Supplementary Information

Regulatory mechanisms of phytotoxicity and corona formation on sprouts by differently charged and sized polystyrene micro/nano-plastics

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Text S1 Material characterizations

For n-PS MPs/NPs, distinctive absorption bands of the spectra at wave numbers 2847 cm^{-1}, 1664 cm^{-1}, 1492 cm^{-1} and 694 cm^{-1} represented the C–H stretching, C=O stretching, aromatic ring stretching and aromatic C–H out-of-plane bending. In addition, characteristic absorption bands at 1027 cm^{-1} and 694 cm^{-1} reflected aromatic C–H bending and aromatic C–H out-of-plane bending for p-0.1 μm-PS particles.

Text S2 The electrolyte leakage test

The electrolyte leakage rate (ELR) was determined by the conductivity method and expressed as relative conductivity. The plant roots (0.1 g) were cut into 1 cm pieces and placed in a test tube of 25 mL ultrapure water, and the conductivity was measured after 24 h. The tube was then capped with sealing plugs with small holes, and conductivity was measured again after 30 min in a boiling water bath.

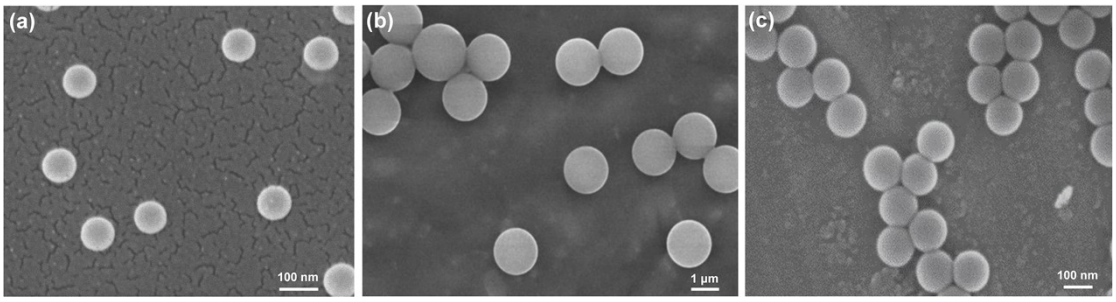


Fig. S1 The SEM images of (a) n-0.1 μm-PS, (b) n-2 μm-PS, and (c) p-0.1 μm-PS MPs/NPs.

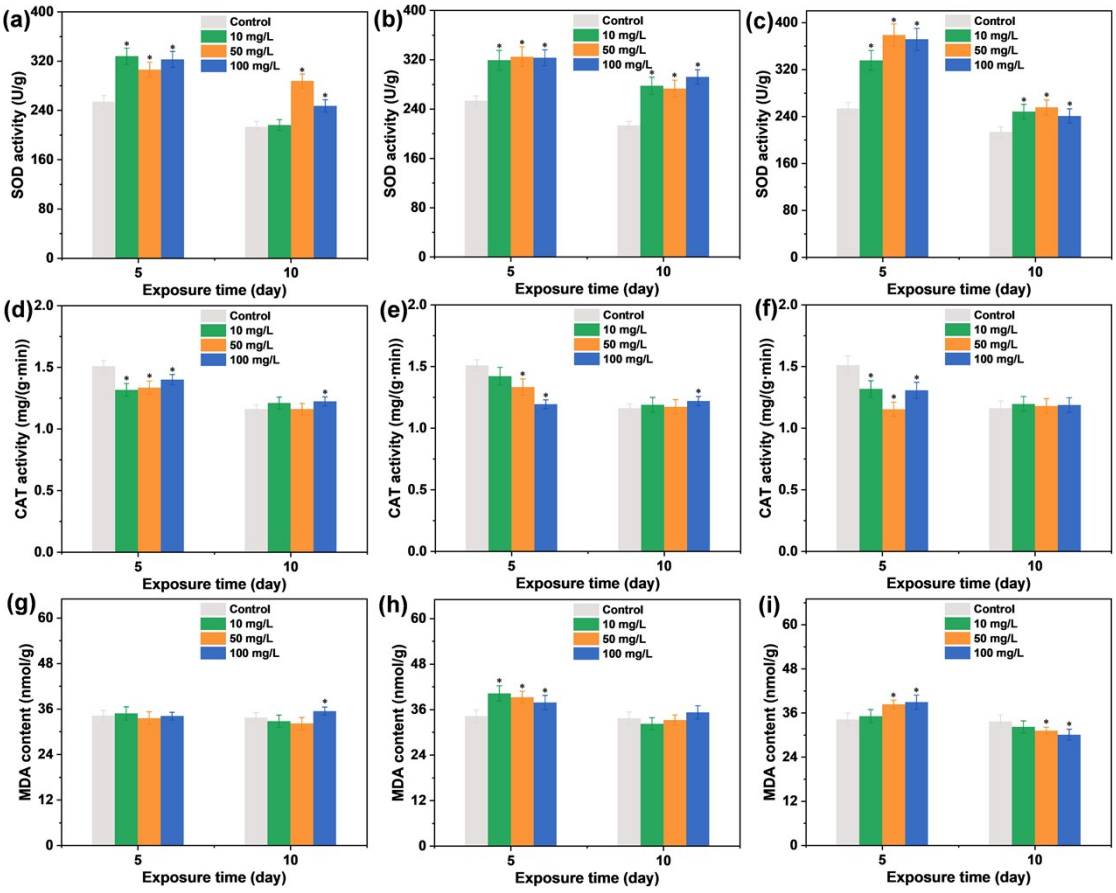
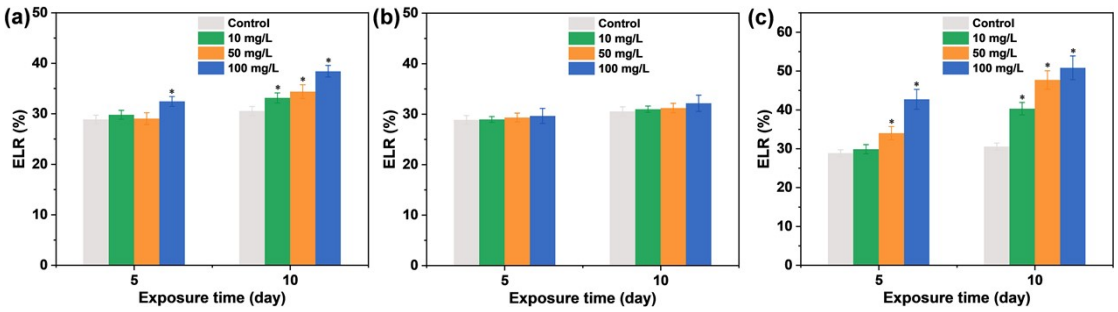


Fig. S2 The activity of (a-c) SOD, (d-f) CAT, and the content of (g-i) MDA in shoots under (a, d and g) n-0.1 μm-PS, (b, e and h) n-2 μm-PS, and (c, f and i) p-0.1 μm-PS treatments. * indicates a significant difference from the control ($p < 0.05$).

21 

22 **Fig. S3** The ELR in roots under (a) n-0.1 μm-PS, (b) n-2 μm-PS, and (c) p-0.1 μm-PS treatments

23 for 5 and 10 days. * indicates a significant difference from the control ($p < 0.05$).