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Supplementary Methods

1. Polymerization degree determination of BO

To identify the polymerization degree of BO, HPLC-MS analysis was performed on an ultra-high performance liquid chromatography system (SCIEX, Framingham, MA, USA) with an Agilent Poroshell Hilic column (2.1 × 100 mm, 2.7 μm) (Santa Clara, CA, USA) fitted with a Triple TOF 4600 high-resolution mass spectrometry system (SCIEX, Framingham, MA, USA). The mobile phase was composed of 0.1% aqueous formic acid (A) and acetonitrile (B). The gradient elution was performed as follows: 0-1 min, 100% B; 1-2 min, 100% to 85% B; 2-32 min, 85% to 50% B; 32-33 min, 50% to 20% B; 33-37 min, 20% to 85% B; 37-44 min, 85% B. The injection volume was 10 μL and the flow rate was 0.03 mL/min. The ESI source in positive ion mode was used with resolving power 30,000 and a scan range of m/z 100-1000. The parameters were set as followed: capillary temperature, 600 °C; ion spray voltage, 5.5 kV in positive ion mode; sheath and auxiliary gas flow rate, 55 psi; collision energy, 35 eV.

Supplementary Figures

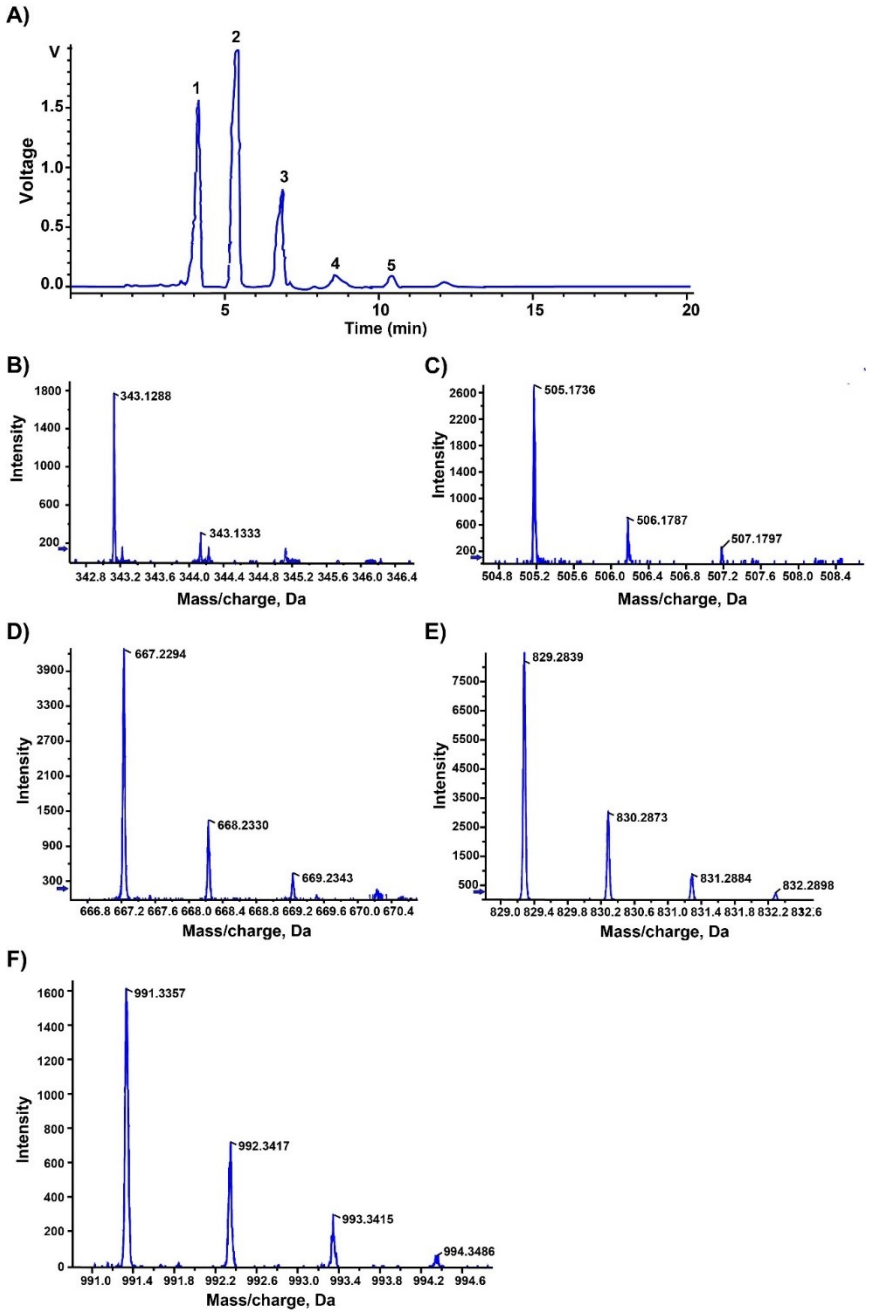

Fig. 1. Polymerization degree analysis of *Bletilla striata* oligosaccharides (BO). (A) HPLC of BO. (B) Disaccharide mass spectrogram of BO. (C) Trisaccharide mass spectrogram of BO. (D) Tetrasccharide mass spectrogram of BO. (E) Pentasaccharide mass spectrogram of BO. (F) Hexasaccharide mass spectrogram of BO. Peak 1, BO dimerization; Peak 2, BO trimerization; Peak 3, BO tetramer; Peak 4, BO pentamerization; Peak 5, BO hexamer.

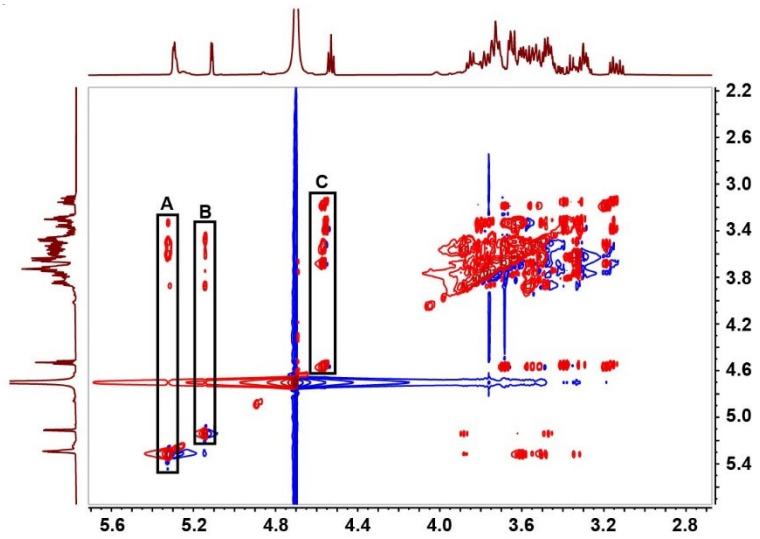

Fig. 2. ^{1}H-^{1}H TCOSY NMR spectrum of BO. A, B, and C represent three different sugar residues, respectively.

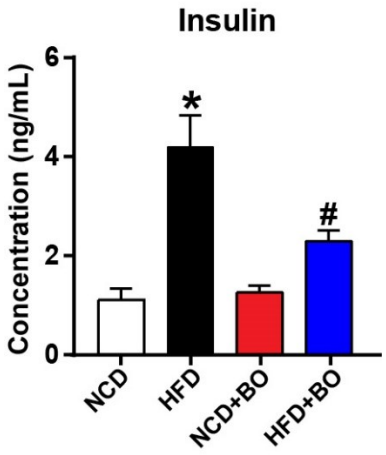

Fig. 3. Level of fasting insulin among experimental groups. Data were presented as mean ± SEM. $^{*}P < 0.05$, $^{**}P < 0.01$ *vs* NCD group; $^{\#}P < 0.05$ *vs* HFD group.

Supplementary Tables

Table 1. List of primer sequences for RT-PCR analysis

Name	Forward primer	Reverse primer
Scd1	TGACCTGAAAGCCGAGAA	CGTTGAGCACCAGAGTGTAT
Srebp1	ACCTGAAAGCCGAGAA	GAAGGTGCTAACGAACA
Abcg1	GTGGATGAGGTTGAGACAGACC	CCTCGGGTACAGAGTAGGAAAG
Col1a1	GCTCCTCTTAGGGGCCACT	CCACGTCTCACCATTGGGG

Table 2. Polymerization degree analysis of BO

Name	Formula	Adduct	Extraction Mass	Intensity
BO dimerization	$C_{12}H_{22}O_{11}$	$[M+H]^+$	343.12	5723
BO trimerization	$C_{18}H_{32}O_{16}$	$[M+H]^+$	505.18	19128
BO tetramer	$C_{24}H_{42}O_{21}$	$[M+H]^+$	667.23	44031
BO pentamerization	$C_{30}H_{52}O_{26}$	$[M+H]^+$	829.28	88319
BO hexamer	$C_{36}H_{62}O_{31}$	$[M+H]^+$	991.33	31881