

Supporting Information

Antioxidant and antibacterial starch edible films composed of eugenol/gelatin microspheres

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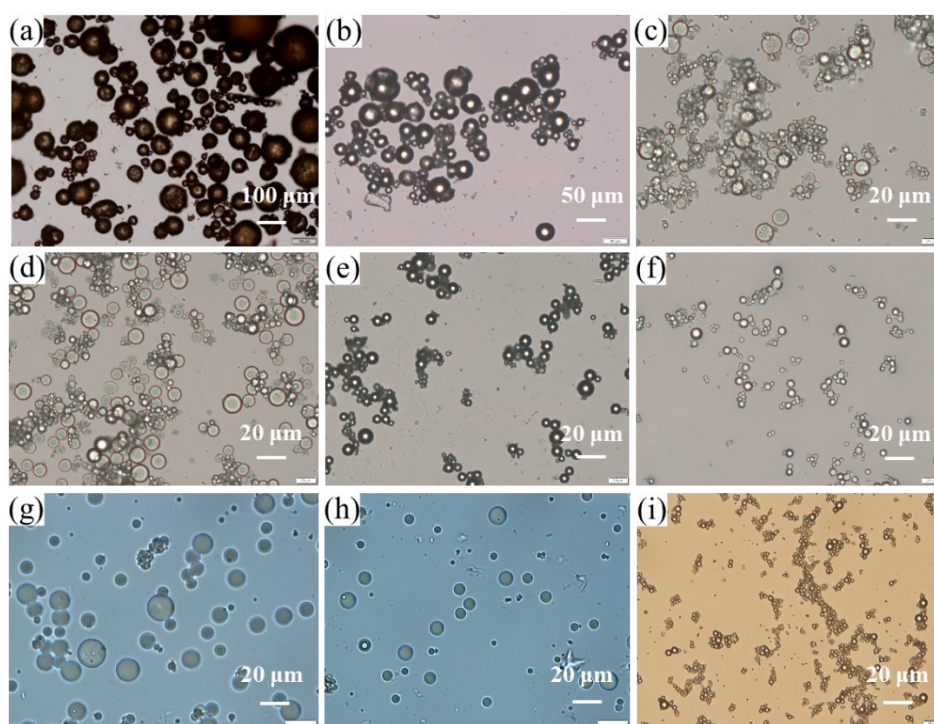


Fig. S1. Gelatin microspheres synthesized under conditions of (a) gelatin concentration of 20%, Span-80 amount of 2%, water to oil ratio of 1:5, glutaraldehyde amount of 2%; (b) gelatin concentration of 15%, Span-80 amount of 2%, water to oil ratio of 1:5, glutaraldehyde amount of 2%; (c) gelatin concentration of 10%, Span-80 amount of 4%, water to oil ratio of 1:5, glutaraldehyde amount of 2%; (d) gelatin concentration of 10%, Span-80 amount of 6%, water to oil ratio of 1:5, glutaraldehyde amount of 2%; (e) gelatin concentration of 10%, Span-80 amount of 2%, water to oil ratio of 1:10, glutaraldehyde amount of 2%; (f) gelatin concentration of 10%, Span-80 amount of 2%, water to oil ratio of 1:15, glutaraldehyde amount of 2%; (g) gelatin concentration of 10%, Span-80 amount of 2%, water to oil ratio of 1:5, glutaraldehyde amount of 6%; (h) gelatin concentration of 10%, Span-80 amount of 2%, water to oil ratio of 1:5, glutaraldehyde amount of 4%; (i) gelatin concentration of 10%, Span-80 amount of 2%, water to oil ratio of 1:5, glutaraldehyde amount of 2%.

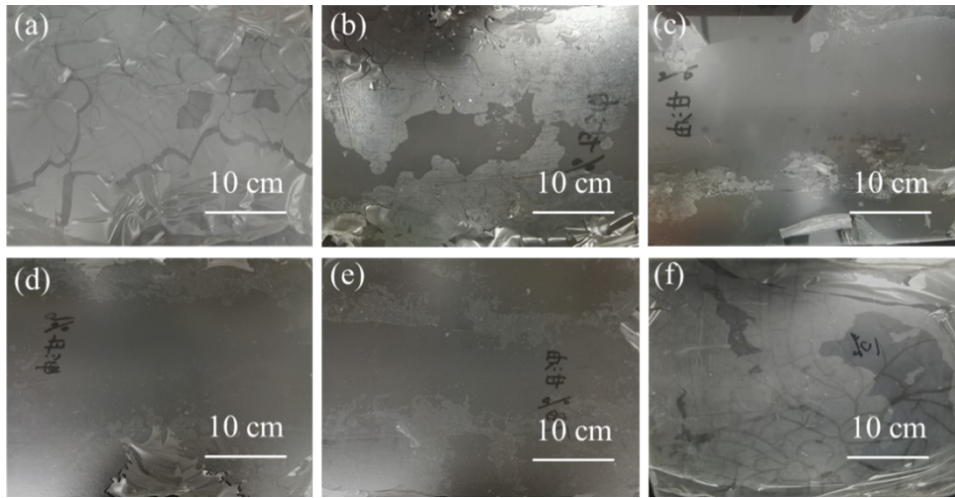


Fig. S2. Digital pictures of starch film (corn starch to cassava starch=1:0) with (a) 0% glycerol, (b) 1% glycerol, (c) 3% glycerol, (d) 5% glycerol, (e) 7% glycerol, and (f) 10% glycerol.

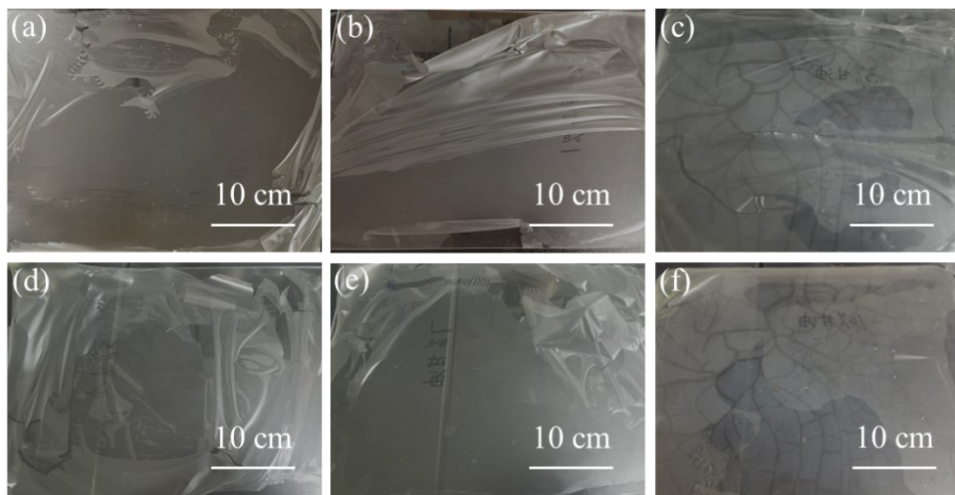


Fig. S3. Digital pictures of starch film (corn starch: cassava starch=1:1) with (a) 0% glycerol, (b) 1% glycerol, (c) 3% glycerol, (d) 5% glycerol, (e) 7% glycerol, and (f) 10% glycerol.

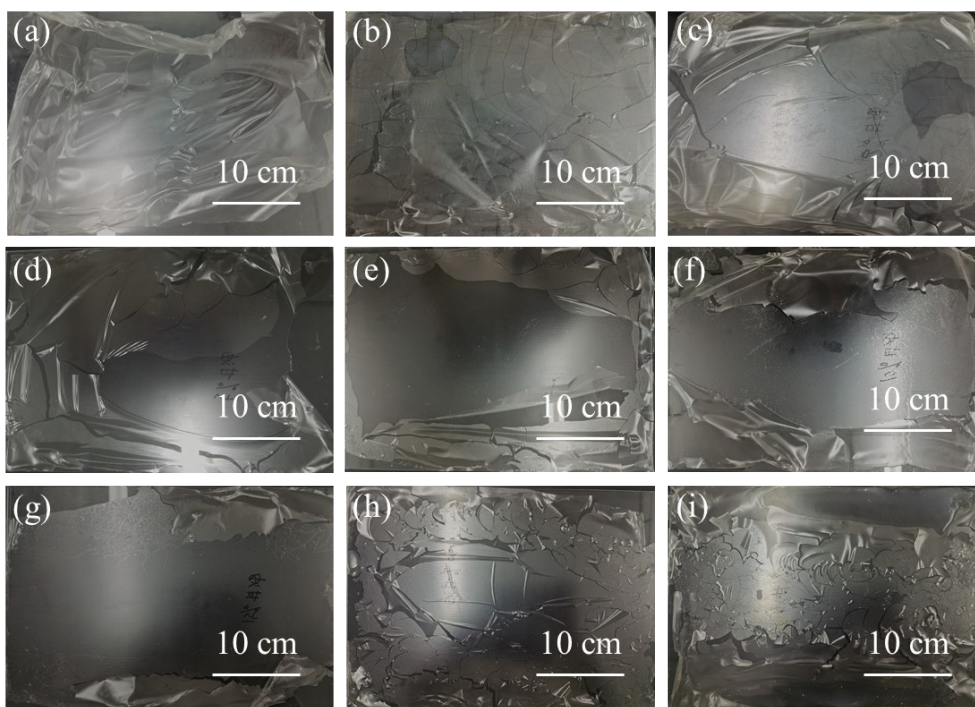


Fig. S4. Digital pictures of starch film (corn starch: cassava starch=1:2) with (a) 0% glycerol, (b) 1% glycerol, (c) 3% glycerol, (d) 5% glycerol, (e) 7% glycerol, (f) 10% glycerol, (g) 15% glycerol, (h) 20% glycerol, and (i) 30% glycerol.

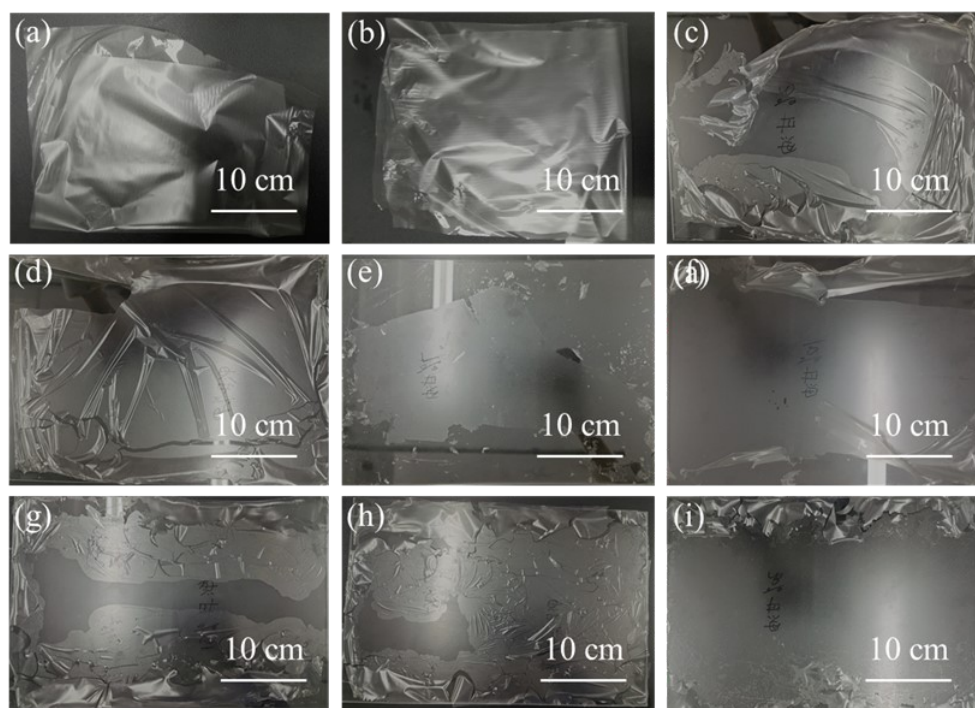


Fig. S5. Digital pictures of starch film (corn starch: cassava starch=1:4) with (a) 0% glycerol, (b) 1% glycerol, (c) 3% glycerol, (d) 5% glycerol, (e) 7% glycerol and (f) 10% glycerol, (g) 15% glycerol, (h) 20% glycerol, and (i) 30% glycerol.

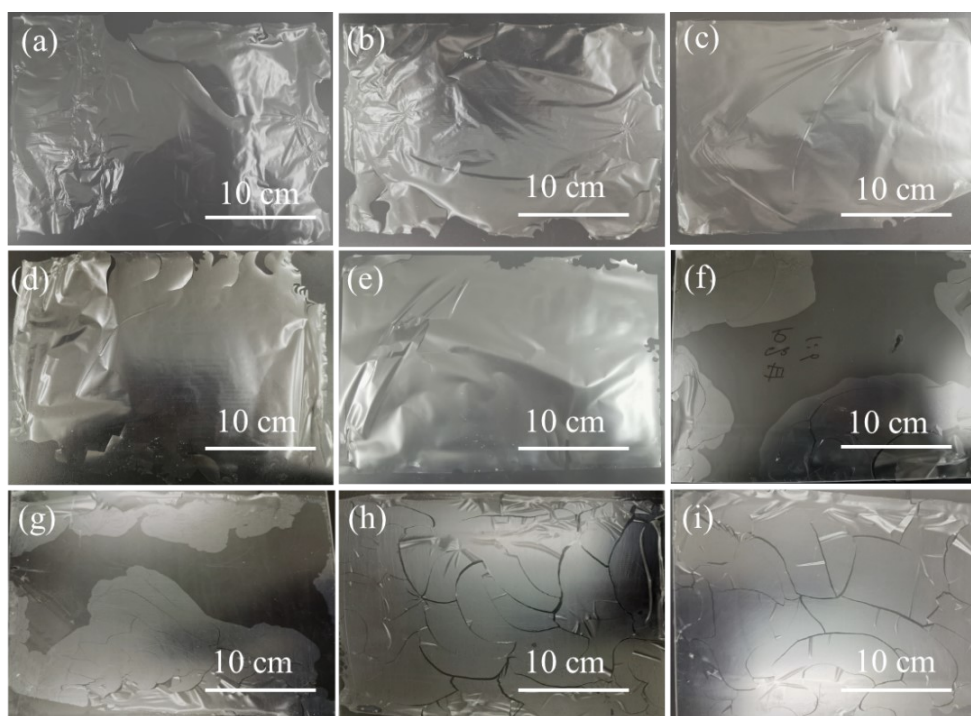


Fig. S6. Digital pictures of starch film (corn starch: cassava starch=1:6) with (a) 0% glycerol, (b) 1% glycerol, (c) 3% glycerol, (d) 5% glycerol, (e) 7% glycerol and (f) 10% glycerol, (g) 15% glycerol, (h) 20% glycerol, and (i) 30% glycerol.

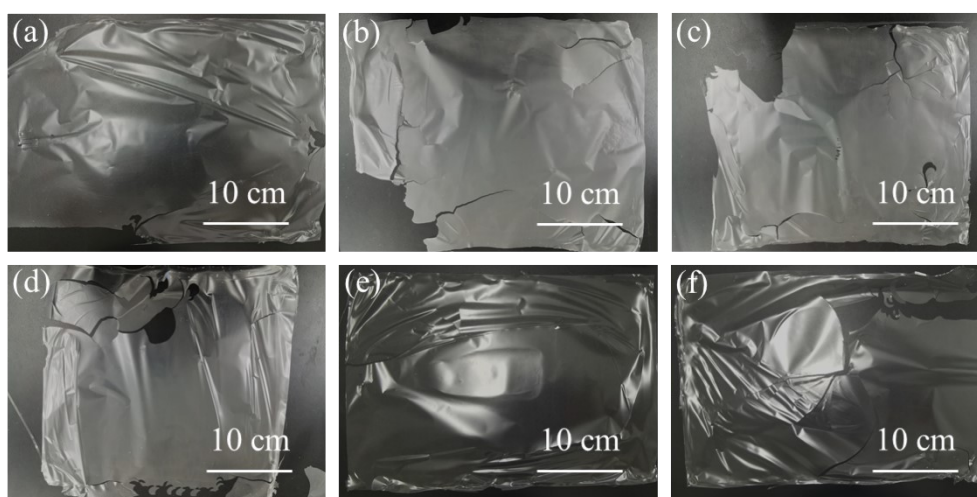


Fig. S7. Digital pictures of starch film (corn starch: cassava starch=0:1) with (a) 0% glycerol, (b) 1% glycerol, (c) 3% glycerol, (d) 5% glycerol, (e) 7% glycerol and (f) 10% glycerol.

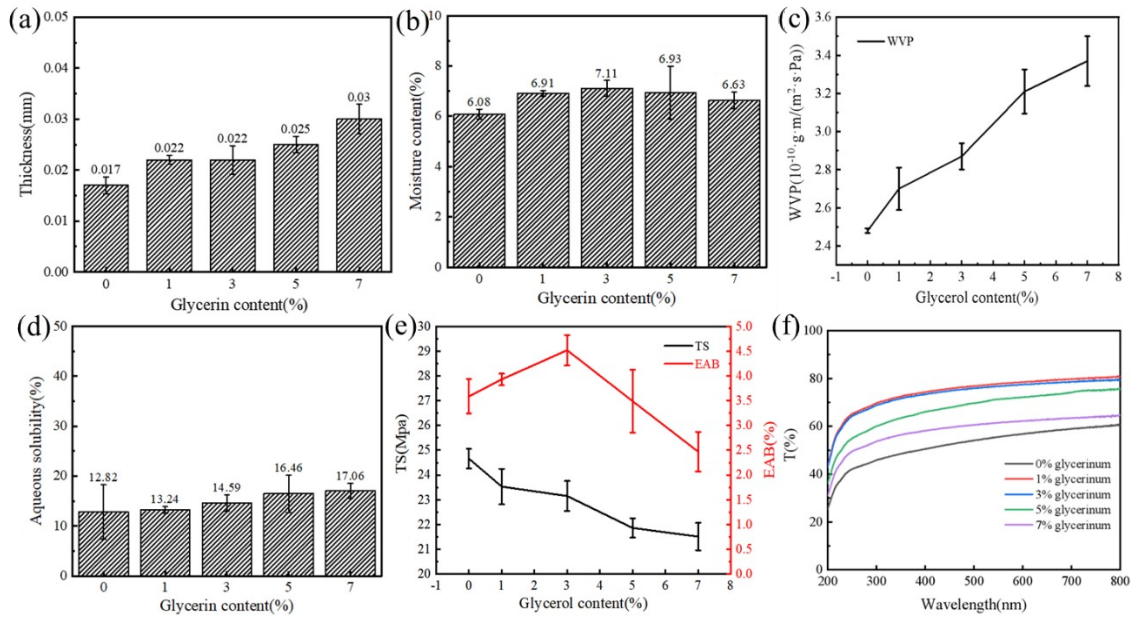


Fig. S8. (a) Thickness, (b) moisture content, (c) water vapor permeability, (d) water solubility, (e) tensile strength and elongation at break, and (f) light transmittance of different samples.

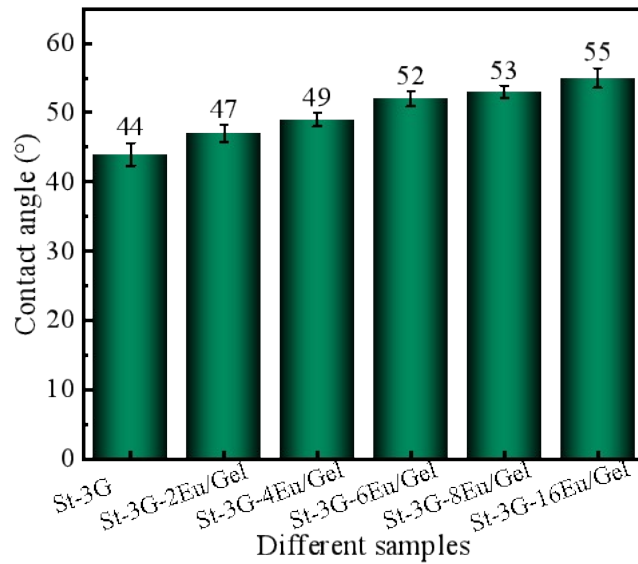


Fig. S9. Contact angle with different samples.

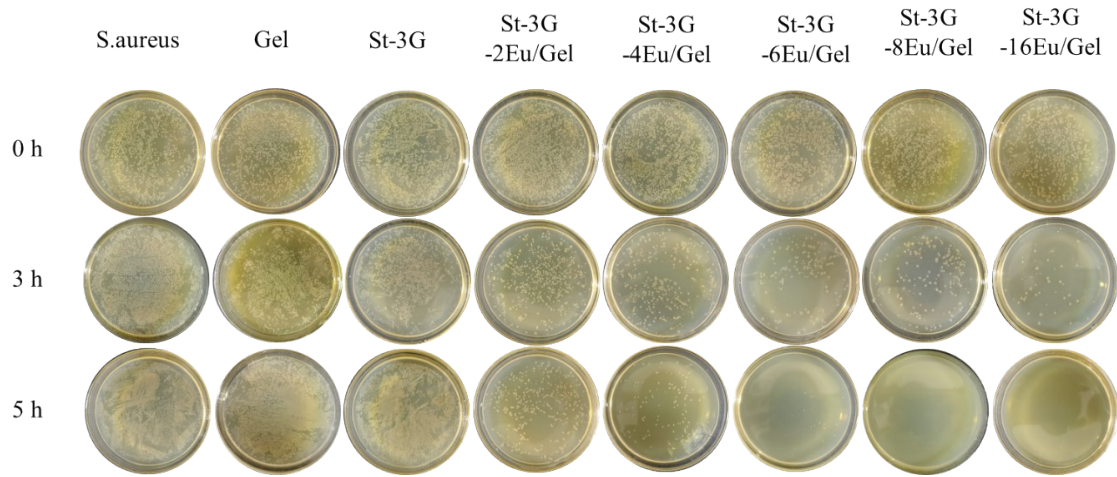


Fig. S10. Digital photos of viable *S. aureus* colonies after incubating with different samples.

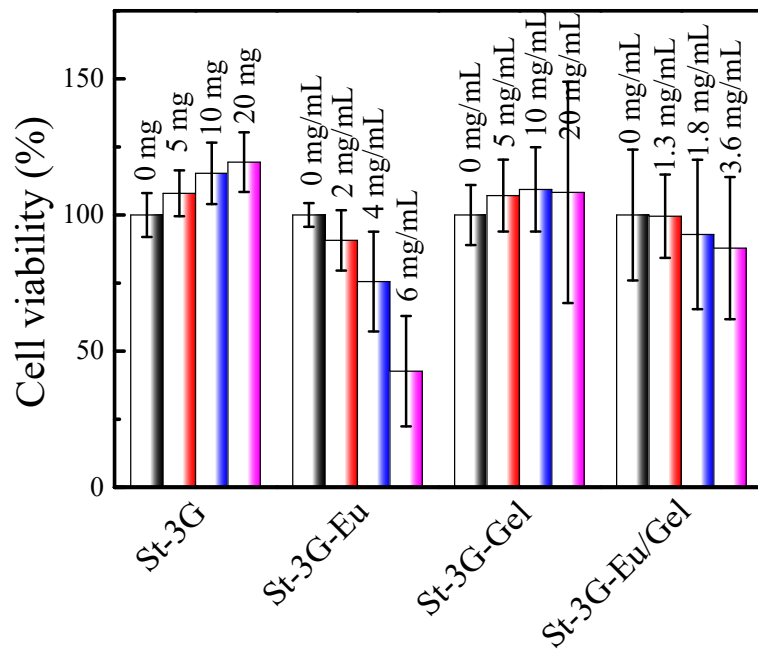


Fig. S11. Cell viability in different samples.