We collected ~20 L and 2 L of surface lake water containing phytoplankton from mesotrophic Otsego Lake, New York, USA, on 6 and 13 July 2016, respectively. The pre-incubation sample (20 L) was filtered through a 118 µm mesh to exclude most large grazers before treatment. Three types of microparticles constituted treatments in this experiment: 50 µm diameter polystyrene calibration beads (DC), plant-derived scrub particles from a body wash (CS), and plastic scrub particles from another body wash (DP). Fourier transform infrared (FTIR) analysis by a Frontier FT-IR/NIR spectrometer with a built-in standard reference library (PerkinElmer, USA) was performed on CS and DP for further characterization.

Each treatment was applied at 67 mg L−1 (~30 mg particles per 450 mL pre-incubation ambient lake water per mesocosm) with 4 replicates per treatment. Control mesocosms did not receive any microparticle addition but otherwise were prepared in the same manner as the treatment mesocosms. With the control group, a total of 16 mesocosms were incubated for 7 days. Chlorophyll a (chl. a) was analyzed by filtration onto GF/F filters (nominal pore size: 0.7 µm), followed by extraction by acetone and fluorometry. Sample volumes that were filtered onto the GF/F filters were 150 mL for each experimental replicate and 500 mL for the pre- and post-incubation ambient lake water samples (all were pre-filtered through a 118 µm mesh). All chl. a filters were prepared as soon as possible, within an hour of ambient lake water collection and within two hours of mesocosm takedown, and then kept frozen until the acetone extraction step. Phytoplankton samples from the ambient lake water and experimental mesocosms were preserved with Lugol’s iodine and stored at 4 °C. They were settled in 10 mL Utermöhl chambers overnight before identification and quantification under an inverted light microscope. At 400X, the first 100 identifiable cells (i.e., >5 µm in the largest dimension) were counted along a transect across the bottom of the Utermöhl chamber.