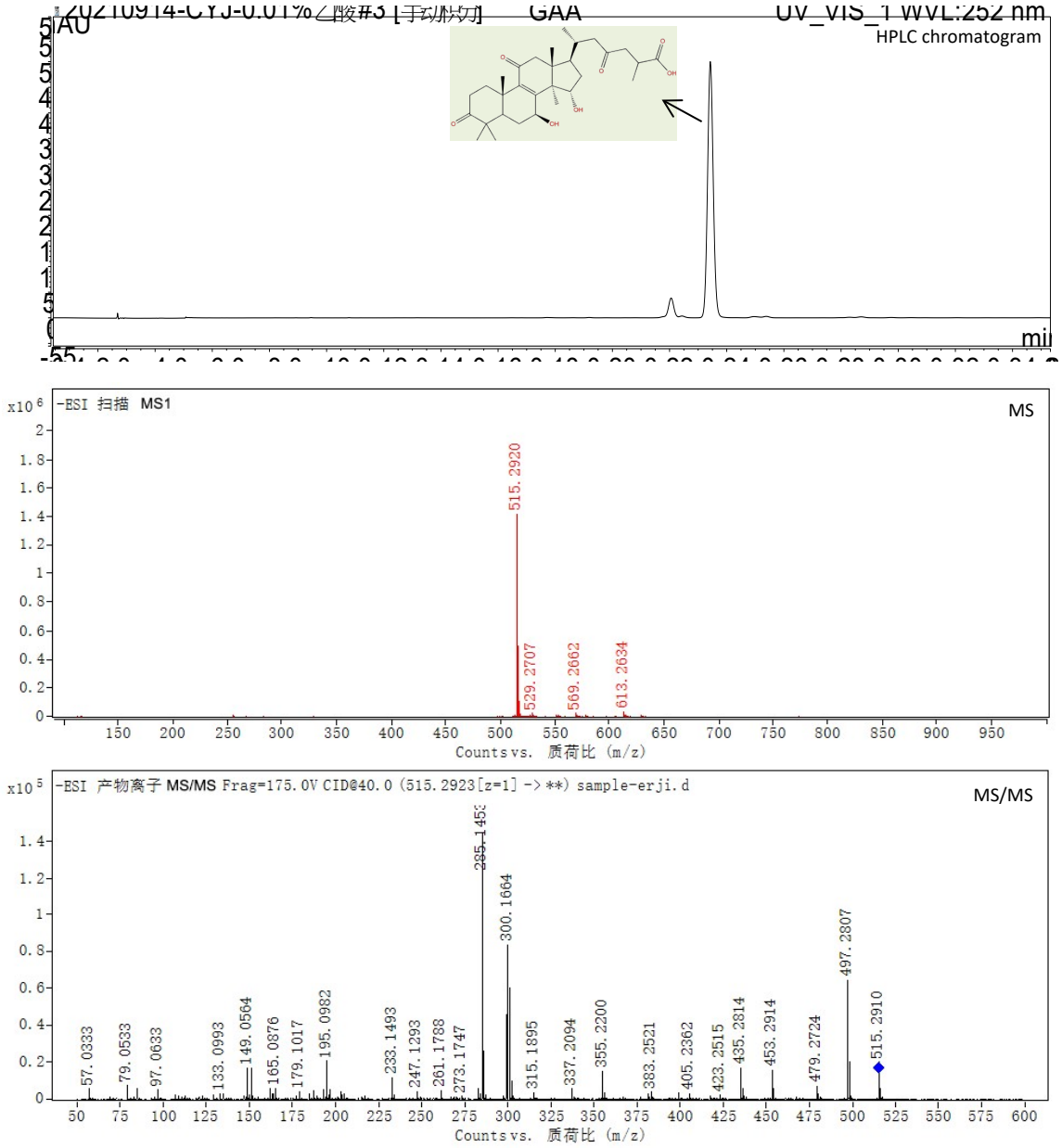
Electronic Supplementary Material (ESI) for Food & Function.
This journal is © The Royal Society of Chemistry 2022

Supplementary Materials-1

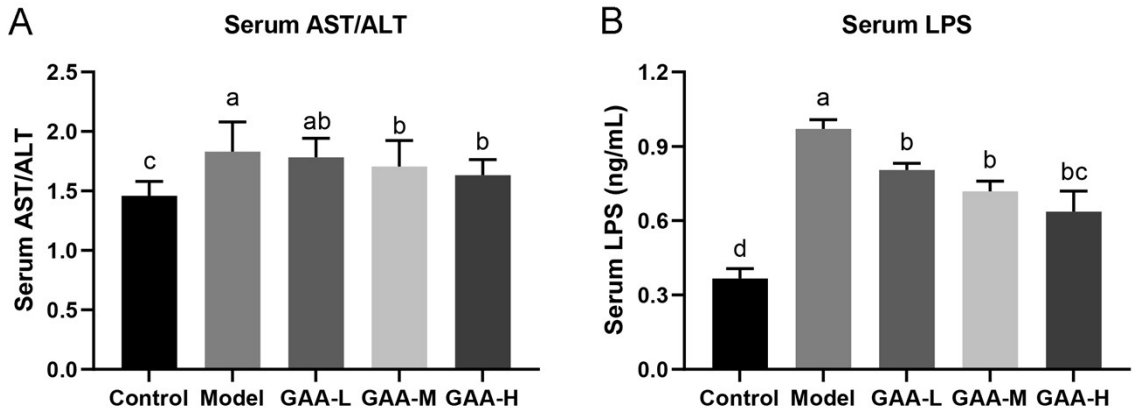
Supplementary Figure. S1. Purity verification of ganoderic acid A (GAA) through high performance liquid chromatography (HPLC) coupled with a QTOF electrospray ionization MS system.



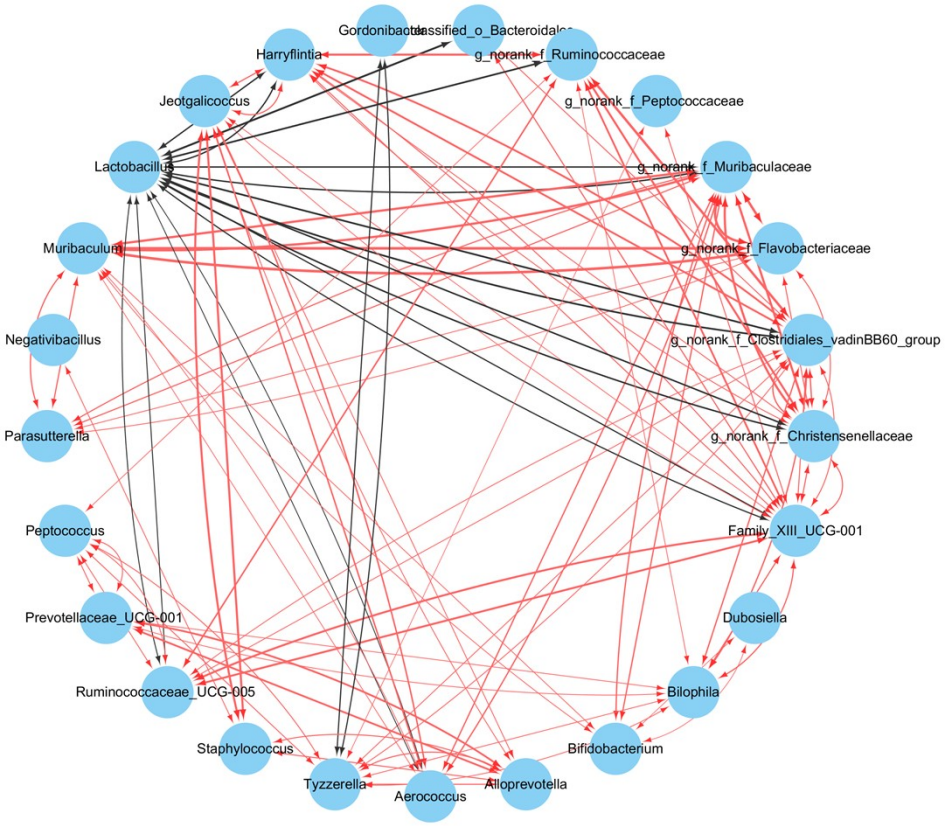
Instrumentation, chromatography and ESI-MS operating conditions

Agilent 1260 HPLC system (Agilent, CA, USA) equipped with a diode-array detector were used to the purity verification of ganoderic acid A (GAA) in tihs study. Waters Acquity BEH C18 column (2.1 × 150 mm i.d., 1.7 μm, Waters, Milford, MA, USA). was used for separation. The mobile phase was consisted of 0.2% acetic acid in water (A) and acetonitrile (B) with gradient elution: 0–8 min, 3% B-22% B; 8–25 min, 22% B-25% B; 25–40 min, 25% B-35% B; 40–65 min, 35%B-100%B, 65–70 min, 100%B–100% B. The flow rate was 0.3 mL/min, injection volume was 1 μL and the column temperature was 25 °C, and the detection wavelength was set at 257 nm. A high-resolution QTOF mass spectrometer (Agilent 6530, Agilent, CA, USA) equipped with an electrospray ionization (ESI) source was operated in the negative ion mode. The mass range was set at *m/z* 100–1500 in the full scan mode. The capillary voltage was set at 3500 V. The source temperature was set at 250 °C. Nitrogen was used as the drying gas. The gas flow rate was set at 8 L/min. MS2 data analysis of the three highest intensive ion fragments was intelligently performed in real time.

Supplementary Figure. S2. Effects of ganoderic acid A administration on the serum AST/ALT ratio (De Ritis ratio) and serum LPS levels in mice exposed to alcohol intake. Values were expressed as mean ± SEM, and the different letters represent significant differences between different experimental groups ($P < 0.05$).



Supplementary Figure. S3. The correlation network of different intestinal microbial phylotypes with significant differences among different experimental groups (Correlation network was generated by Cytoscape software [Ver. 3.7.2]. Red lines and black lines represent positive and negative correlations, respectively. Line width indicates the strength of correlation. Only the significant edges were drawn in the network based on Spearman's correlation ($|r| > 0.5$, $P < 0.05$).



Supplementary Table. S1. Composition and energy distribution of the mice diet used in the animal experiment

Ingredients	%	Nutritional Components	%
Corn meal	52	Protein	20
Soybean flour	23	Fat	10
Wheat bran	11	Carbohydrate	70
Flour	9		
Calcium salt	2		
Mixed vitamin	3		