Microbiome- metabolomics deciphers the effects of *Cistanche deserticola* polysaccharides on the aged constipation rats

Xiaojie Liu[a, b, c*], Chen Jian[a, b, c], Mengyu Li[a, b, c], Fuxiao Wei[a, b, c], Huanle Liu[a, b, c],

Xuemei Qin[a, b, c*]

a. Modern Research Center for Traditional Chinese Medicine, Shanxi University, Taiyuan, 030006, China

b. the Key Laboratory of Chemical Biology and Molecular Engineering of Ministry of Education, Shanxi University, Taiyuan, 030006, China

c. Key Laboratory of Effective Substances Research and Utilization in TCM of Shanxi Province, Tai Yuan, 030006, China

* Correspondence to Dr. Xiaojie Liu
E-mail: liuxiaojie@sxu.edu.cn
Tel./Fax: +86 3517018379, fax: +86 3517018379
* Co-correspondence to Prof. Xuemei Qin
E-mail: qinxm@sxu.edu.cn
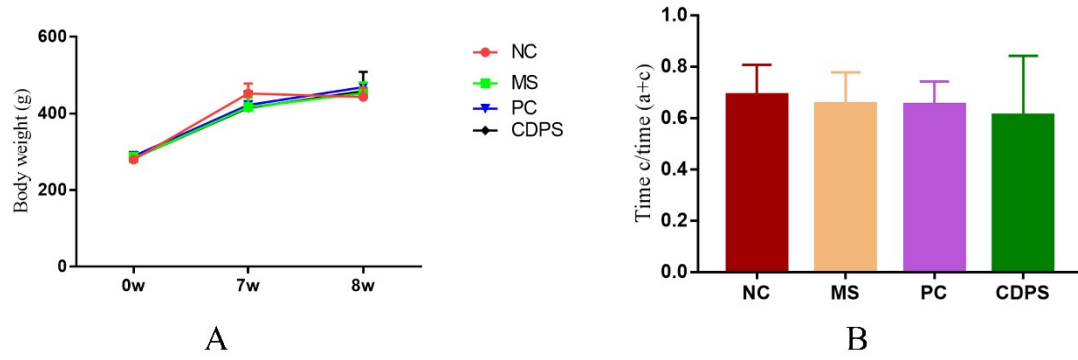Tel./Fax: +86 3517011501, fax: +86 3517011501

Supplementary files

Figure S1. Body weight of rats **(A),** and the time c/time (a + c) ratio of rats in the novel object recognition (NOR) test at 0 week **(B).** NC, the negative control group; MS, the aged constipated group; PC, the Mosapride group; CDPS, the *Cistanche deserticola* Polysaccharides group. $^*p<0.05$, $^{**}p<0.01$, significant differences as compared to the NC group. $^\#p<0.05$, $^{\#\#}p<0.01$, significant differences as compared to the MS group (n=8).
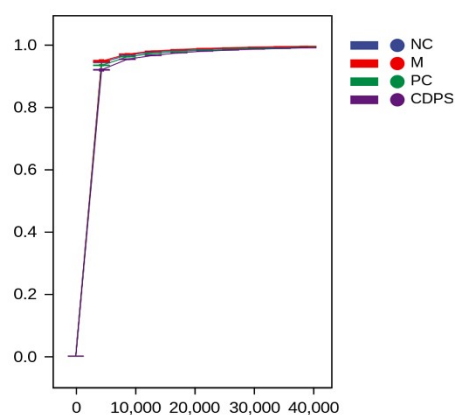
Figure S2. Rarefaction curves **(A)**, the number of species at different levels **(B)** of the rats in the negative control group (**NC**), the aged constipated rats (**MS**), the Mosapride group (**PC**), and the *Cistanche deserticola* Polysaccharides group (**CDPS**).

Figure S3. Score plot of principal component analysis (PCA) **(A)**, partial least-square-discrimination analysis (PLS-DA) **(B)**, orthogonal partial least squares discriminant analysis (OPLS- DA) **(C)** and the model permutation **(D),** and the corresponding S-Plot **(E)** of the aged constipated rats (**MS**) and the *Cistanche deserticola* Polysaccharides group (**CDPS**) (n=8). The PLS-DA model was validated by using 200 random permutations ($R^2 = 0.80$, $Q^2 = 0.66$).
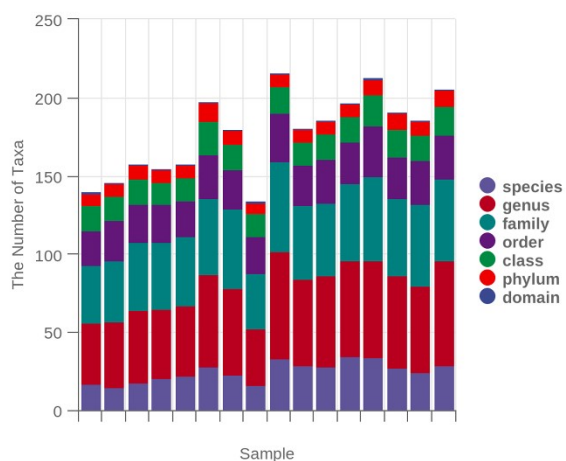
Figure S4. Enrichment analysis of pathways involving in the pathology of the aged constipation (the negative control group **(NC)** versus the aged constipated rats **(MS),** and the effects of *Cistanche deserticola* Polysaccharides group **(CDPS) (**the **MS** group versus the **CDPS** group**)**. Color and size represent p and impact, respectively. Pathways with p <0.05 and impact > 0.1 represent a significant impact of this pathway.

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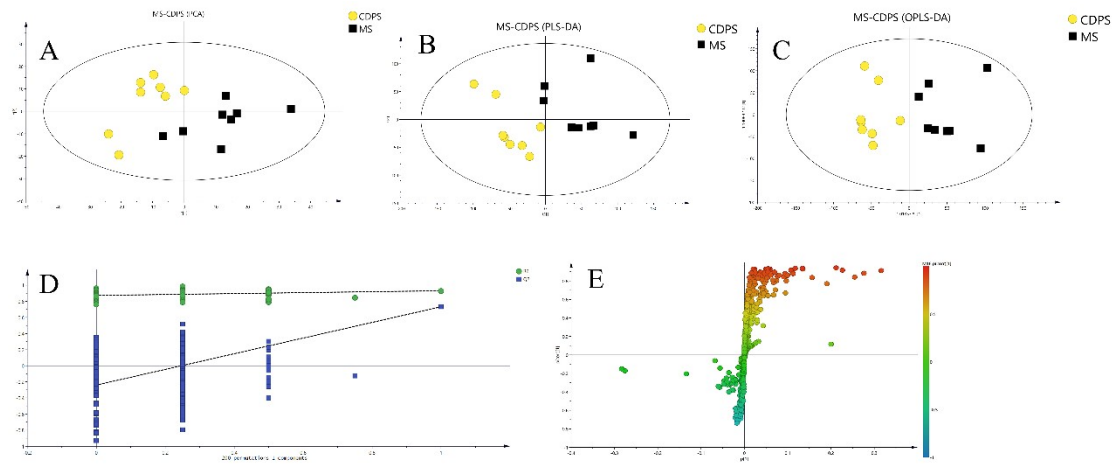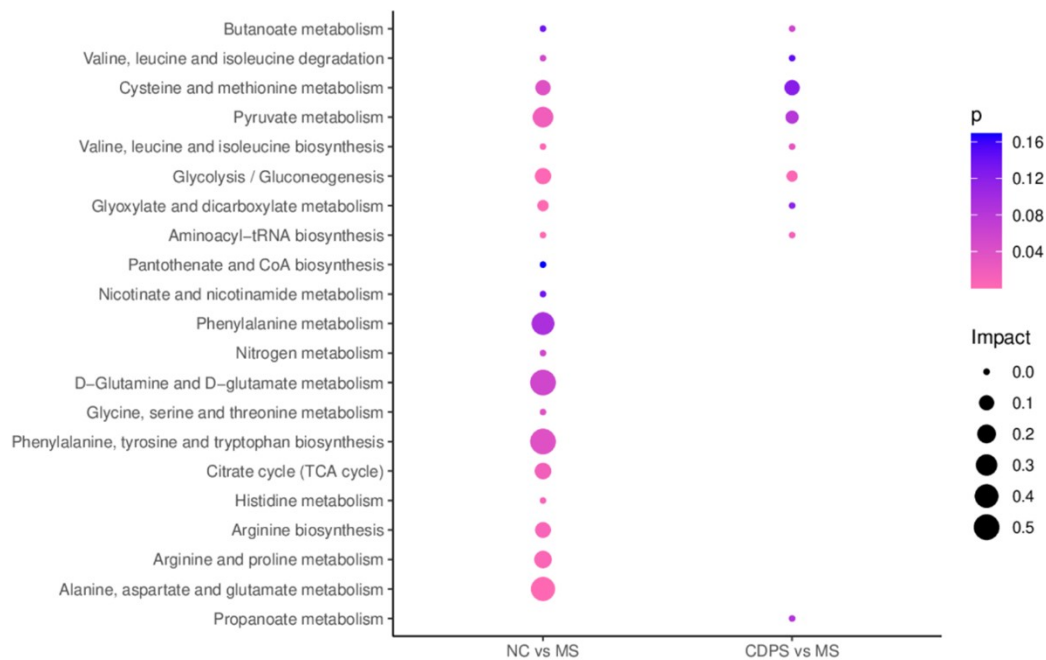
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