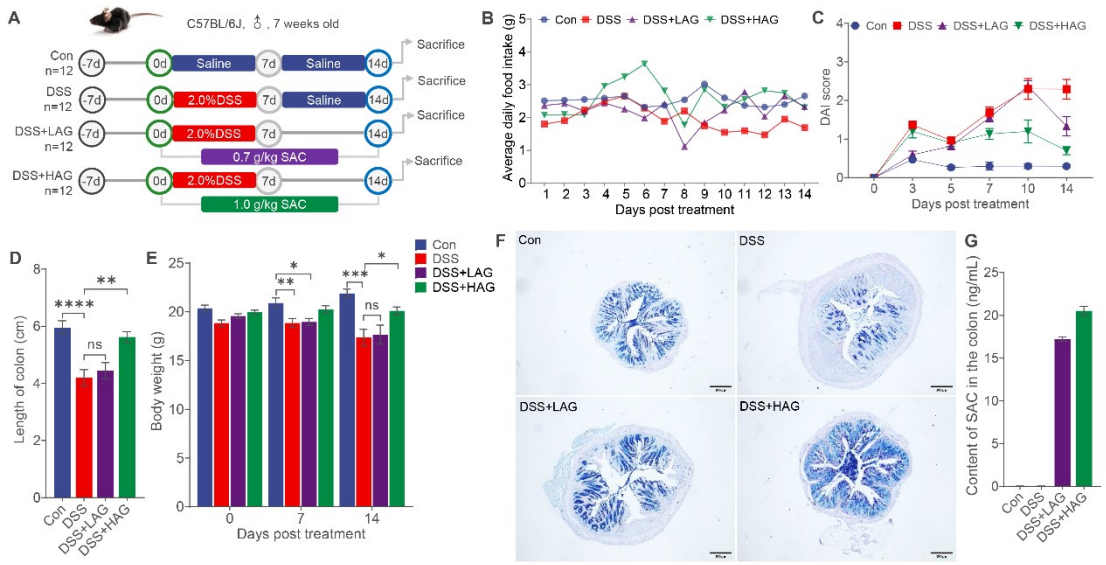
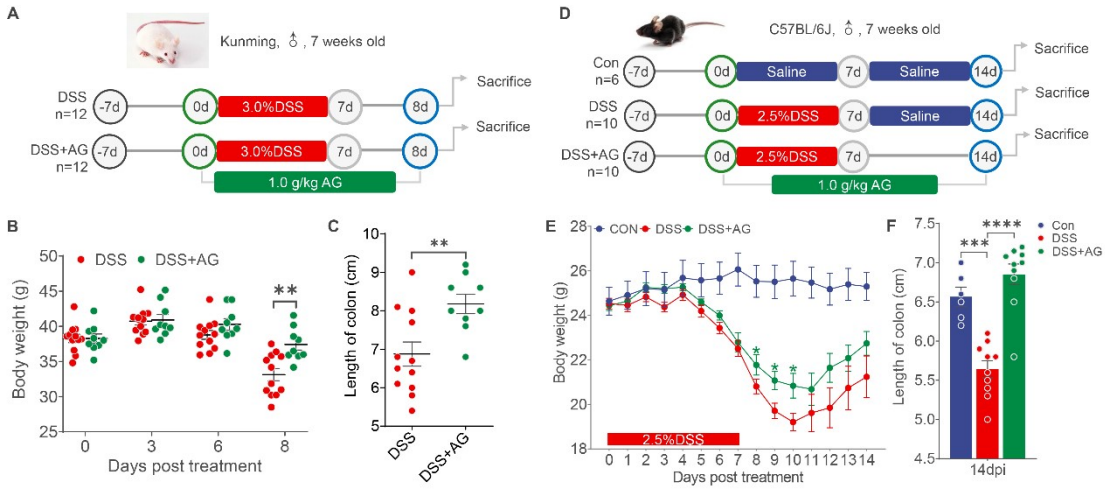
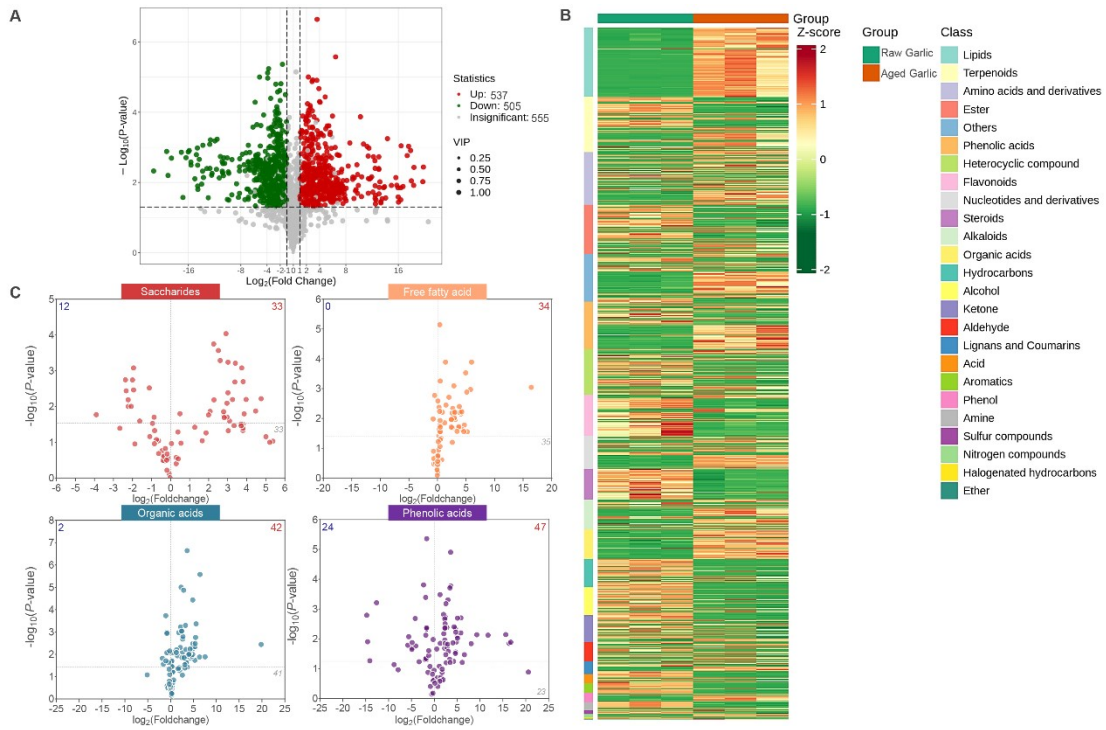
Supplementary figures



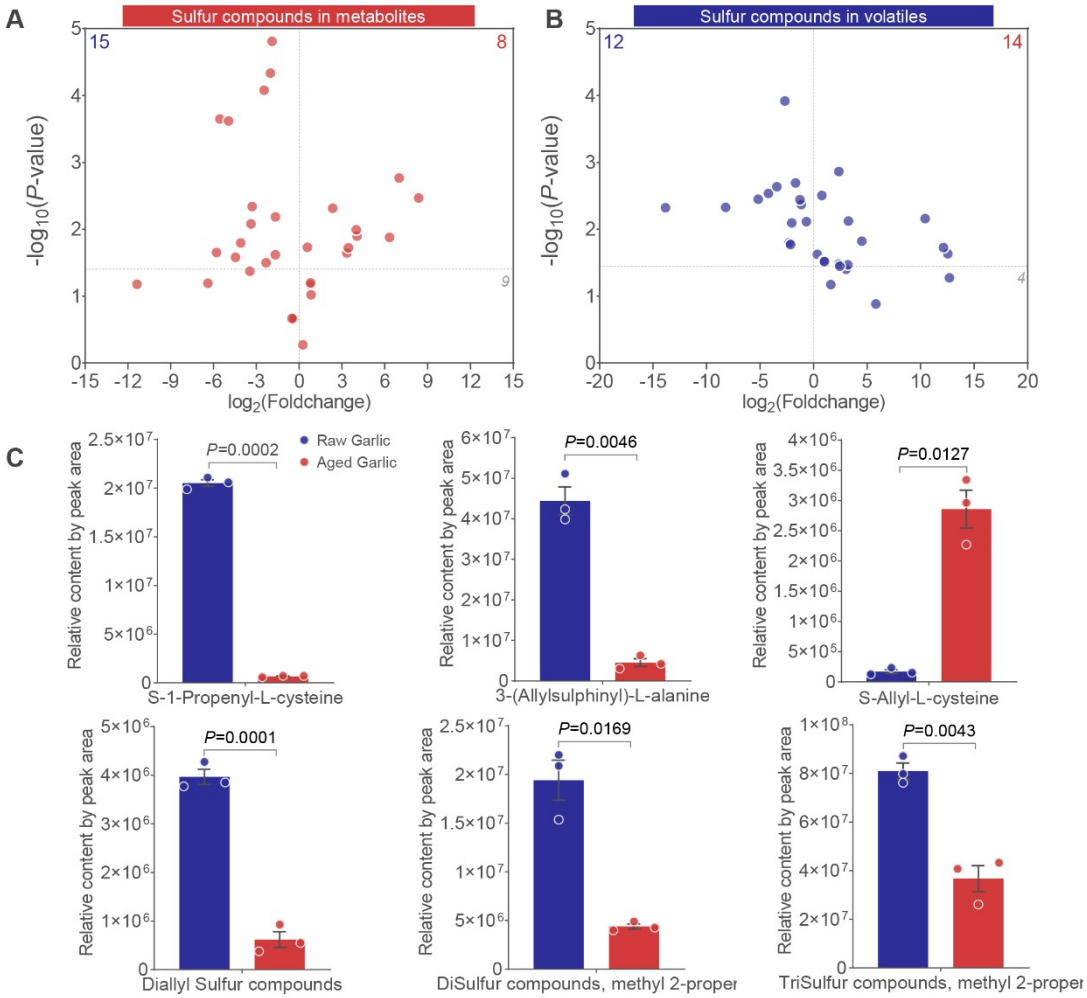
Supplementary Fig.1 Protective effect of oral different doses of AG on DSS-induced experimental colitis. (A) Diagram illustrating the mouse model of colitis employed in this study. Oral phosphate buffer saline (PBS), low dose of aged garlic (LAG) and high dose of aged garlic (HAG) treatments are indicated; Average daily food intake (B), DAI score (C), length of colon (D), and body weight (E) from each group after treatment. (F) Alcian blue stained colon sections from different groups. (G) Content of S-allyl-L-cysteine (SAC) from different groups.



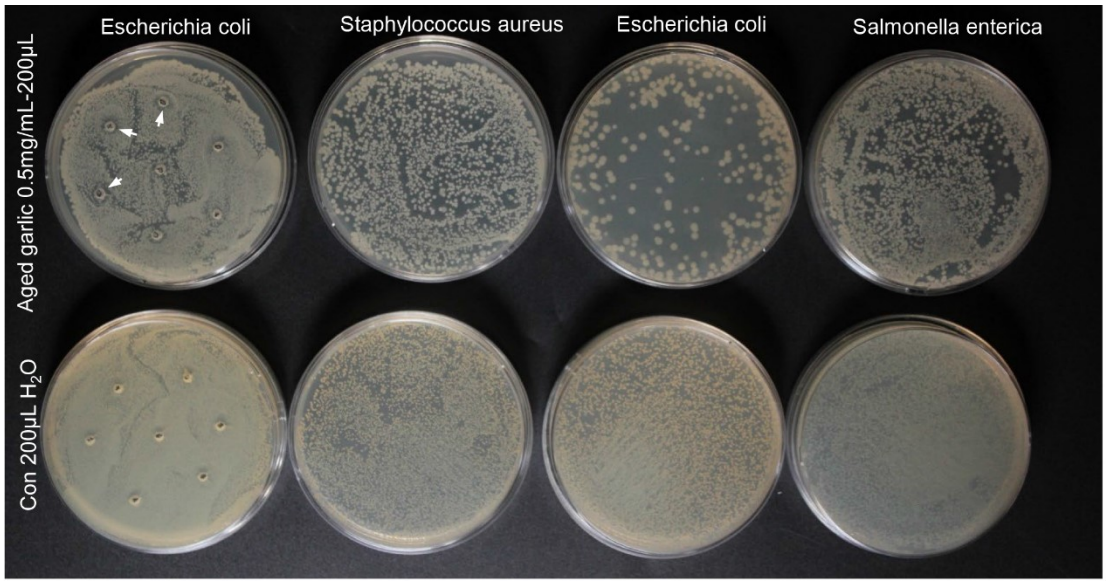
Supplementary Fig.2 Protective effect of oral AG on different content of DSS-induced experimental colitis. (A) Diagram illustrating the Kunming mouse model of colitis employed in this study. Oral 3% dextran sulphate sodium salt (DSS), 1.0 g/kg aged garlic (AG) treatments are indicated; Body weight (B) and length of colon (C) from each group after treatment. (D) Diagram illustrating the C57BL/6 J mouse model of colitis employed in this study. Oral 2.5% DSS, 1.0 g/kg AG treatments are indicated; Body weight (E) and length of colon (F) from each group after treatment.



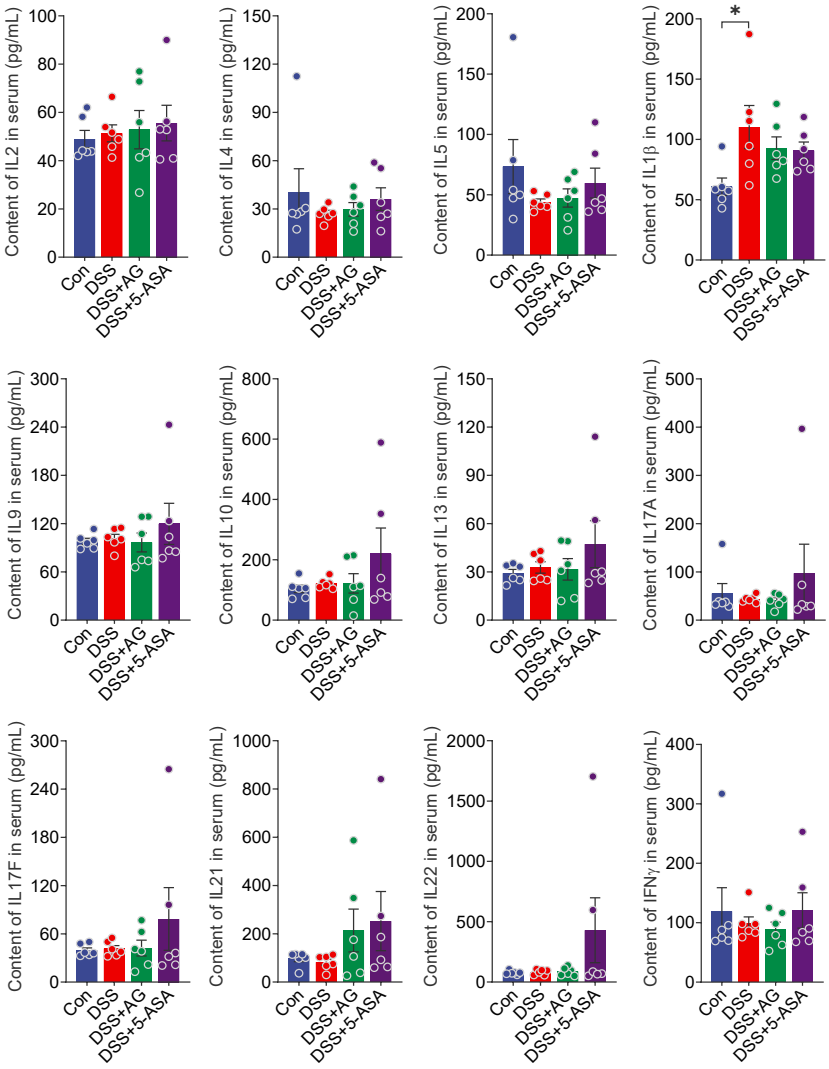
Supplementary Fig.3 Comparison of raw garlic and aged garlic bioactive compounds composition. Volcano map (A) and heatmap (B) showed composition of up-regulated and down-regulated compounds in aged garlic. (C) Volcano map showed the highly up–regulated compounds of saccharides, free fatty acid, organic acid, and phenolic acids in the aged garlic.



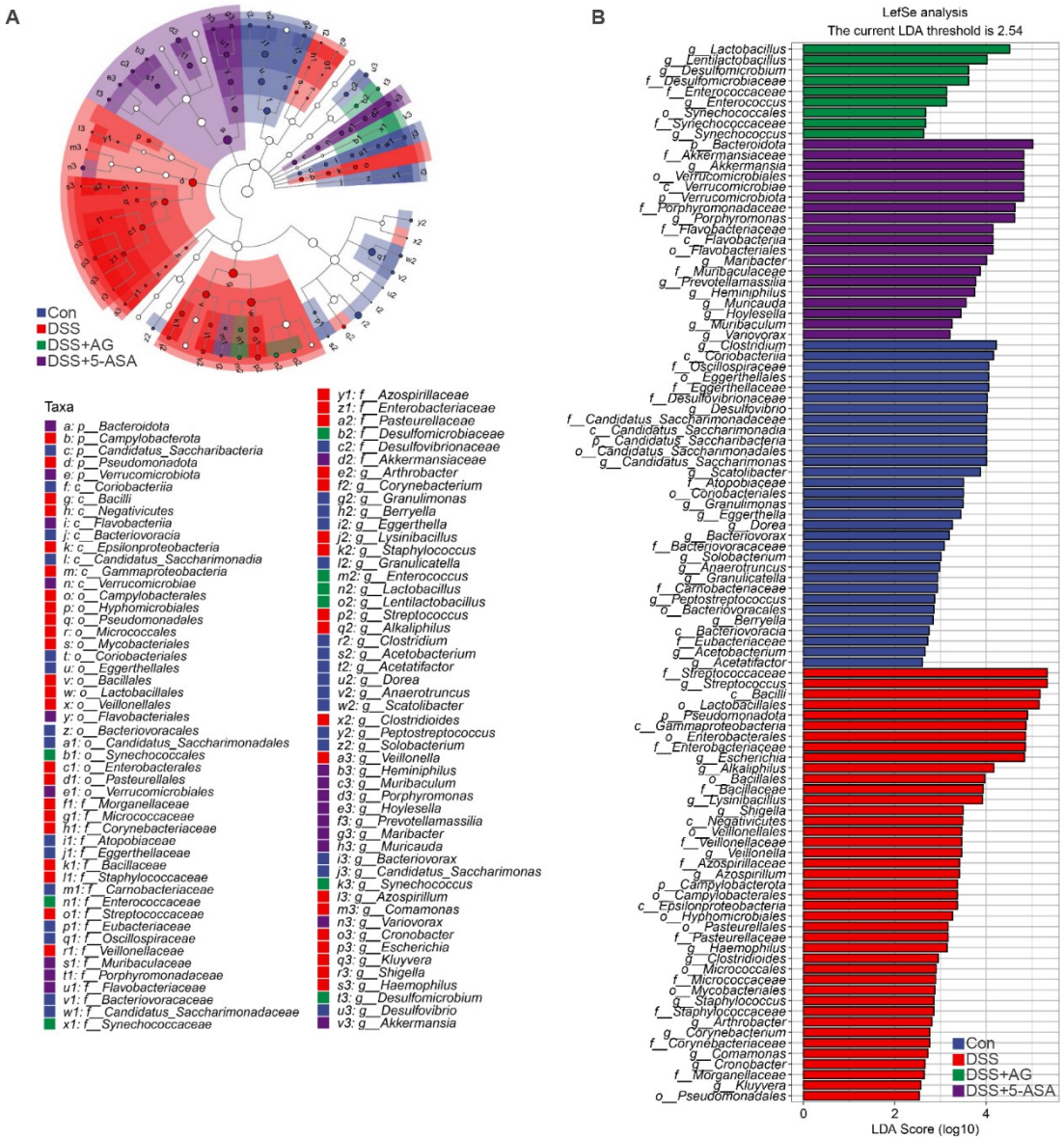
Supplementary Fig.4 The changes and relative abundance of sulfur compounds detected in garlic before and after aging process. Unregulated and downregulated sulfur compounds detected by LC-MS (A) and GC-MS (B). (C) Differences of relative contents of specific garlic sulfur compounds between raw garlic and aged garlic.



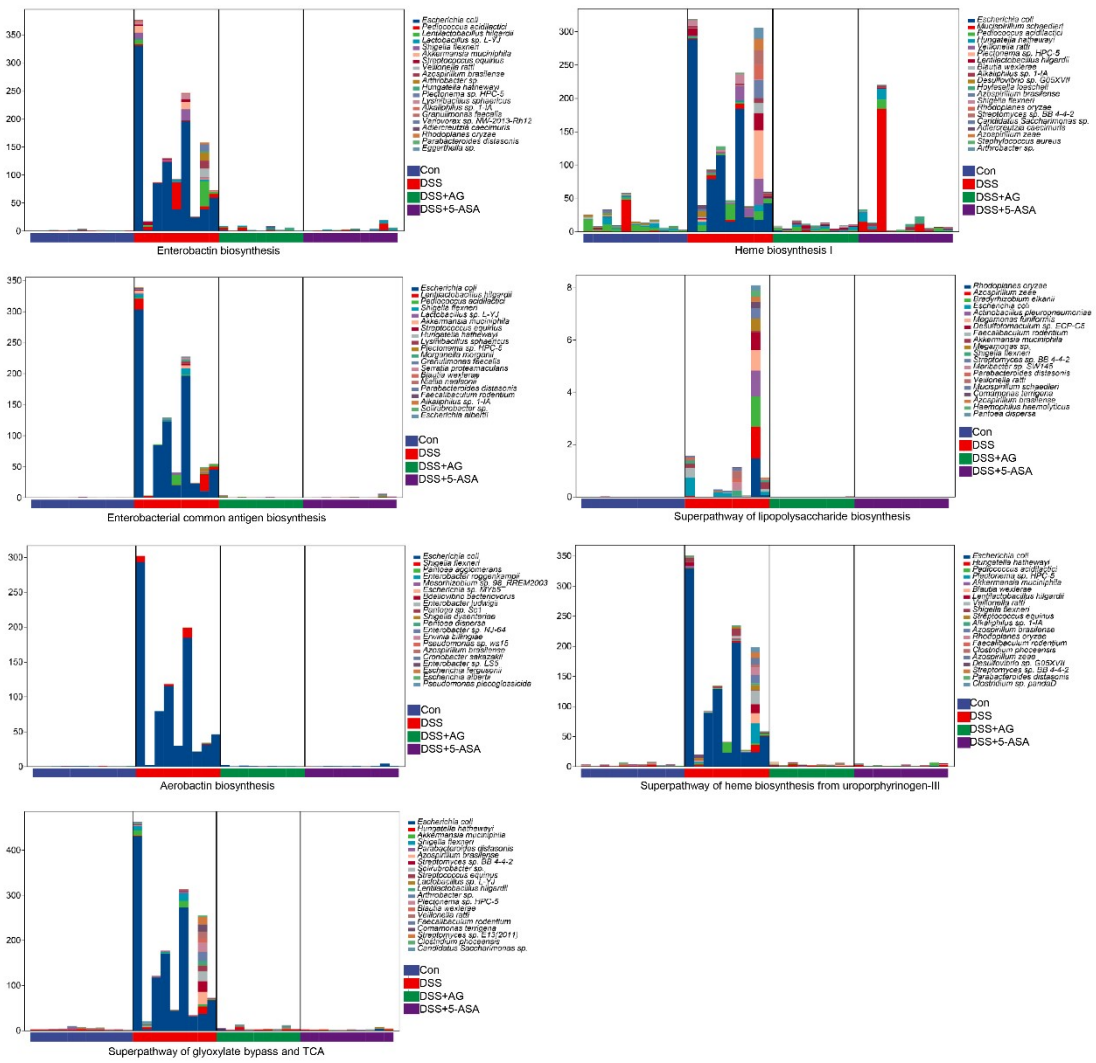
Supplementary Fig.5 The anti-bacteria effect of water extract from AG. Water extract of AG at 0.5 mg/mL added in the culture medium can partly inhibited proliferations of *Escherichia coli*, *Staphylococcus aureus*, and *Salmonella enterica*.



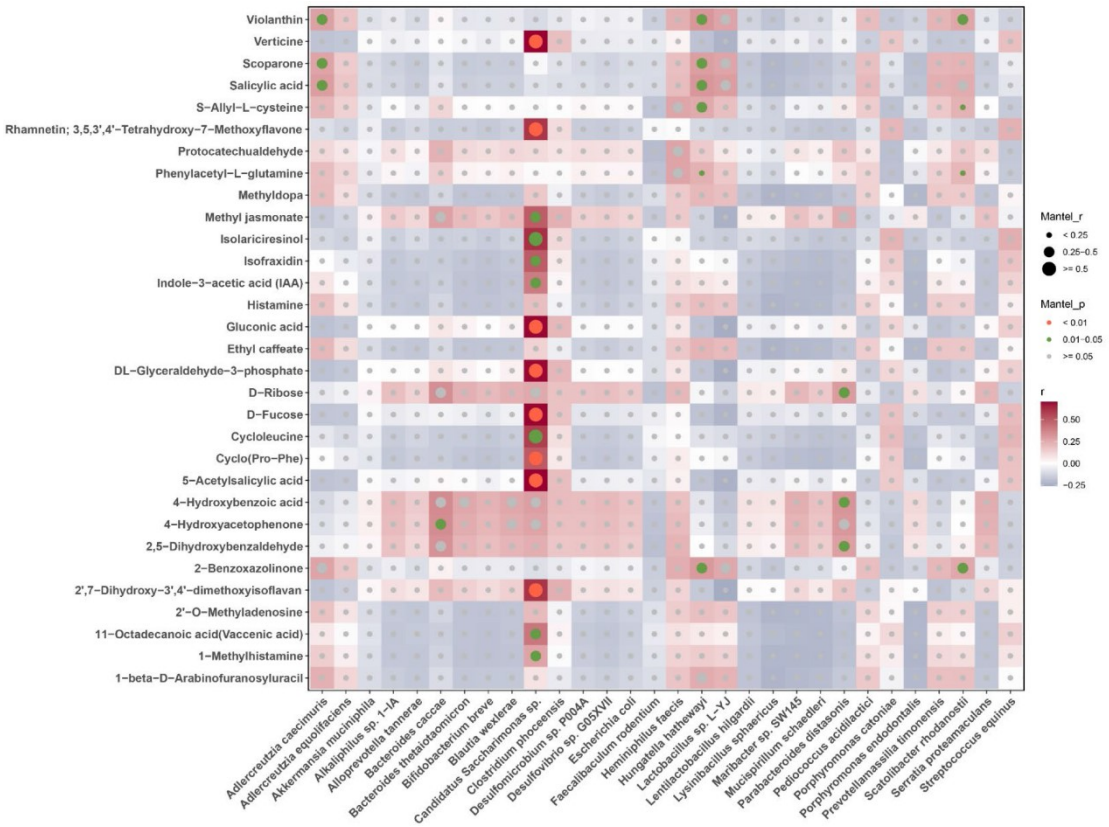
Supplementary Fig.6 Comparison of cytokines in the serum between different treatments. DSS significantly increased IL-1β expression but oral AG and 5-ASA not deduced its expression on day 14. Other cytokines showed no significant changes among different groups.



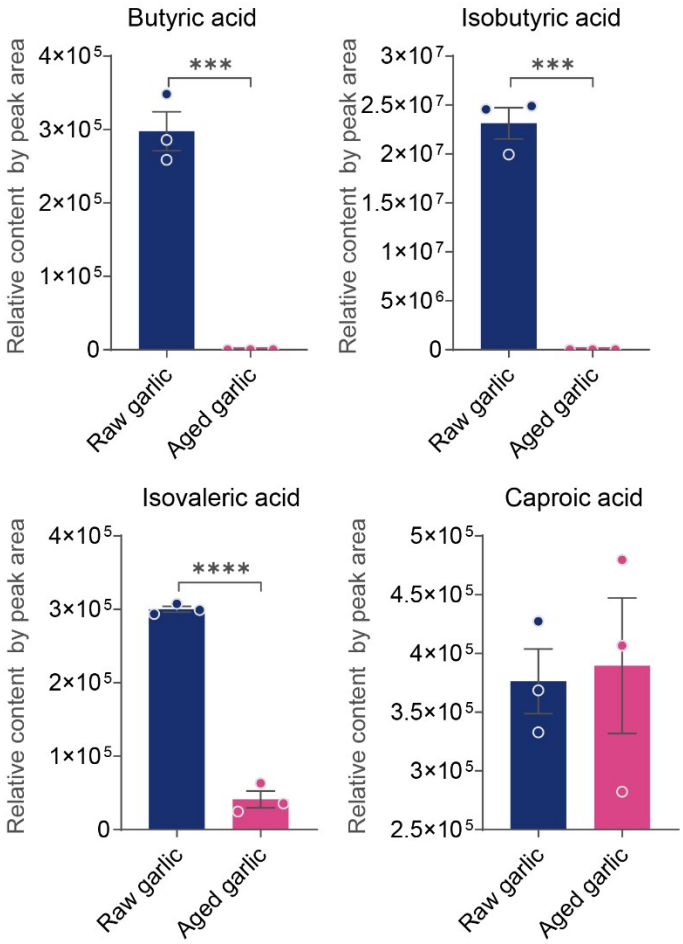
Supplementary Fig.7 Lefse analysis of composition and relative abundance of fecal bacteria. (A) Cladogram showed the composition of bacteria induced by DSS, and attenuation of fecal bacteria after oral treatment of AG and 5-ASA. (B) Effect size rank of the relative abundance of differential bacteria species in each group.



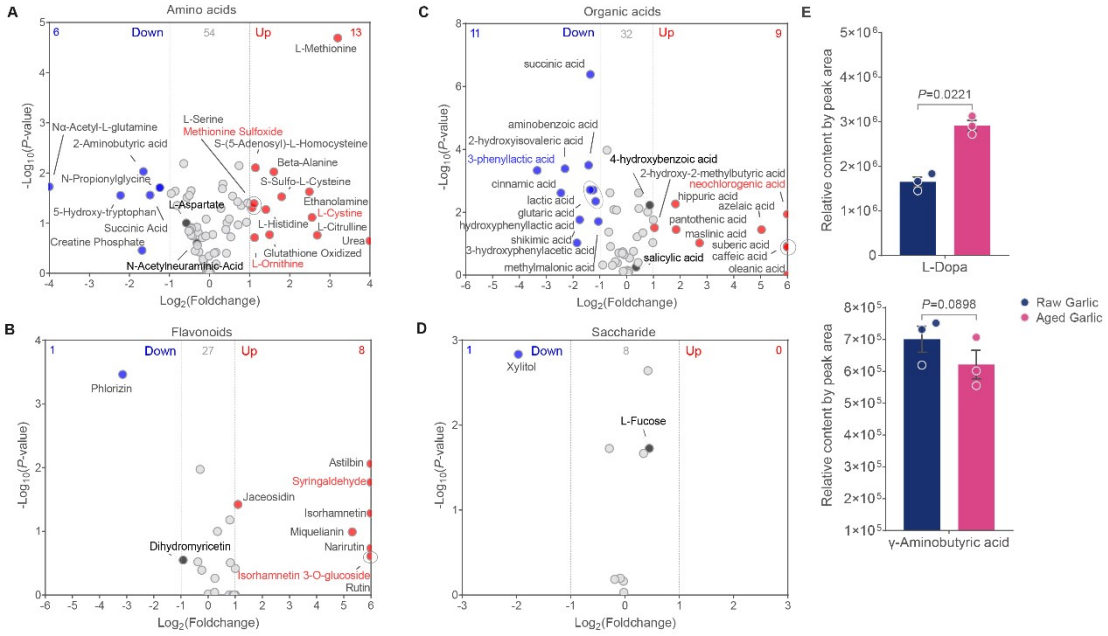
Supplementary Fig.8 The contribution of screened bacteria species for the enriched metabolic pathways between different groups. The metabolic pathways were significantly enriched in the DSS group, and were closely related to *Escherichia coli*.



Supplementary Fig.9 The association between bioactive compounds of AG and modulated bacterial species. The bioactive compounds in AG positively correlated with the probiotics, such as *candidatus saccharimonas*, *Hungatella hathewayi*, *Parabacteroides distasonis*, *Scatolibacter rhodanostii*, *Bacteroides caccae*, and *Adlercreutzia caecimuris*. *Escherichia coli*, *Escherichia coli*, *Lysinibacillus sphaericus*, *Streptococcus equinus*, and *Alkaliphilus sp. 1-IA* had a strong negative correlation with the bioactive compounds of AG, especially S-Allyl-L-cysteine.



Supplementary Fig.10 The relative content of butyric acid, isobutyric acid, isovaleric acid, and caproic acid detected in aged garlic by GC-MS.



Supplementary Fig.11 Quantification of amino acids (A), organic acids (B), flavonoids (C), and saccharide (D) in the single–clove and multi–clove aged garlic by LC-MS. (E) The relative content of L-DOPA and γ-aminobutyric acid detected in aged garlic by LC-MS.