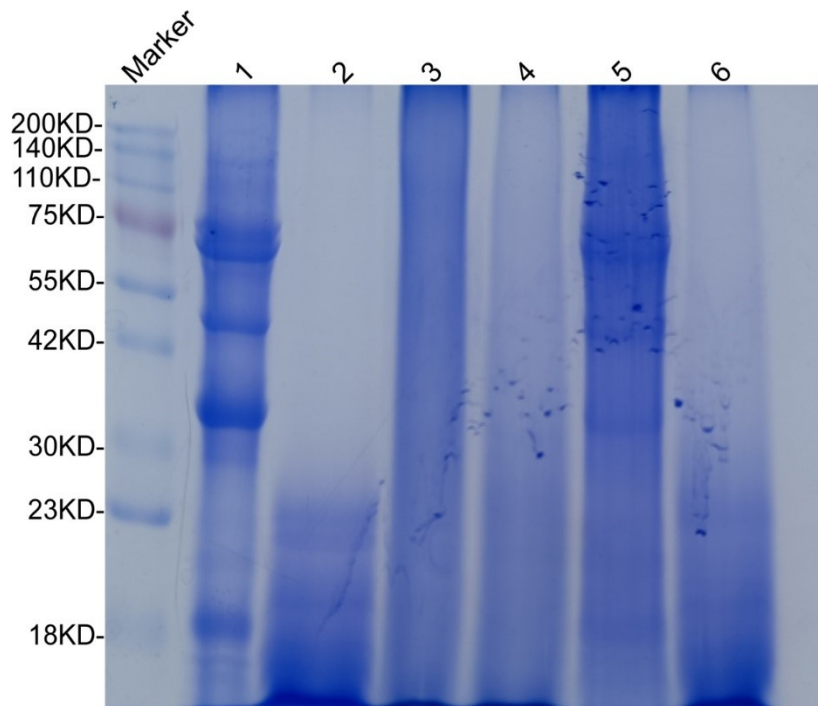E-mail address: lijzh@bjfu.edu.cn (J. Li)

Fig. S1. The SDS-PAGE images of SP, SP-PA, BGP, BGP-PA, SP/BGP, and SP/BGP-
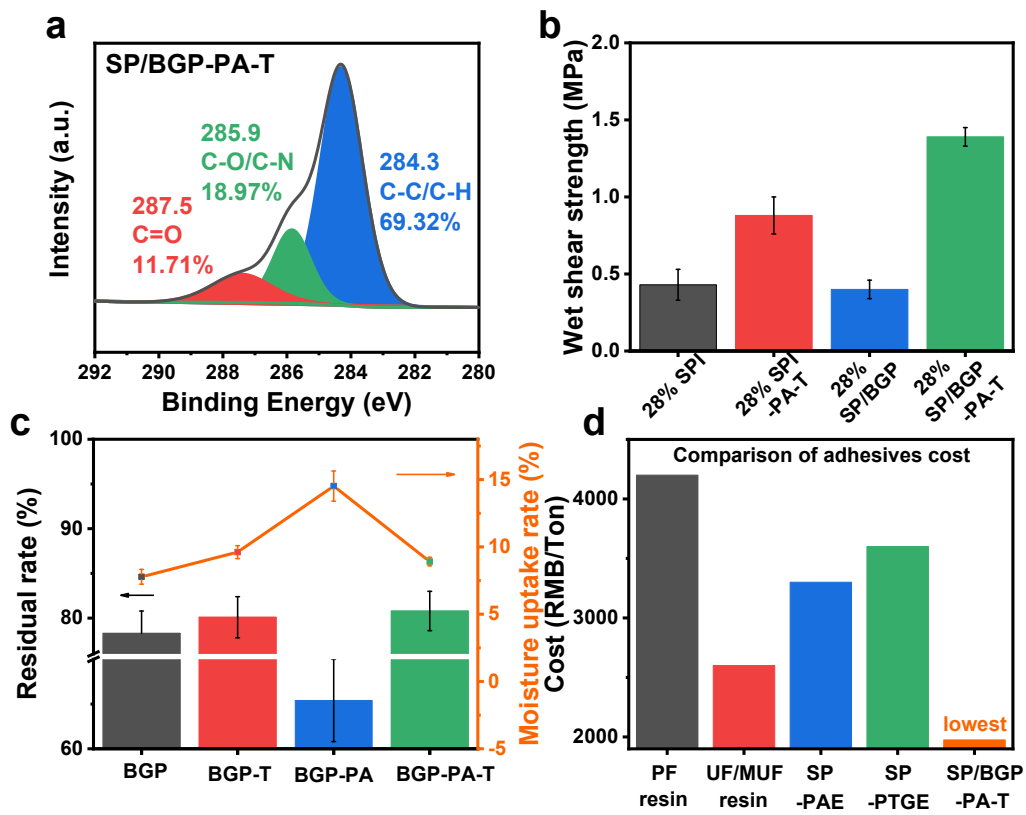
PA adhesives.

Fig. S2. (a) C1s spectrum of SP/BGP-PA adhesive, (b) the wet shear strength of 28%

SP, 28% SPI-PA-T, 28% SP/BGP, and 28% SP/BGP-PA-T adhesives, (c) the moisture absorption and residual rate of BGP based adhesives, (d) comparison of the cost of different adhesives.

Table S1. The cost calculation of SP/BGP-PA-T adhesive (RMB per ton).

Raw materials	SPI	Water	TGA	BG	PA	SP/BGP-PA-T
Unit Price (RMB per ton)	12000	4.16	9540	1300	33000	-
Consumption (Kg)	70	860	30	625	1	-
Cost (RMB)	840	3.58	286.2	812.5	33	**1975.28**

Table S2. The cost calculation of SP/BGP-SDS-T adhesive (RMB per ton).

Raw materials	SPI	Water	TGA	BG	SDS	SP/BGP-SDS-T
Unit Price (RMB per ton)	12000	4.16	9540	1300	6000	-
Consumption (Kg)	70	860	30	625	10	-
Cost (RMB)	840	3.58	286.2	812.5	60	**2002.28**

Table S3. The cost calculation of SP/BGP-pH11-T adhesive (RMB per ton).

Raw materials	SPI	Water	TGA	BG	NaOH	SP/BGP-pH11-T
Unit Price (RMB per ton)	12000	4.16	9540	1300	5400	-
Consumption (Kg)	70	860	30	625	10	-

Cost (RMB)	840	3.58	286.2	812.5	54	**1996.28**

Table S4. The price of different plywood adhesives.

Formulation of adhesives for the wood industry	Price per ton (RMB)
Phenol formaldehyde (PF) resin adhesive	**4200**
Urea-formaldehyde (UF) resin adhesive	**2400**
14% SPI + 28% PAE (12.5% solids content) +58% water	**3300**
14% SPI + 4% PTGE + 82% water	**3600**
SP/BGP-PA-T	**1975.28**

Table S5. The comprehensive performance (Wet shear strength, Residual rate, Chemical fossil product addition, Viscosity, and Cost) of SP/BGP-PA-T adhesive as compared to the previously reported SPI-based and SM-based adhesives.

Soy-based adhesive (SPI/SM)	Wet shear strength (MPa)	Residual rate (%)	Chemical fossil product addition	Viscosity (Pa·s)	Cost (RMB/Ton)	References
SP/BGP-PA-T	1.55	83.4%	0	5.07	1975.28	
SPI/BP@mica12	1.05	-	1.44%	-	4300	**1**
SPI-DBA@HBPA-CPBA-Ag	1.28	-	2.8%	91.41	-	**2**
SPI/TGA/WPF-PDA/Cu(OH)$_2$	1.22	72.8%	1.5%	-	-	**3**
SM-T-CSSH	1.49	79.2%	2.45%	61.96	-	**4**
SM@BDAB-HDE	1.25	80.0%	8.8%	-	-	**5**
SM-DACS-HNTs@N	1.53	79.2%	0.7%	-	2673	**6**
SM/TTE/CDs/BT@PDA@PANI	1.16	84%	4%	-	2532	**7**
SM-CA/TA/FC-HNTs@SH	1.46	77.1%	0.8%	33.0	2200	**8**
SM-PM	1.02	74.55%	0	14.96	-	**9**
SP–HBPE-SB	0.9	70.6%	3.85%	-	2020	**10**
TSM/SEP/KH-560	1.18	76.8%	1%	73.04	-	**11**
SPI/EHL-ESO-7	1.07	-	6.9%	-	-	**12**

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