Supporting Information

Sr-, Ca-Doped $BaTiO_3$ with Synergistic Piezoelectric Catalysis and Microbial Balance Effects Enables Tooth Whitening for Home Oral Health

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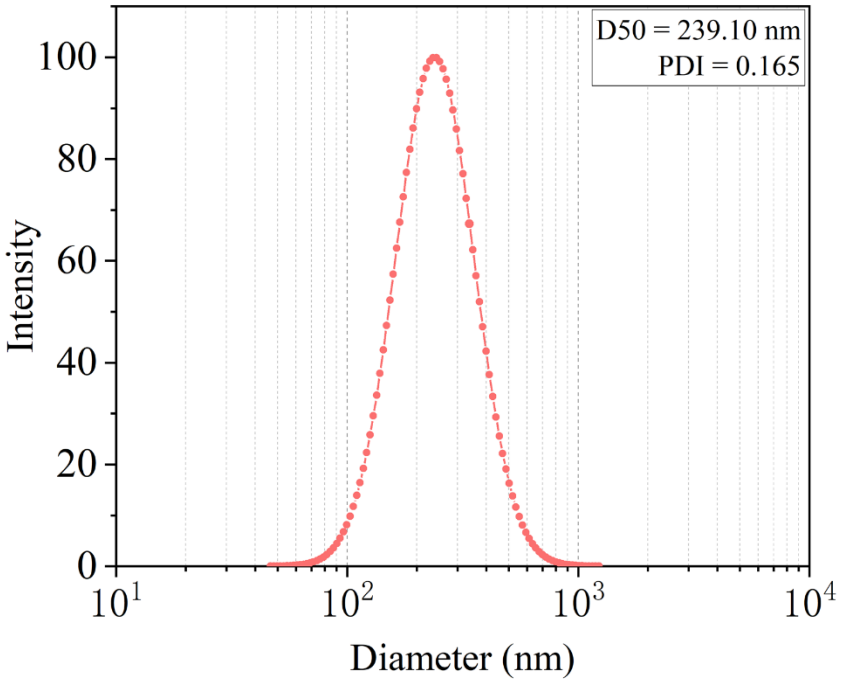

Figure S1. Particle size distribution of BSCT powder.

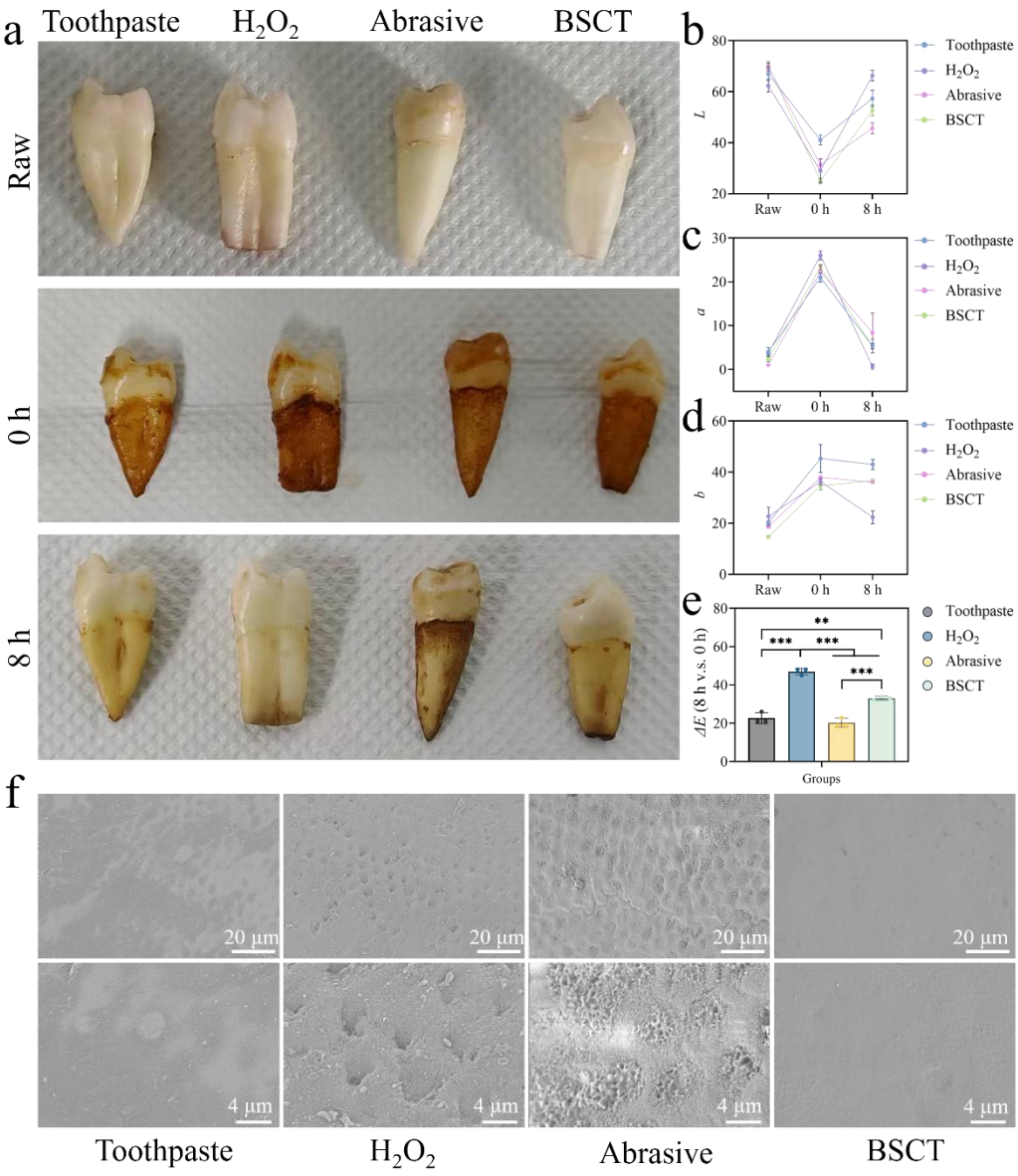

Figure S2. (a) Optical photos of teeth under different conditions of tooth cleaning. Records of luminance L (b), color value of red-green axis *a* (c), color value of blue-yellow axis *b* (d) and color difference *ΔE* (e). (f) SEM surface morphology of dental crowns under different conditions of tooth whitening.

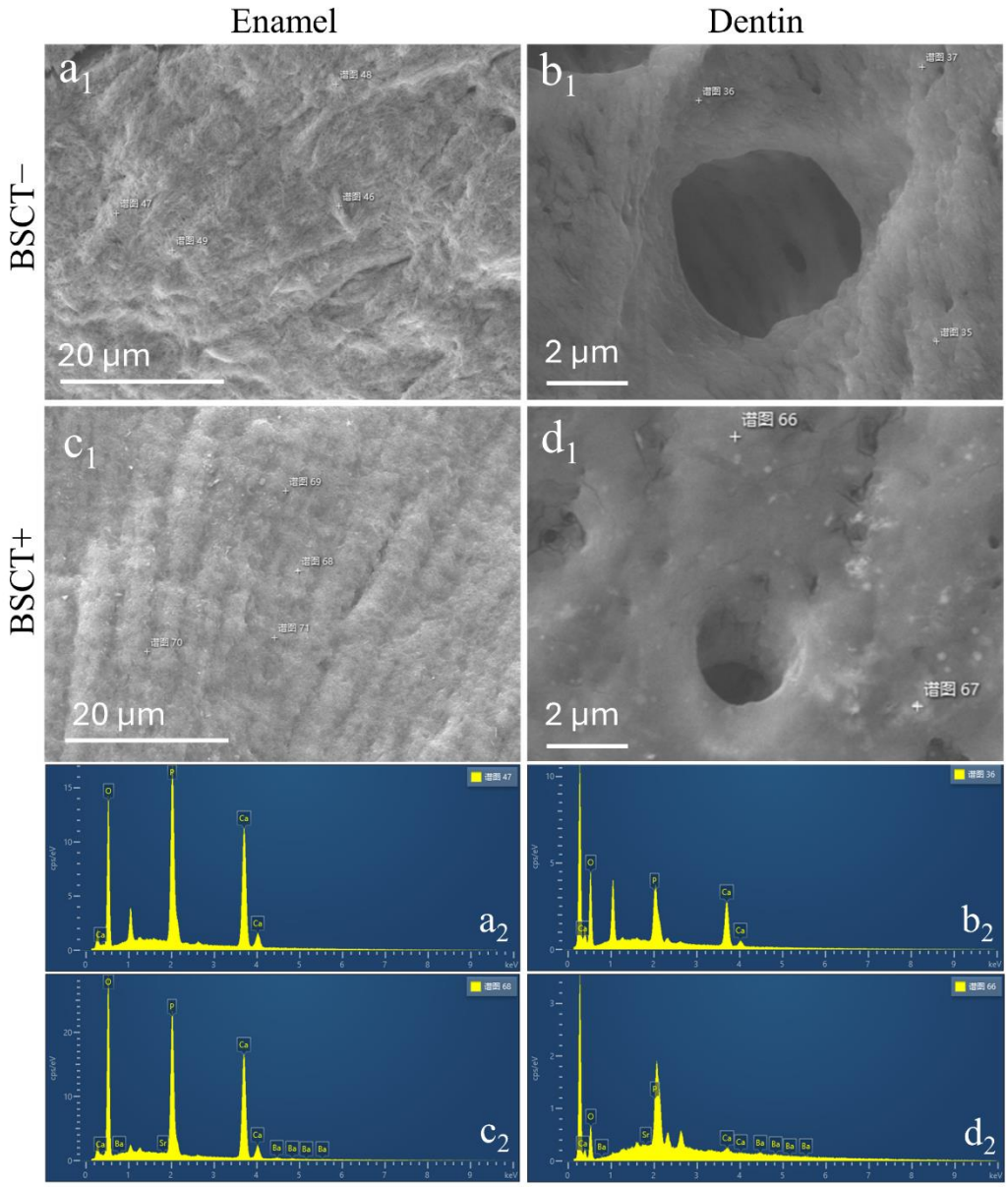

Figure S3. The scanning electron spectroscopy images of the enamel surface for BSCT- (a_1) and BSCT+ (c_1), along with the corresponding EDS analyses for BSCT- (a_2) and BSCT+ (c_2); The scanning electron spectroscopy images of the dentin surface for BSCT- (b_1) and BSCT+ (d_1), along with the corresponding EDS analyses for BSCT- (b_2) and BSCT+ (d_2).

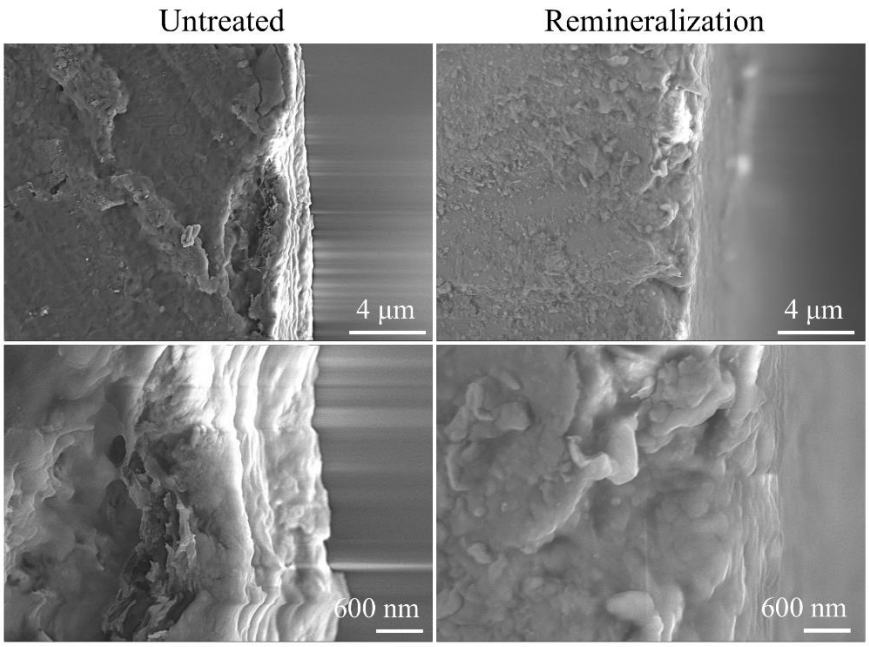

Figure S4. SEM cross-sectional images of enamel in a normal tooth (left) and a remineralized tooth (right) at different magnification.

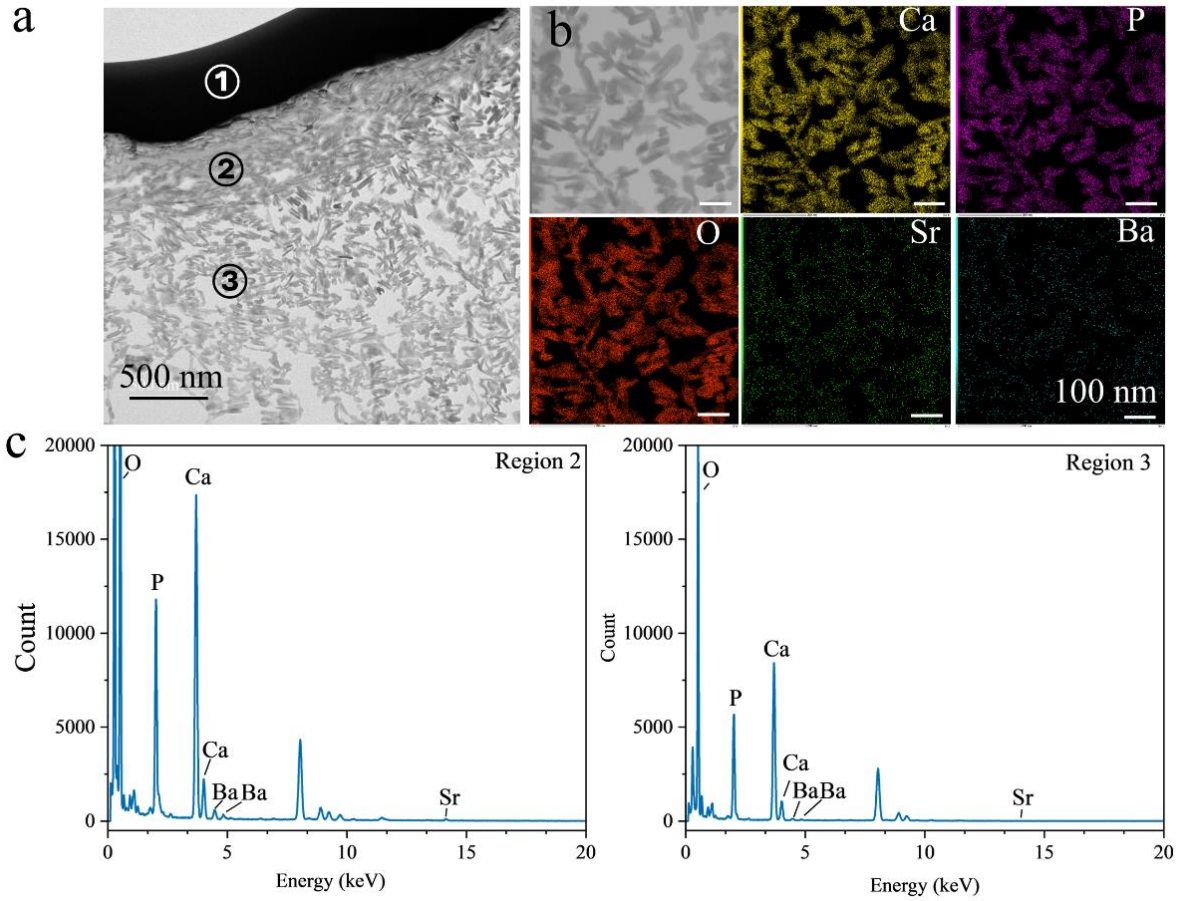

Figure S5. (a) TEM images of cross-section, (b) enlarged image of region 2 in image a and corresponding elemental distribution mapping. Region 1 refers to protective layer sputtered during sample preparation using focused ion beam technique, region 2 indicates newly formed mineralization layer, region 3 denotes original mineralization layer after demineralization treatment. (c) EDS spectra of region 2 and region 3 in image a.

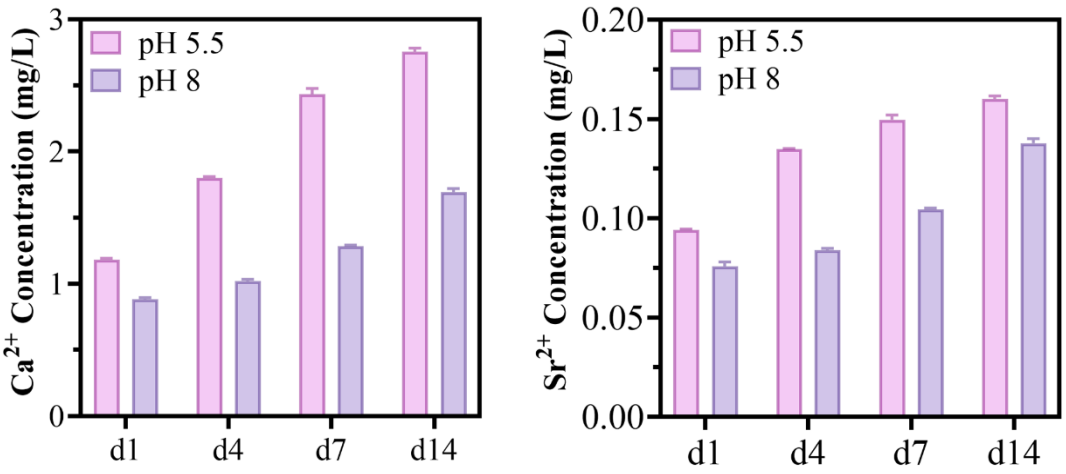

Figure S6. The ion release concentration of Ca^{2+} and Sr^{2+} from BSCT powders at different pH values of 5.5 and 8.

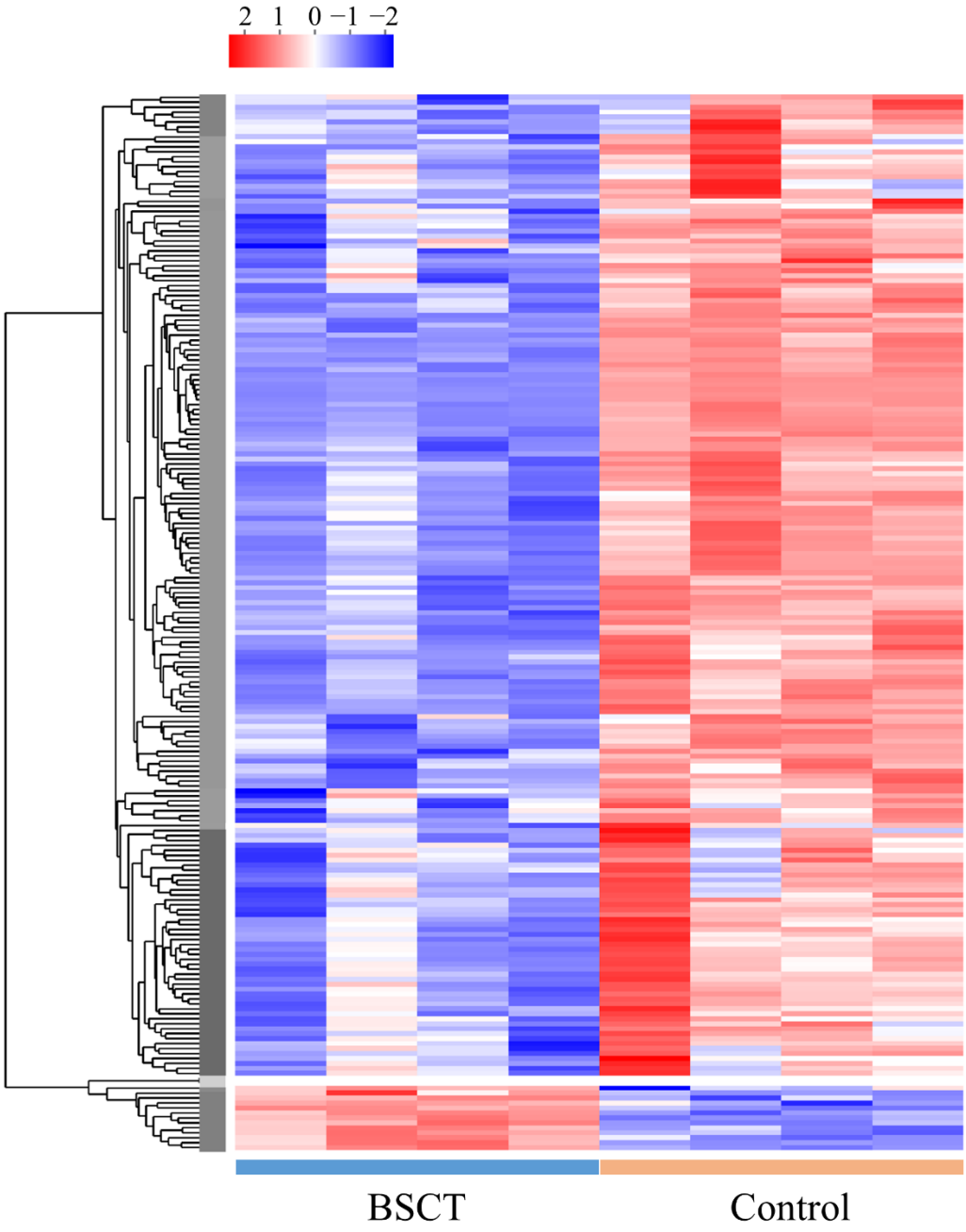

Figure S7. Heatmap of *Staphylococcus aureus* gene expression profiles in BSCT versus Control groups.

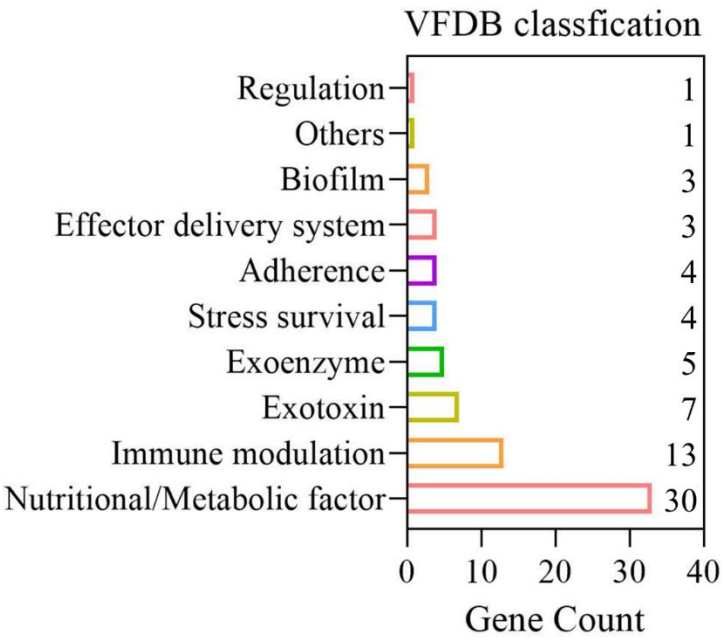

Figure S8. VFDB annotation of downregulated *Staphylococcus aureus* genes in BSCT versus Control groups.

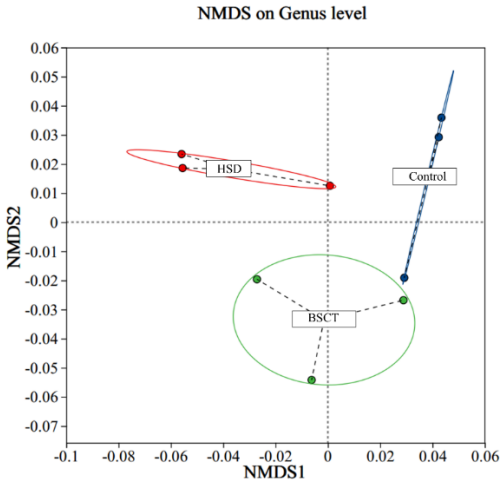

Figure S9. The β-diversity of oral microbiota based on NMDS analysis in different groups.

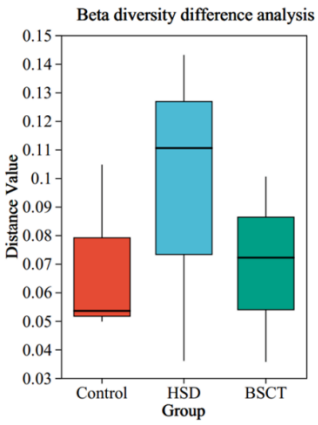

Figure S10. β-Diversity distance values of oral microbiota in different groups.

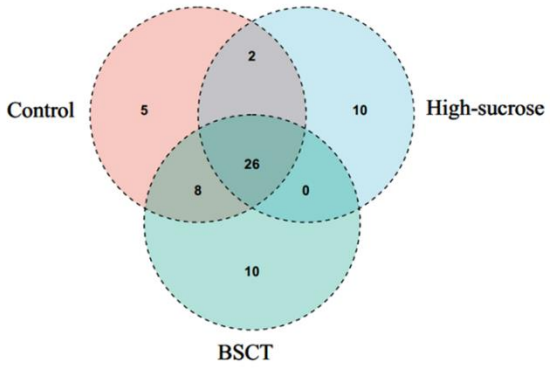

Figure S11. Venn diagram of different groups on genus level.