

Supplementary Information

Microbial degradation of bioplastic (PHBV) is limited by nutrient availability at high microplastic loadings

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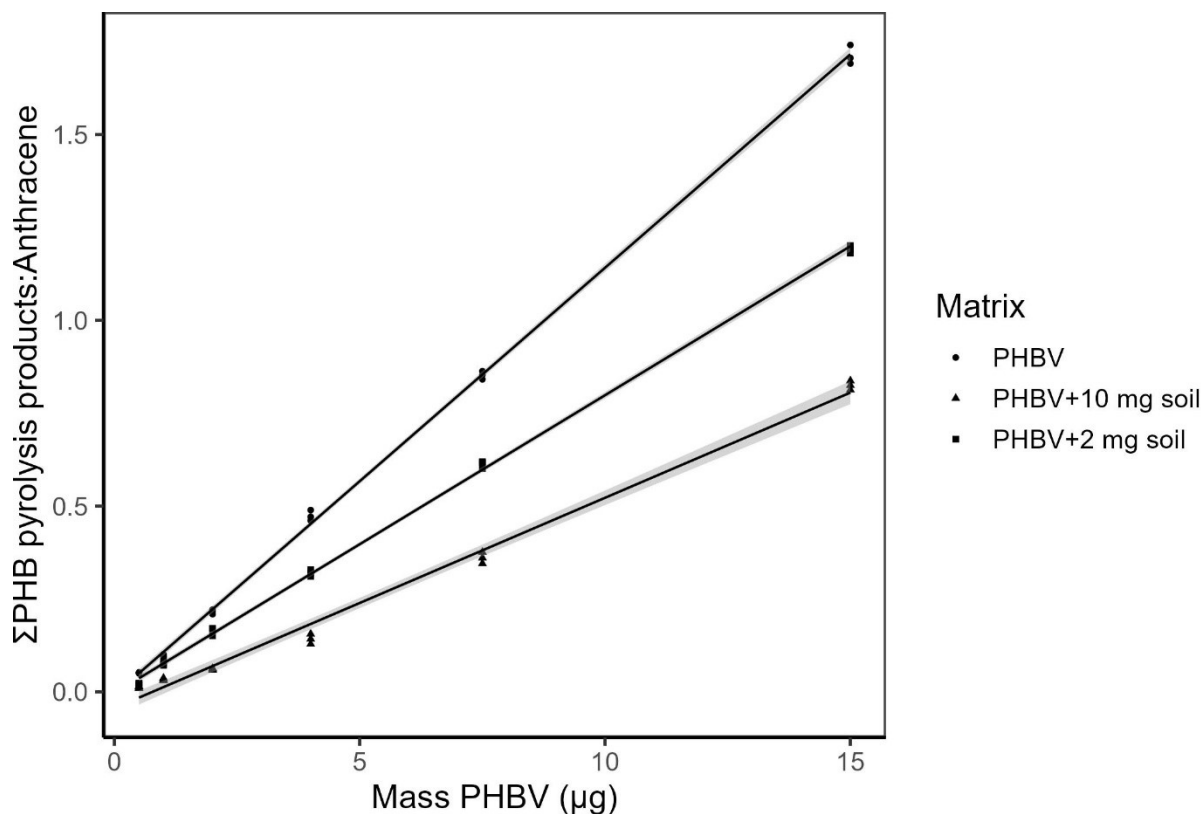


Figure S1: Effect of increasing soil mass (0, 2 and 10 mg) on the pyrolysis response of PHBV, based on the sum of PHB pyrolysis products methyl-3-butenate, *cis*-methyl-2-butenate and *trans*-methyl-2-butenate, relative to the internal standard, anthracene- d_{10} , added to normalise for any differences between pyrolysis runs. Each concentration/soil mass combination were analysed in triplicate. The solid black line is the linear regression, and the grey shading represents the 95% confidence interval. The r^2 for the linear regressions are 0.9983, 0.9981 and 0.9916 for 0 mg, 2 mg and 10 mg of soil, respectively.

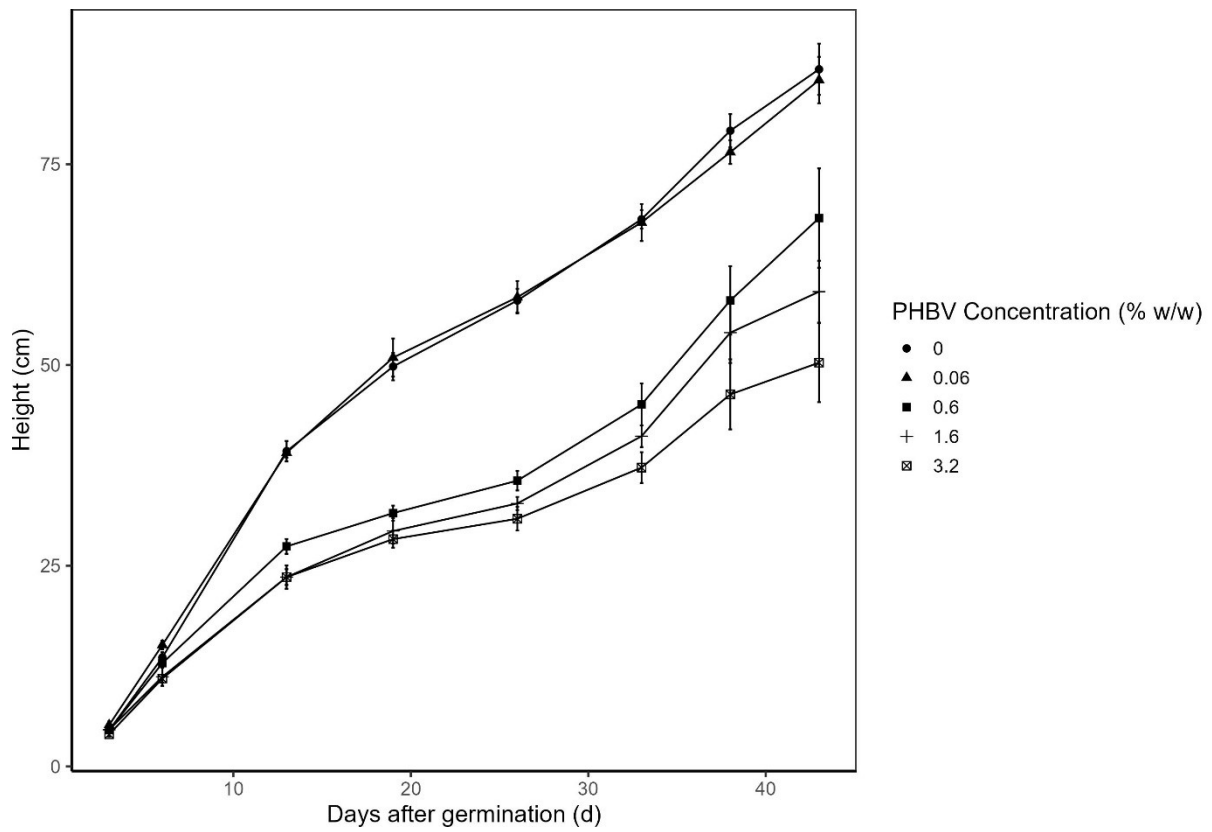


Figure S2: Height of maize plants following germination in response to exposure to varying PHBV microplastic concentrations. Values represent mean \pm S.E. ($n = 5$).

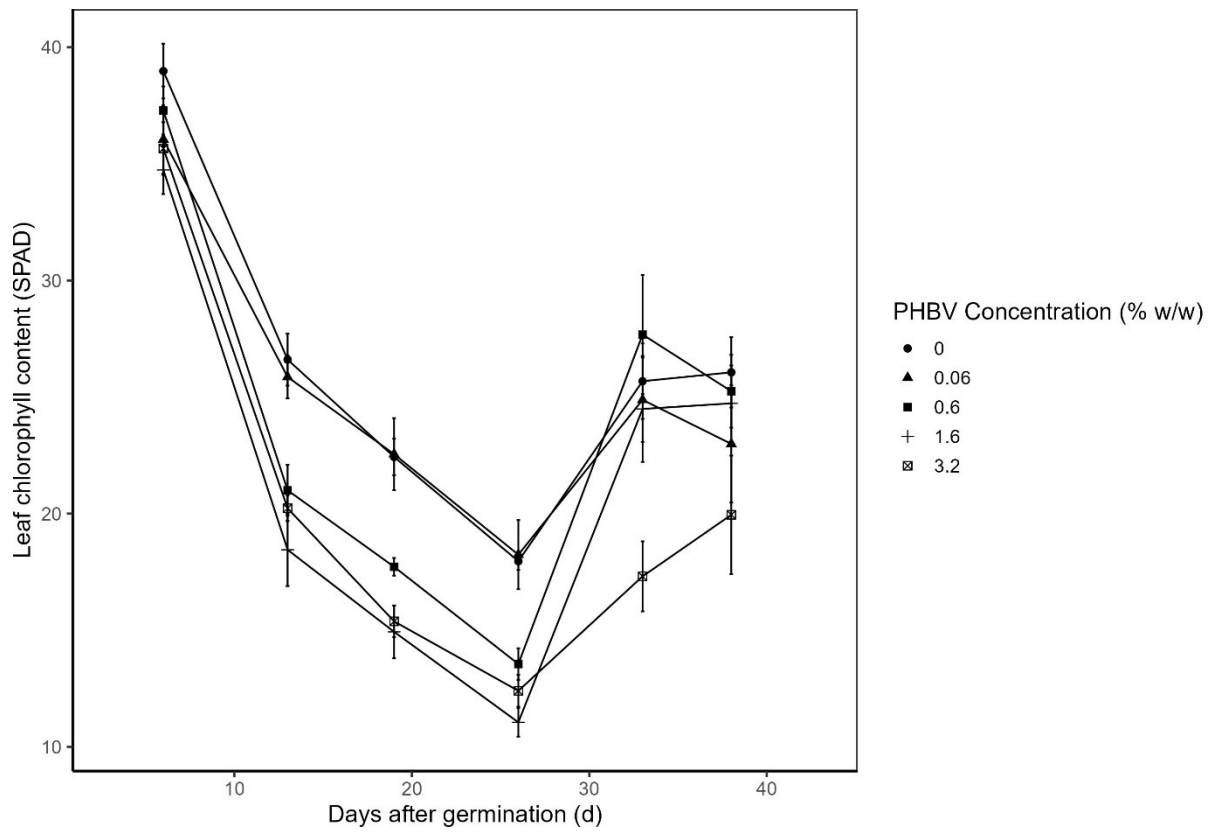


Figure S3: Chlorophyll content (SPAD) of maize leaves following germination in response to exposure to varying PHBV microplastic concentrations. Values represent mean \pm S.E. ($n = 5$).

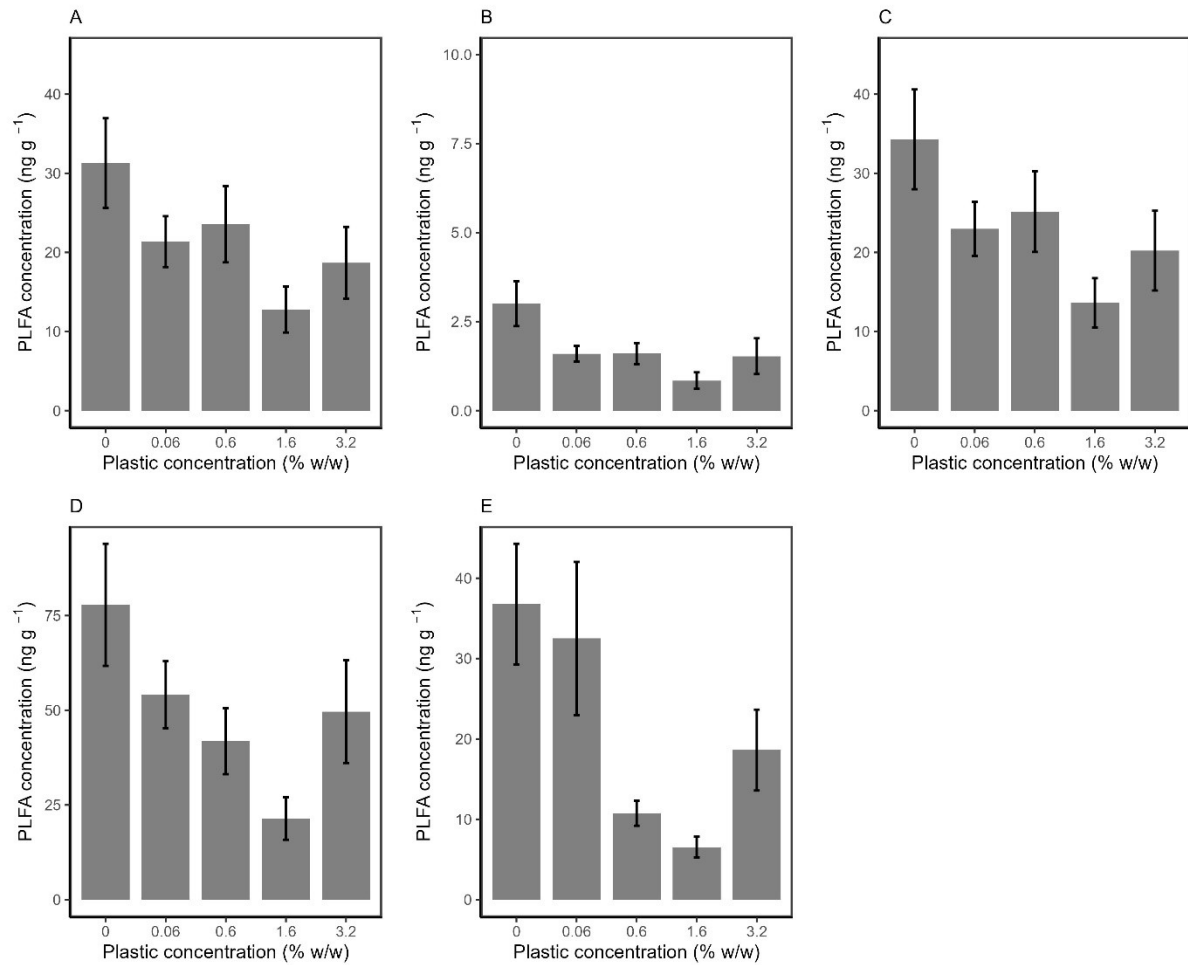


Figure S4: Concentrations of PLFAs in soil attributed to firmicute bacteria (A), actinobacteria (B), total Gram+ bacteria (firmicutes and actinobacteria) (C), Gram- (D) and fungi (E) in response to exposure to varying PHBV microplastic concentrations after 8 weeks. Concentrations were corrected for varying contribution of PHBV in soil. Values represent mean \pm SE ($n = 5$). Note differing scales for clarity.

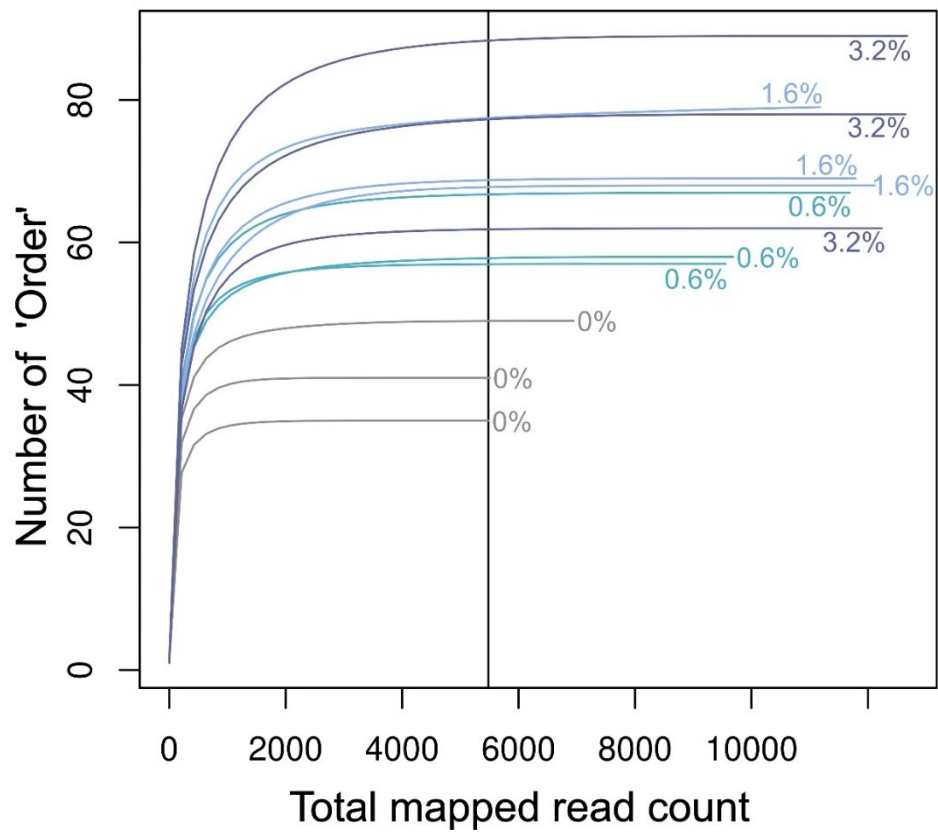


Figure S5: Rarefaction curve with normalised data, demonstrating the minimum required total mapped read count for sufficient sample coverage against taxonomic level 'order'. Each curve represents a replicate for each of the PHBV concentrations in soil (% w/w).

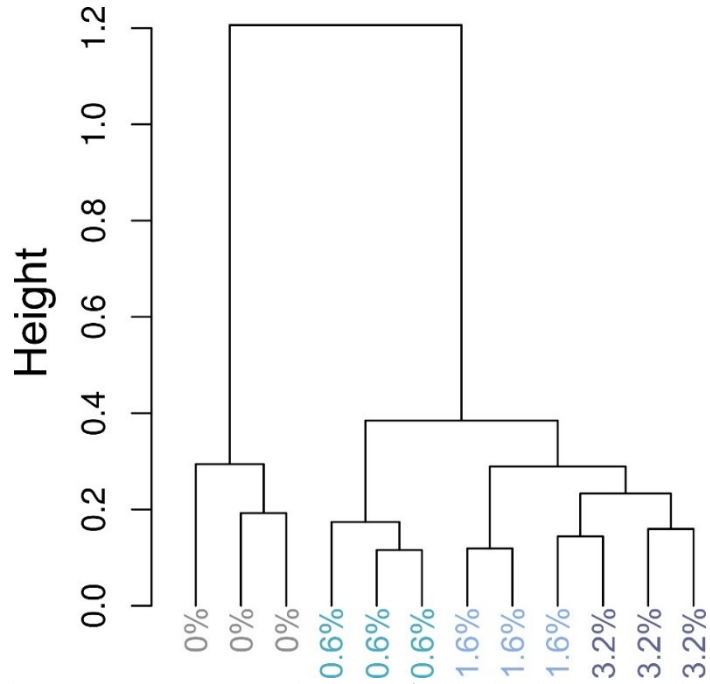


Figure S6: Dendrogram at taxonomic level 'order' with normalised data, clustering samples according to bray distance and ward criterion. The results are replicates for each of the PHBV concentrations in soil (% w/w).

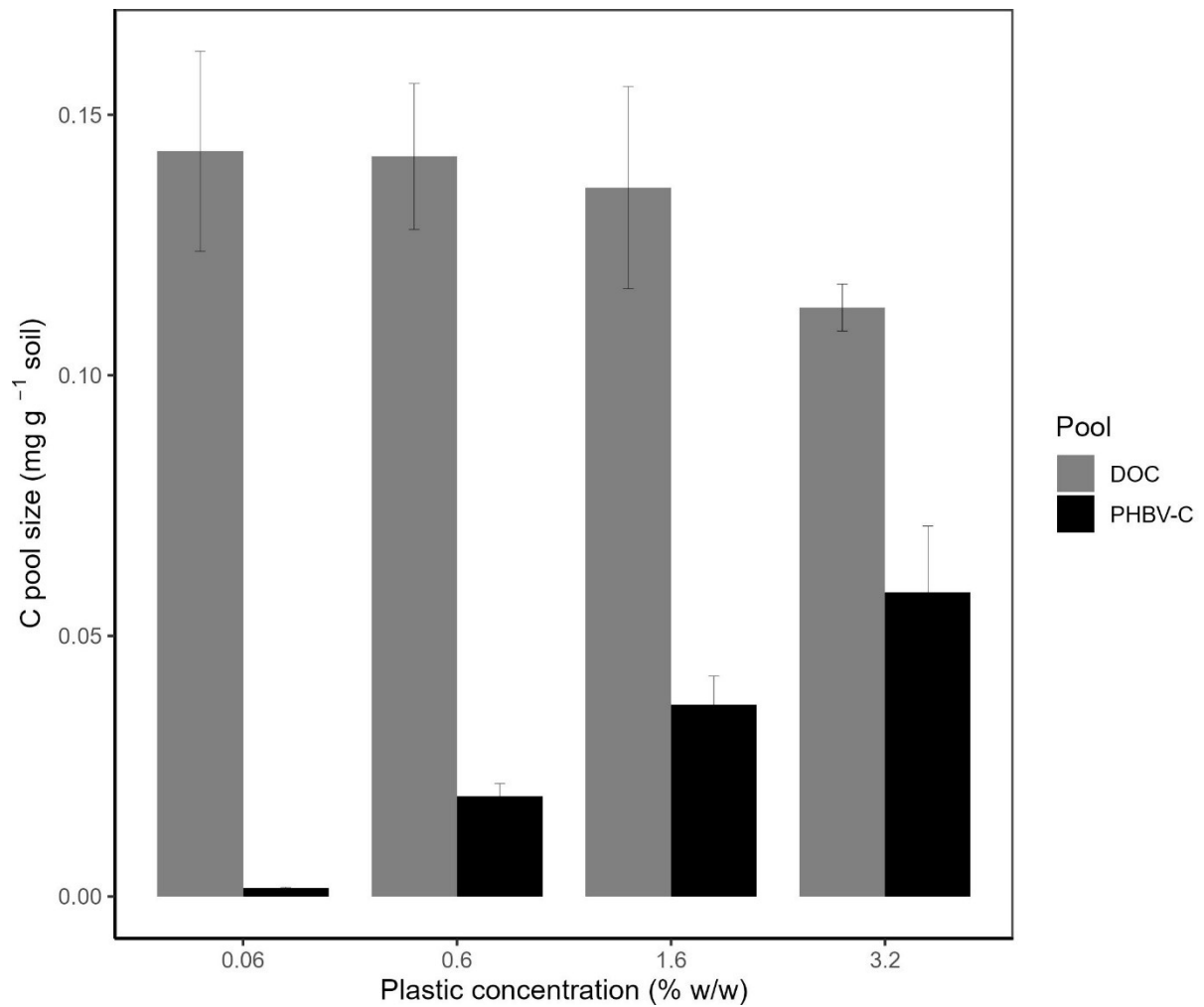


Figure S7: Comparison of soil dissolved oxidisable C (DOC) and PHBV-derived C released during degradation across the 8-week experimental period. Values are mean \pm SE ($n = 5$).

Table S1: Properties of the soil used to establish the plant-soil mesocosm. All values are mean \pm SE ($n = 3$). Soil was also used in Graf et al. (2023).

Soil property	Mean \pm SE
pH	6.1 \pm 0.1
EC ($\mu\text{S cm}^{-1}$)	120 \pm 4
Clay (%)	42.3 \pm 0.9
Silt (%)	42.3 \pm 0.3
Sand (%)	15.3 \pm 0.9
Extractable ammonium (mg N kg^{-1})*	2.5 \pm 0.5
Extractable nitrate (mg N kg^{-1})*	12.4 \pm 2.7
Available phosphate (mg P kg^{-1})*	41.5 \pm 0.6
Extractable potassium (mg K kg^{-1})*	165.3 \pm 4.3

*EC, electrical conductivity. *data expressed on a dry weight basis.*