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Di-(2-ethylehxyl) phthalate (DEHP) is the most broadly representative phthalate esters (PAEs) used as a plasticizer and considered an endocrine-disrupting chemical. An e cient DEHP-degrading strain , , YC-YT1, with salt tolerance (0~12% NaCl), is the rst DEHP-degrader isolated from marine plastic debris around coastal saline seawater, which could completely degraded 100 mg/L DEHP within 72 hours. Single factors (pH, temperature, and glucose) analysis and the optimum degradation conditions for the strain were measured by response surface methodology (RSM). According to HPLC-MS analysis, DEHP was transformed by strain YC-YT1 into phthalate (PA) via mono (2-ethylehxyl) phthalate (MEHP), and then PA was used for cell growth. Furthermore, YC-YT1 metabolized initial concentrations of DEHP from 0.5 to 1000 mg/L. Especially, YC-YT1 degraded up to 60% of 0.5 mg/L DEHP. Moreover, compared with previous reports, strain YC-YT1 has the largest substrate spectrum, degrading up to 13 kinds of PAEs as well as diphenyl, PA, benzoic acid, protocatechuic ac (PCA), and 1,2,3,3-tetrachlorobenzene. Strain YC-YT1 could adjust its cell surface hydrophobicity (CSH) in the environment and 79.7~95.9% of DEHP-contaminated soil and water was remedied. ese results demonstrate that strain YC-YT1 has vast potential to bioremediate various DEHP-contaminated environments, especially in saline environments. e whole genome sequence of strain YC-YT1 was obtained by the PacBio sequencing platform and submitted to GenBank (CP023712), whic contained a circular genome and two plasmids. e genes and gene clusters involved in the degradation of PAEs and aromatic