Supplementary Material

Selenized Glucose Improves Rat Semen Quality by Improving Gut Microbiota and Serum Metabolome

Huimin Sun, [a] Bo Lv, [ab] Haiqin Zhu, [a] Zhi Zeng, [a] Saeed El-Ashram, [c] Jinjin Li, [a] Yingyin Cao, [a] Juan Wang[a] and Zhi Wang[*a]

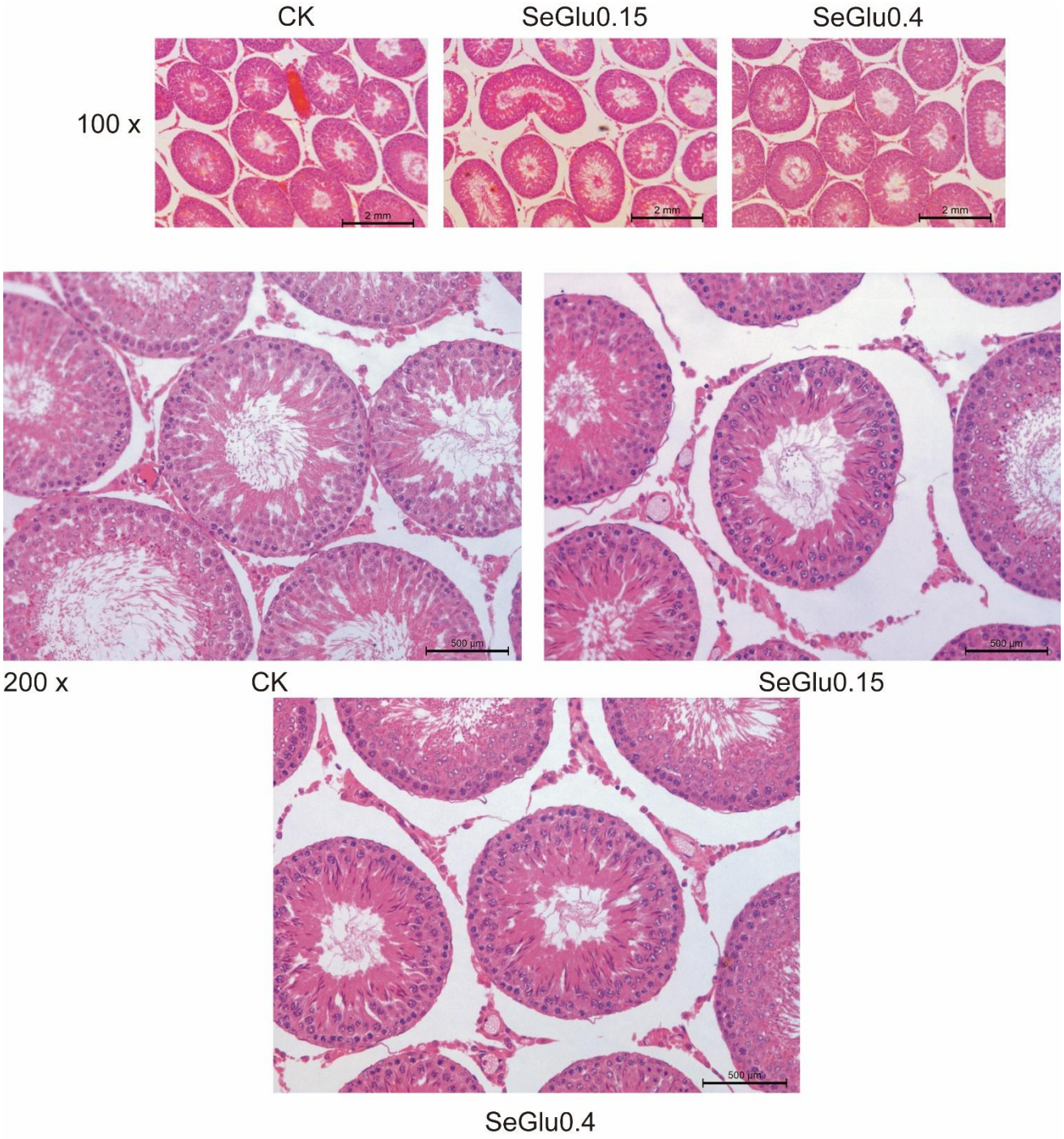
*** Correspondence:** Zhi Wang: E-mail: 17004@hunnu.edu.cn

1 Supplementary Information

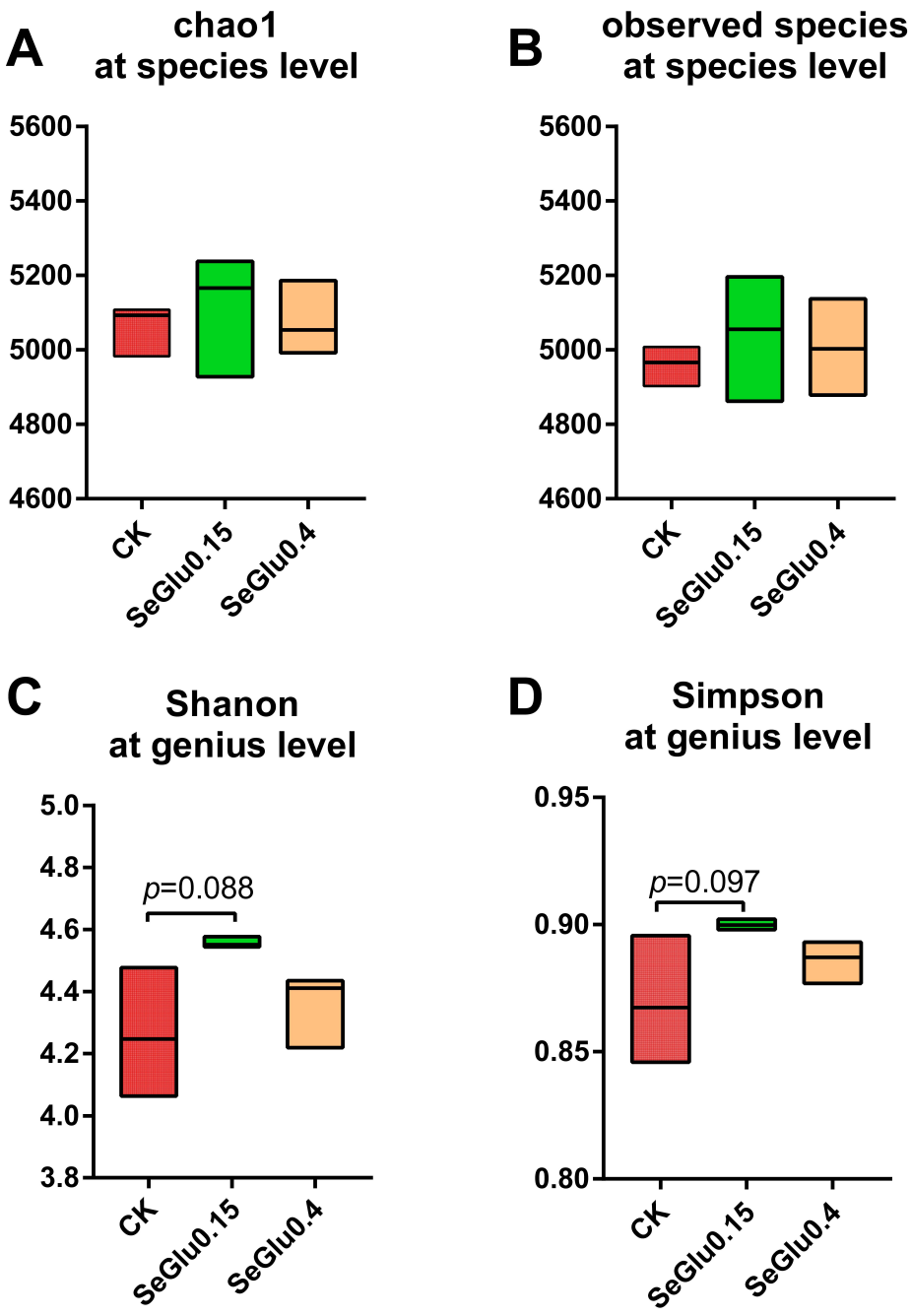
1.1 Preparation Methods of Selenized Glucose (SeGlu)

The formula for selenized glucose has successfully undergone reviewer scrutiny. However, we regret to inform you that the formula cannot be disclosed at this time due to an ongoing patent application. We apologize for any inconvenience caused by the inability to share the details of the formulation.We appreciate your understanding and assure you that once the patent is secured, we will share the details with you.

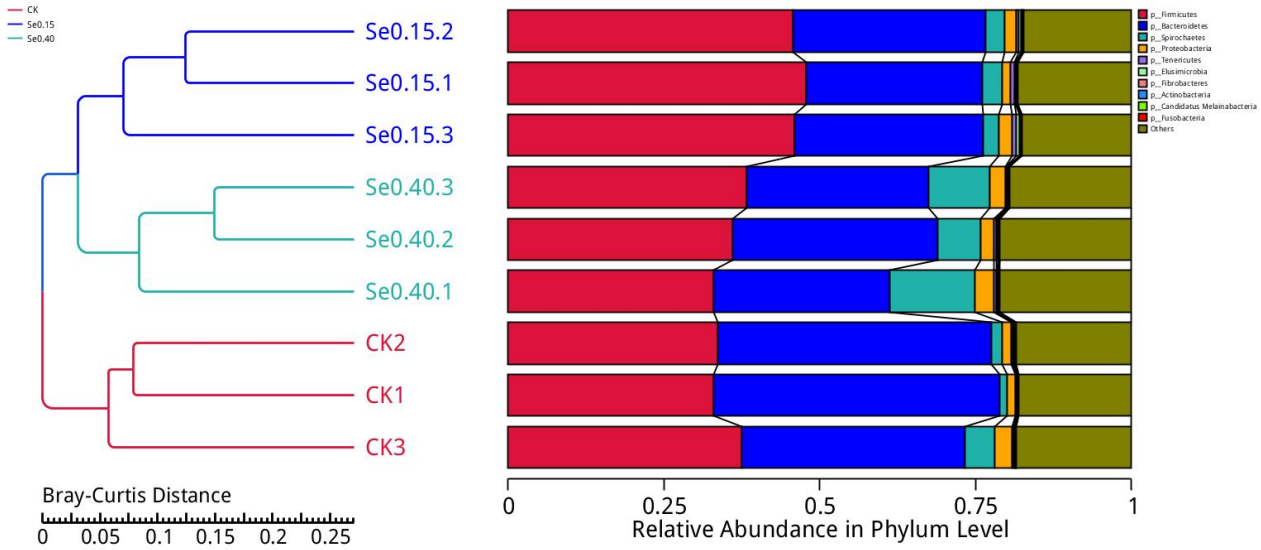
2 Supplementary Figures



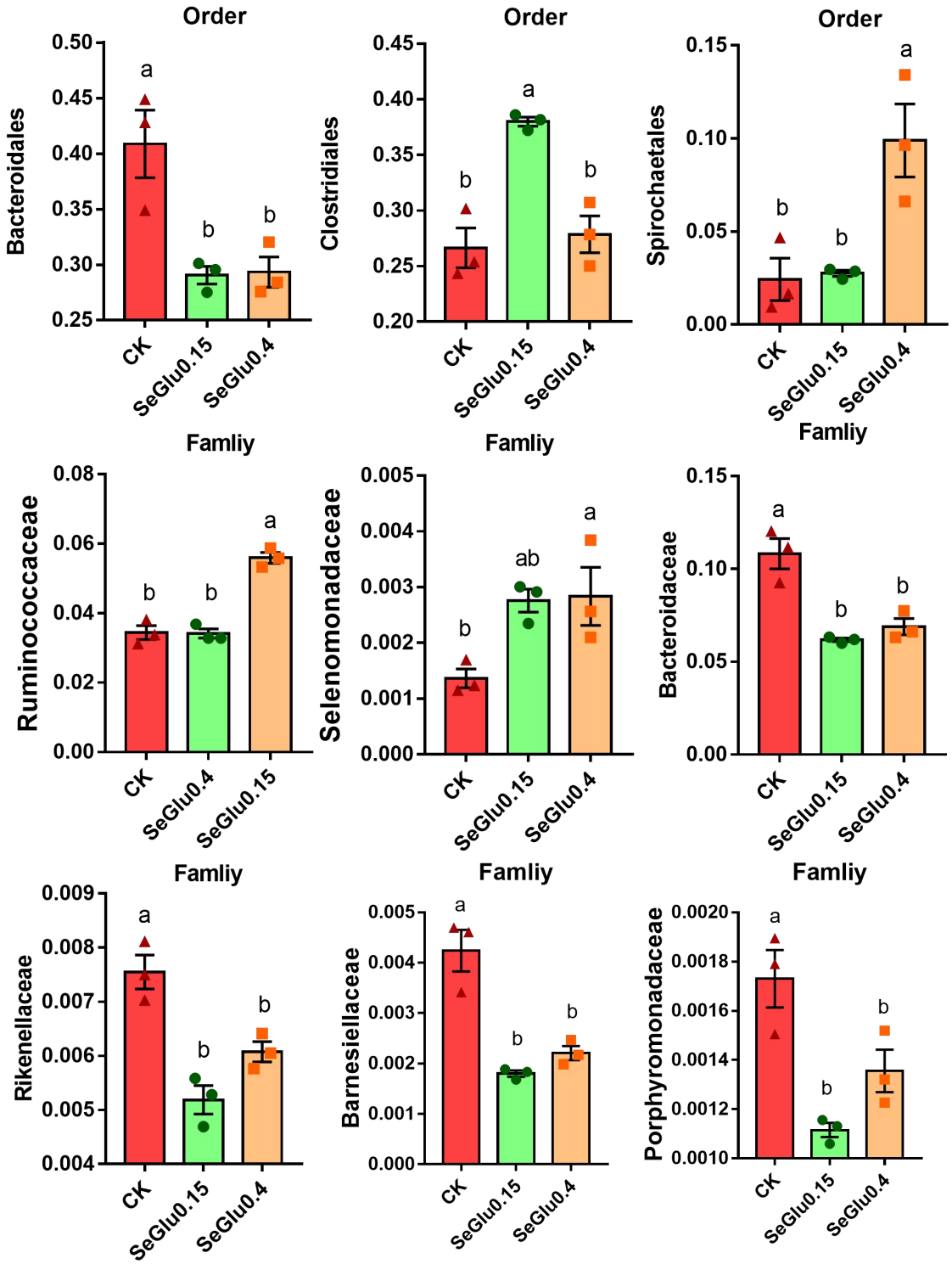
Supplementary Figure 1. Histopathological observation of rat testes under low magnification and high magnification, respectively



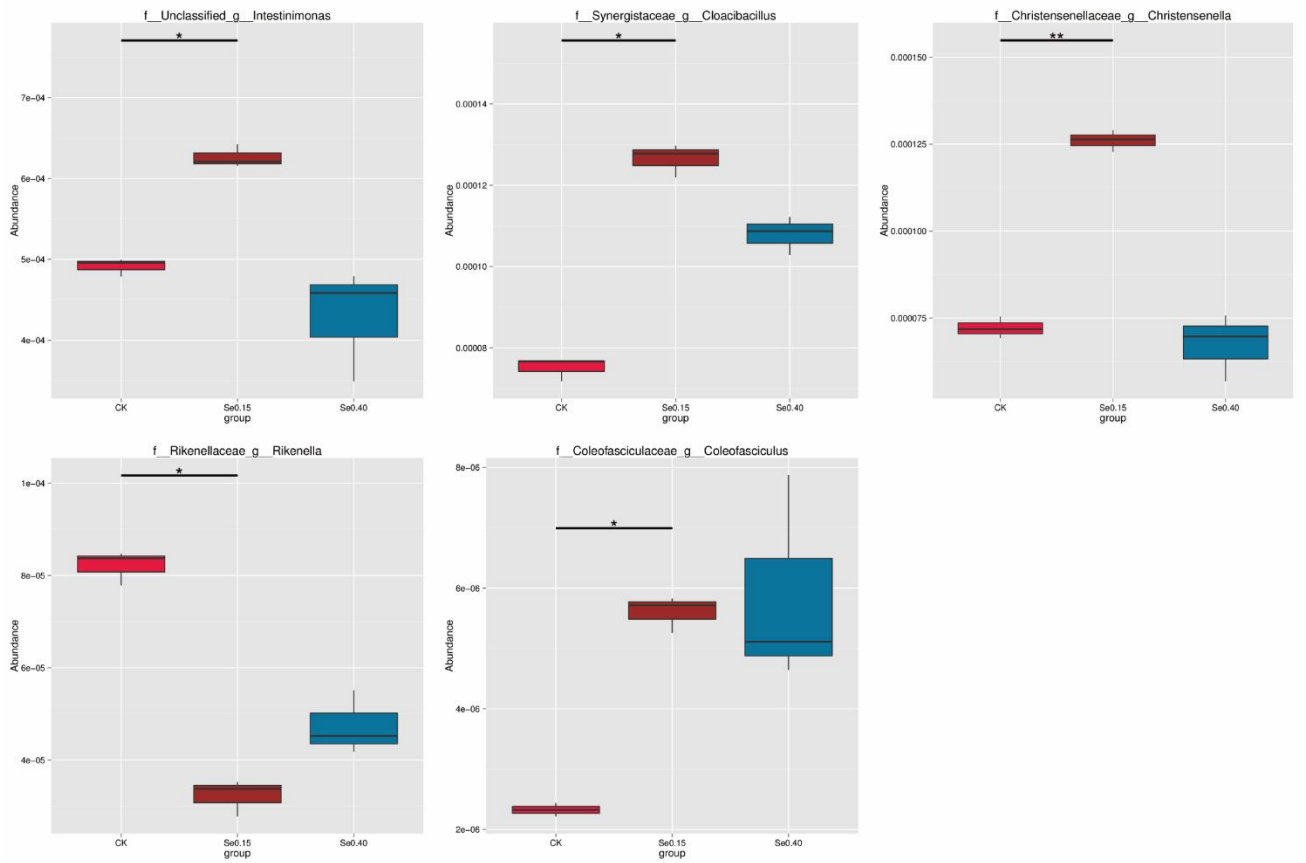
Supplementary Figure 2. (A-B) Chao1 and observed species indices at the species level. (C-D) Shannon and Simpson indices at the genus level.



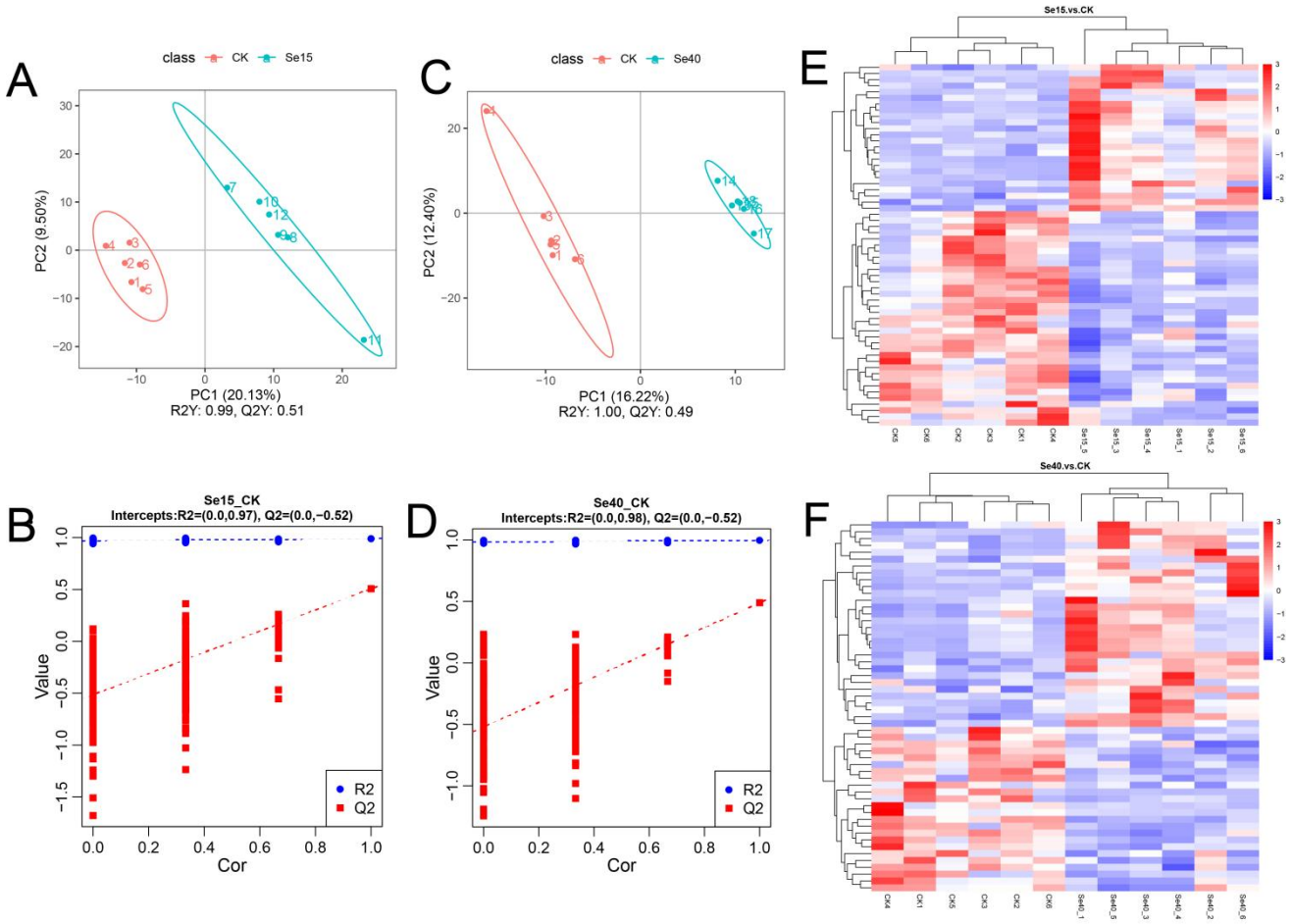
Supplementary Figure 3. Relative abundance of the top 10 and the other gut microbiota and the hierarchical clustering analysis based on Bray-Curtis distance at the phylum level.



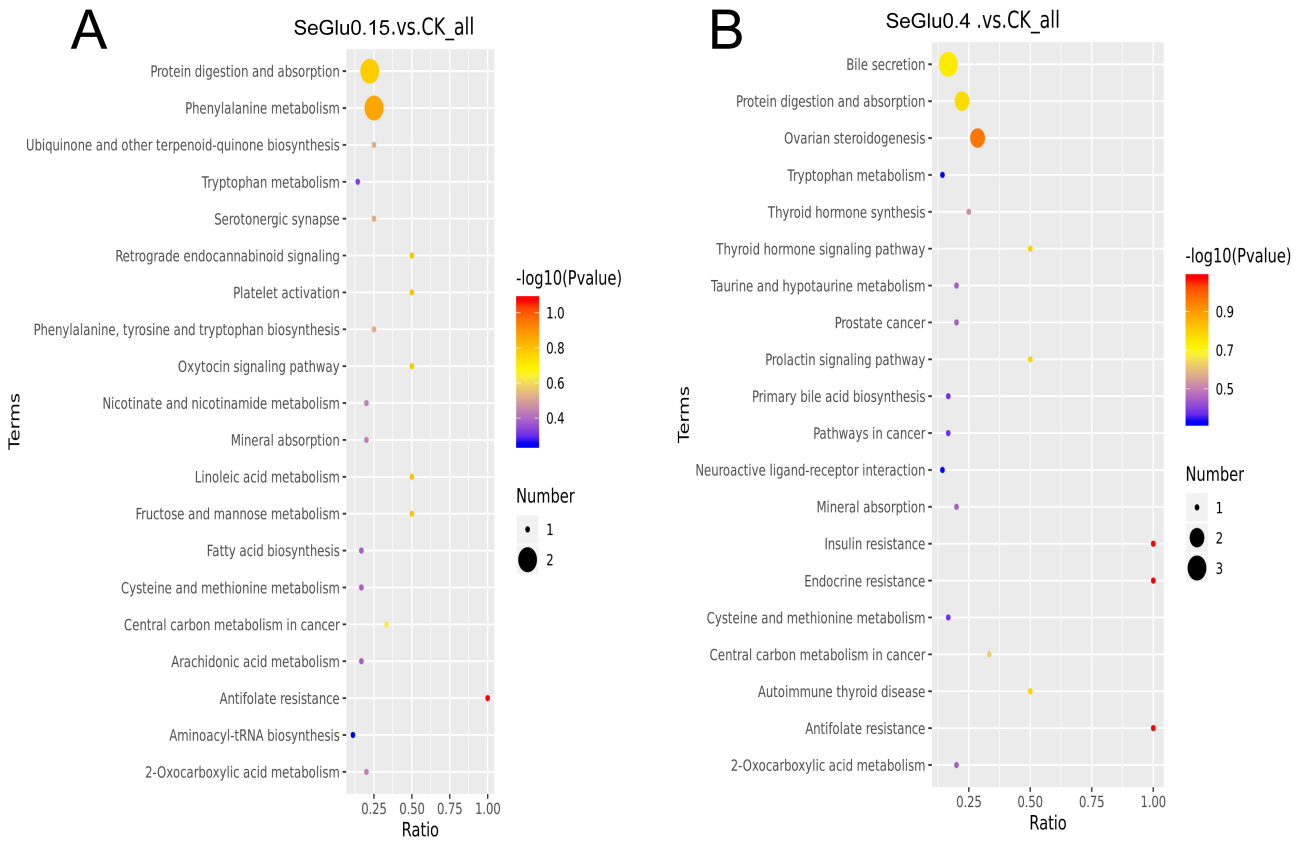
Supplementary Figure 4. Relative abundance of gut microbiota differed significantly between the two Se-treated groups and the control group at the order and family levels.



Supplementary Figure 5. Use Metastat to identify differentially abundant features at the genus level. * indicating $q < 0.05$ and ** indicating $q < 0.01$.



Supplementary Figure 6. Partial least square-discriminate analysis (PLS-DA) of the serum metabolome in the combination of the electrospray ionization (+) and (-) modes between experiment and control groups (A-C). Permutation test for PLS-DA (B-D). Heatmap shows the significant up- or down-abundant of serum metabolite driven by SeGlu supplementation in the combination of the electrospray ionization(+) and (-) modes (E-F).



Supplementary Figure 7. the KEGG enrichment pathways involved in those two comparative combinations.