

## **Supplementary Materials and Methods**

**Preparation of TPE.** The thyme leaves were dried at 40°C, ground into powder and sifted through an 80 mesh, then vacuum-packed and stored at room temperature under-ventilated and drying conditions for further use. Thyme powders were subjected to a mixture of ethanol, water, and acetic acid (60:40:1%, v/v) with a solid/liquid ratio of 1:35. The mixture was then incubated in a constant temperature oscillation incubator (Changzhou, China, Changzhou Guohua Electric Appliance Co., Ltd) at 25°C for 2 h followed by sonication for 1 hour at 40°C. The suspensions were filtered and centrifuged (6 000g, 4°C, 10 min). Solvent was then re-moved from the supernatant using a rotary evaporator. DM-301 macroporous resin (Xi'an, China, Xi'an Jingbo Biotechnology Co., Ltd) was used for the purification of TPE. The obtained extract was freeze-dried into powder and then stored at -40°C until use.