Supplementary Materials

Tuning oxygen limitation for polyhydroxyalkanoate production from alkaline lignin liquor fermentation and comparison with nitrogen limitation

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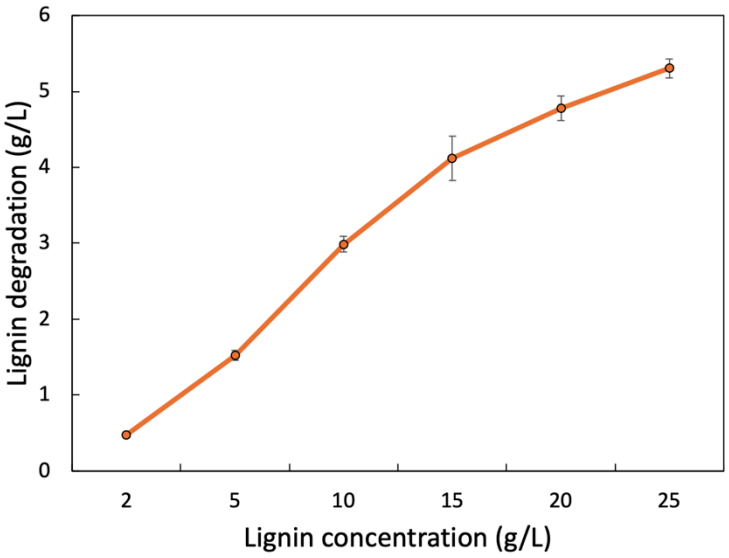
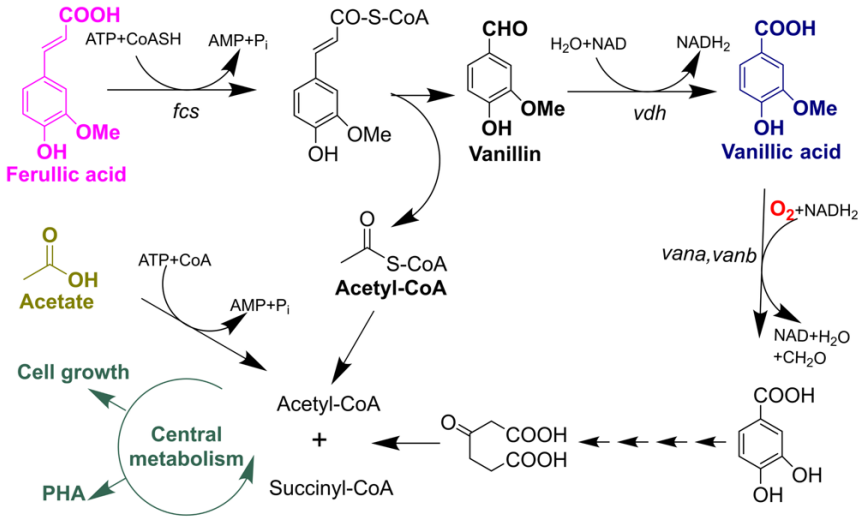
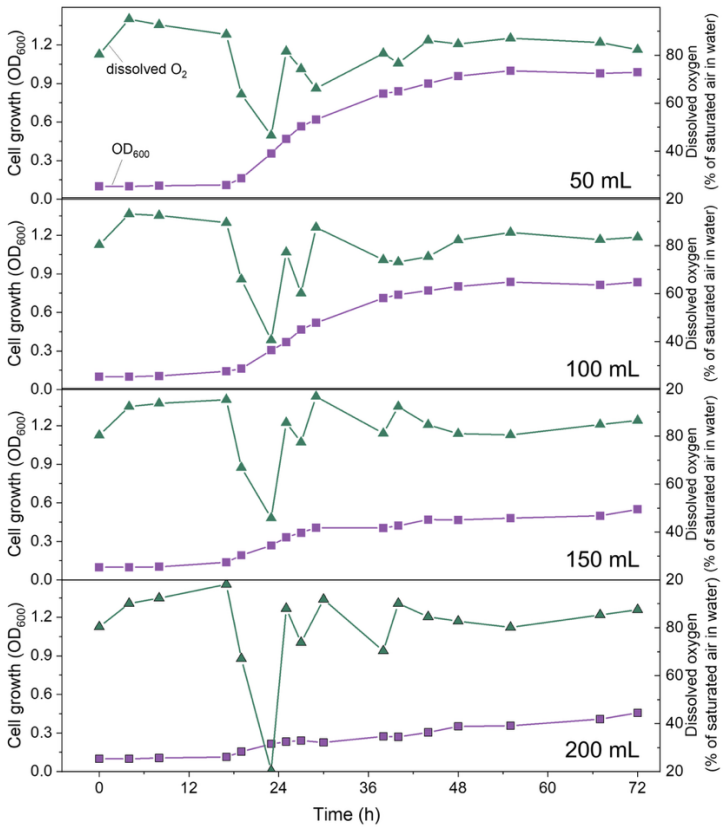
Figures



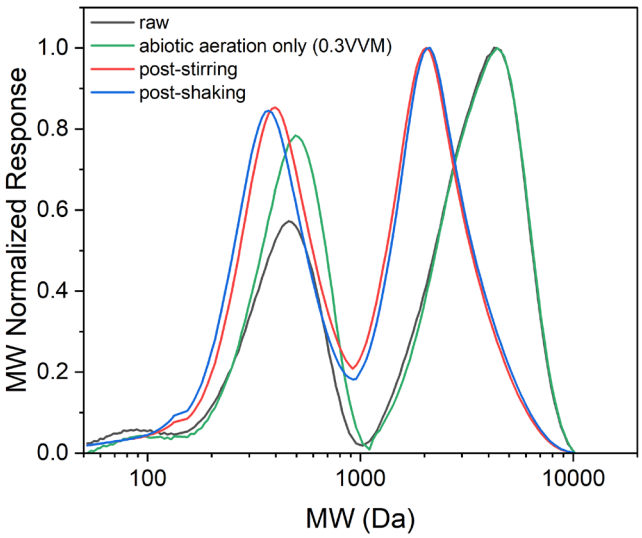
Supplementary Figure 1. Lignin degradation (g/L) with different initial concentrations (2-25 g/L) under nitrogen-limited conditions. Error bars represent the standard deviation of two replicates (n = 2).



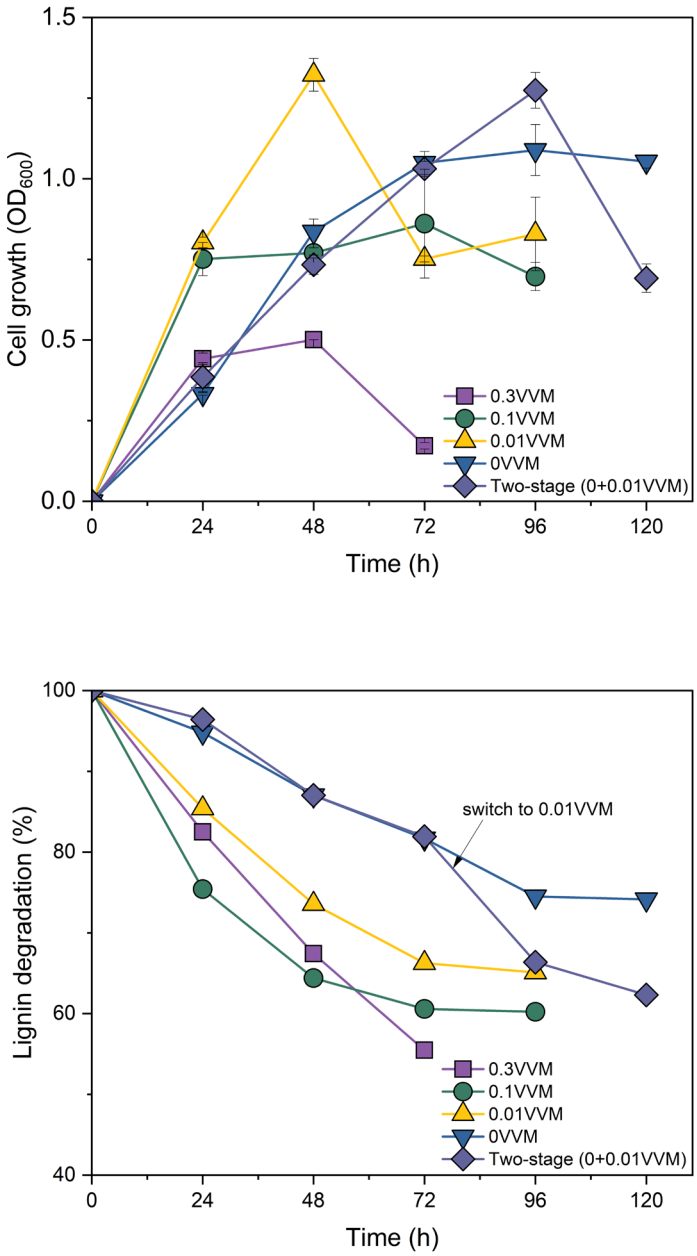
Supplementary Figure 2. Intracellular upper degradation pathways of acetate, vanillic acid, and ferulic acid by *P. putida*, where each arrow represents one-step enzymatic cleavage.



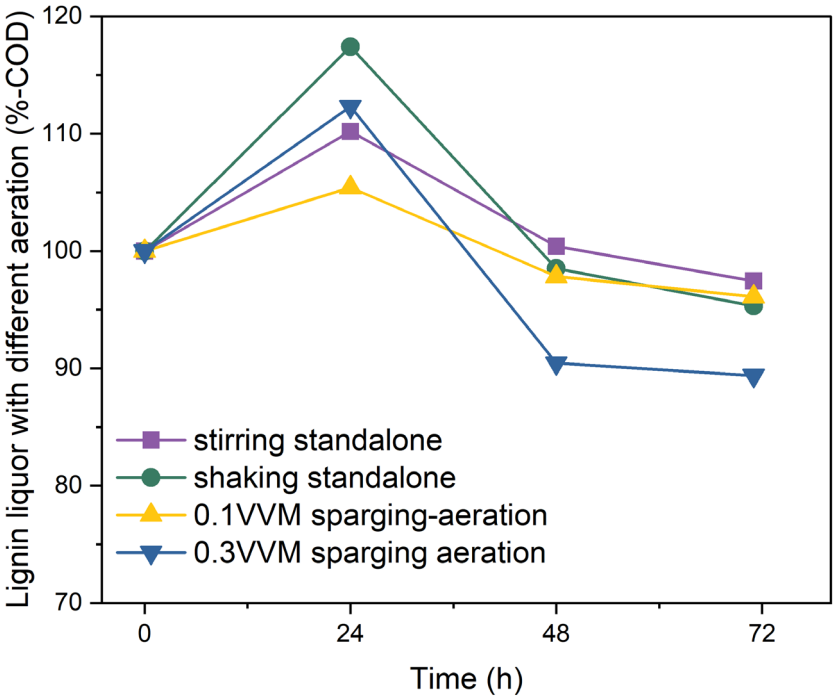
Supplementary Figure 3. Cell growth (OD_{600}) and dissolved oxygen (DO) profile in fermentation of ferulic using shaking flasks with different volumes of medium (50-200 mL).



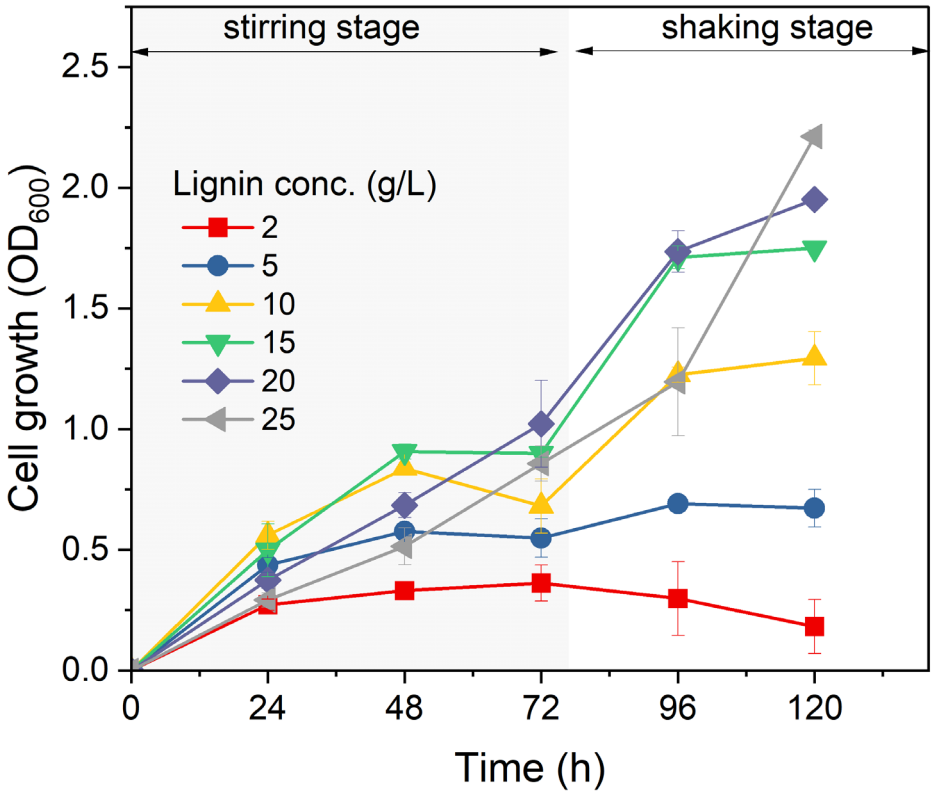
Supplementary Figure 4. Molecular weight distributions of lignin liquor from the raw feedstock, after 72 h of abiotic aeration at 0.3 VVM, after stirring, and after shaking.



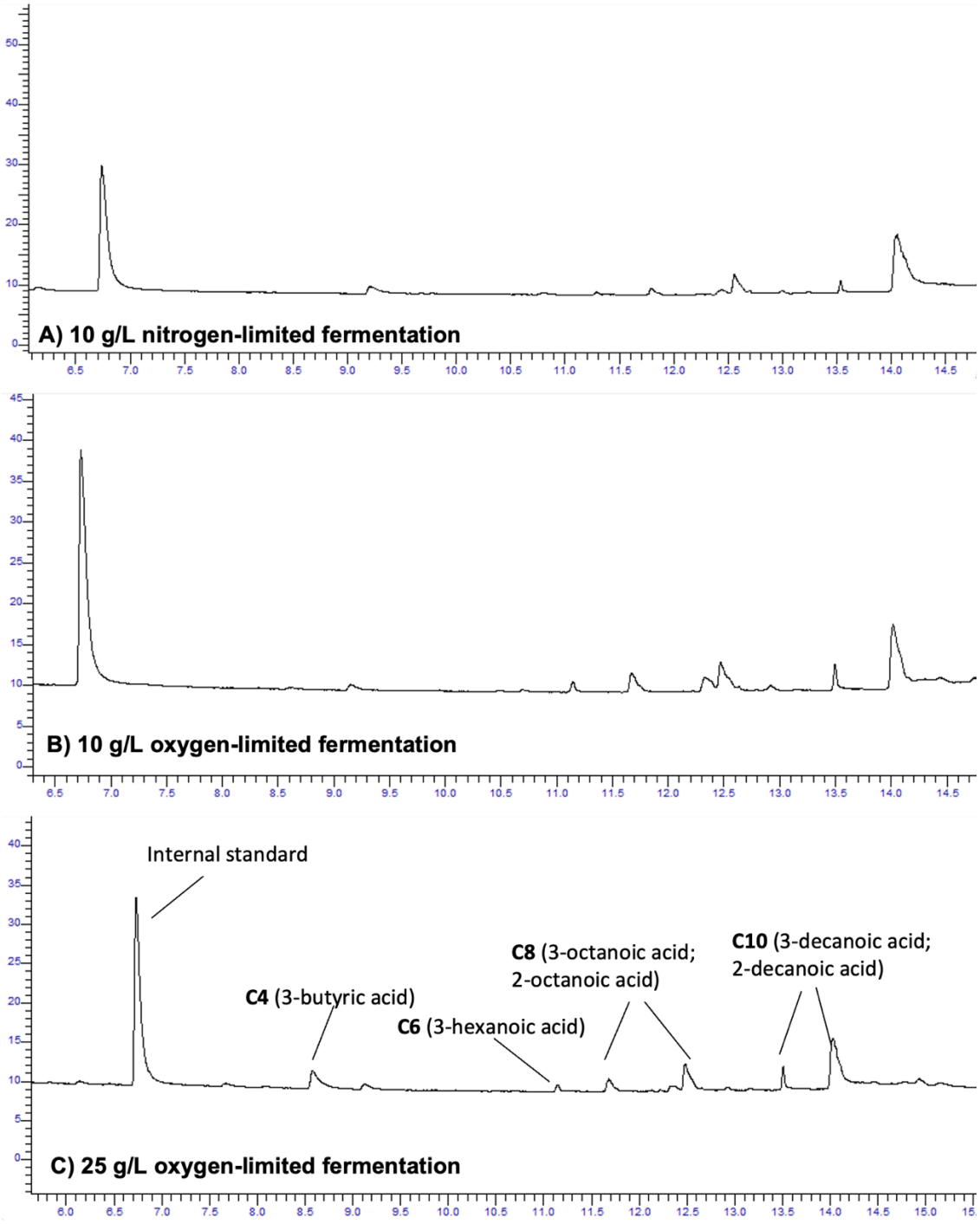
Supplementary Figure 5. Cell growth curve and lignin degradation in a 1 L stirred tank reactor with different levels of air supplementation. Error bars represent the standard deviation of two replicates (n = 2).



Supplementary Figure 6. Substrate loss under abiotic conditions. The stirring-only and shaking-only groups were conducted in 250 mL flasks with a working volume of 100 mL. The 0.1 and 0.3 VVM air-sparging groups were performed in 250 mL beakers with a working volume of 100 mL.



Supplementary Figure 7. Cell growth curve at different feeding concentrations (2-25 g/L) using two-stage O_2 tuning strategy. Error bars indicate one standard deviation from the mean of duplicates. Error bars represent the standard deviation of two replicates (n = 2).



Supplementary Figure 8. GC-FID chromatography of PHA compositions.