



Supplement of

Microbial necromass contribution to topsoil organic carbon storage of natural and agricultural ecosystems

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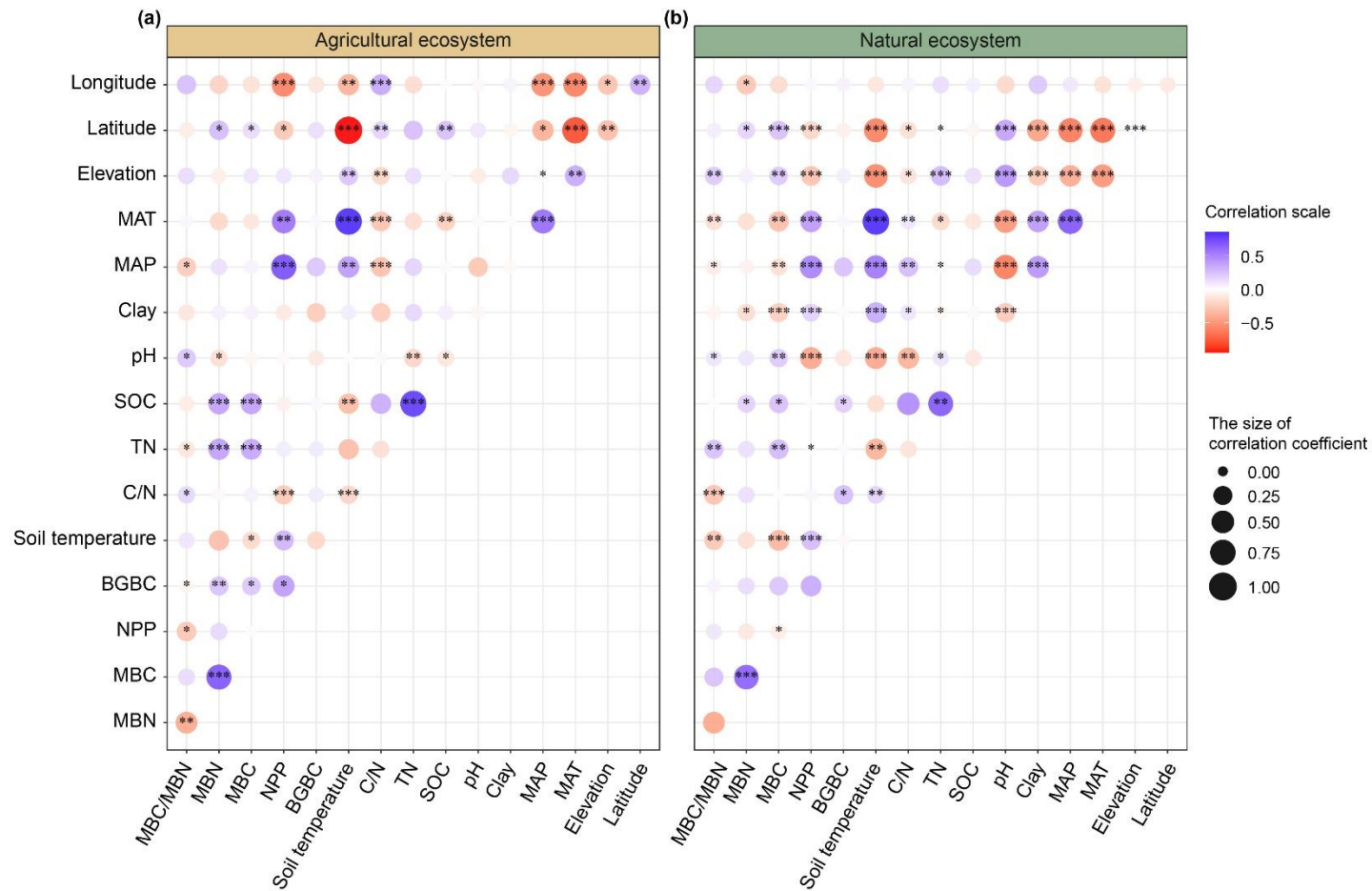


Figure S1. Spearman's rank correlation coefficients among various factors of agricultural and natural ecosystems. Size of circles indicate correlation strength. Abbreviations of factors are consistent with those of Figure 4 in the main text. Significance levels: *** $P < 0.001$, ** $P < 0.01$ and * $P < 0.05$.

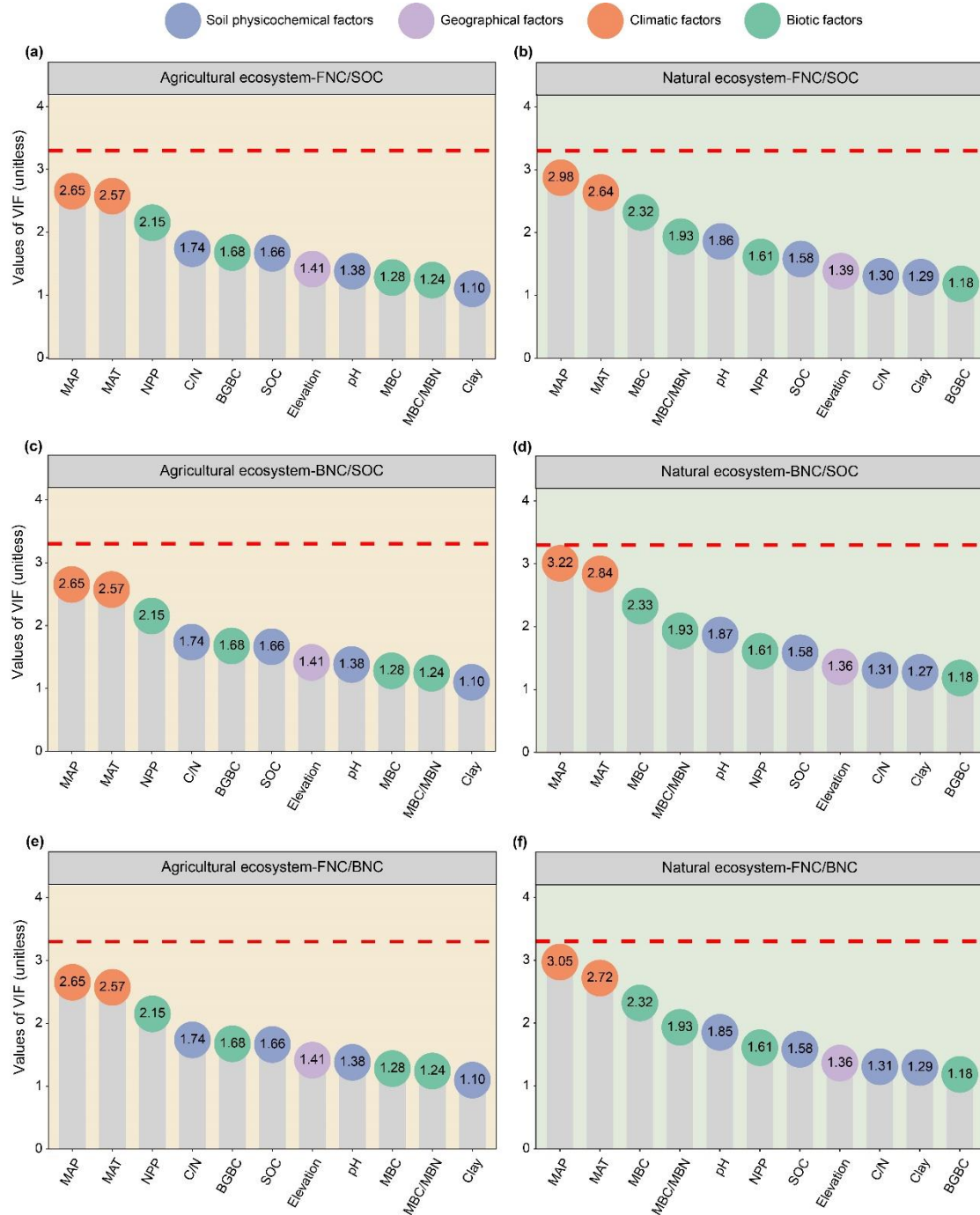


Figure S2. Visualizing the results of variance inflation factor (used for multicollinearity test) in the dataset of the contributions of MNC to SOC, and their ratios in agricultural and natural ecosystems. Panels (a) and (b) delineate the contributions of FNC to SOC across these two ecosystems. Panels (c) and (d) represent the contributions of BNC to SOC, and panels (e) and (f) denote FNC/BNC ratio. The panels in the left (a, c, e) correspond to agricultural ecosystems, and those in the right (b, d, f) pertain to natural ecosystems. Abbreviations of factors are consistent with those of Figure 4 in the main text. The red dashed lines represent the threshold for the variance inflation factor at 3.3.

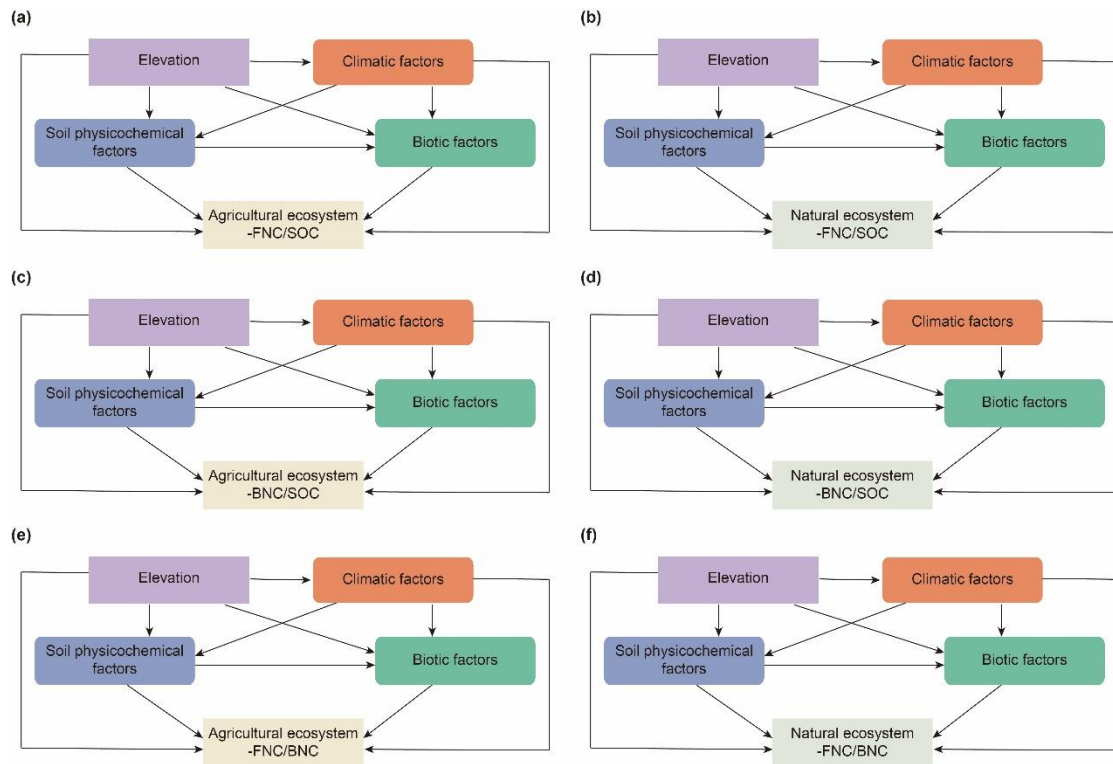


Figure S3. *Priori* structural equation models for agricultural and natural ecosystems. Panels (a) and (b) delineate the contributions of FNC to SOC across these two ecosystems. Panels (c) and (d) represent the contributions of BNC to SOC, and panels (e) and (f) denote FNC/BNC ratio. The panels in the left (a, c, e) correspond to agricultural ecosystems, and those in the right (b, d, f) pertain to natural ecosystems. Right-angled rectangles denote single variables, whereas rounded rectangles represent composite variables. Colors indicate different types of factors. Some differences existed between the *priori* models and the final SEMs because we removed some paths whose coefficients are close to zero or non-significant ($P > 0.05$).

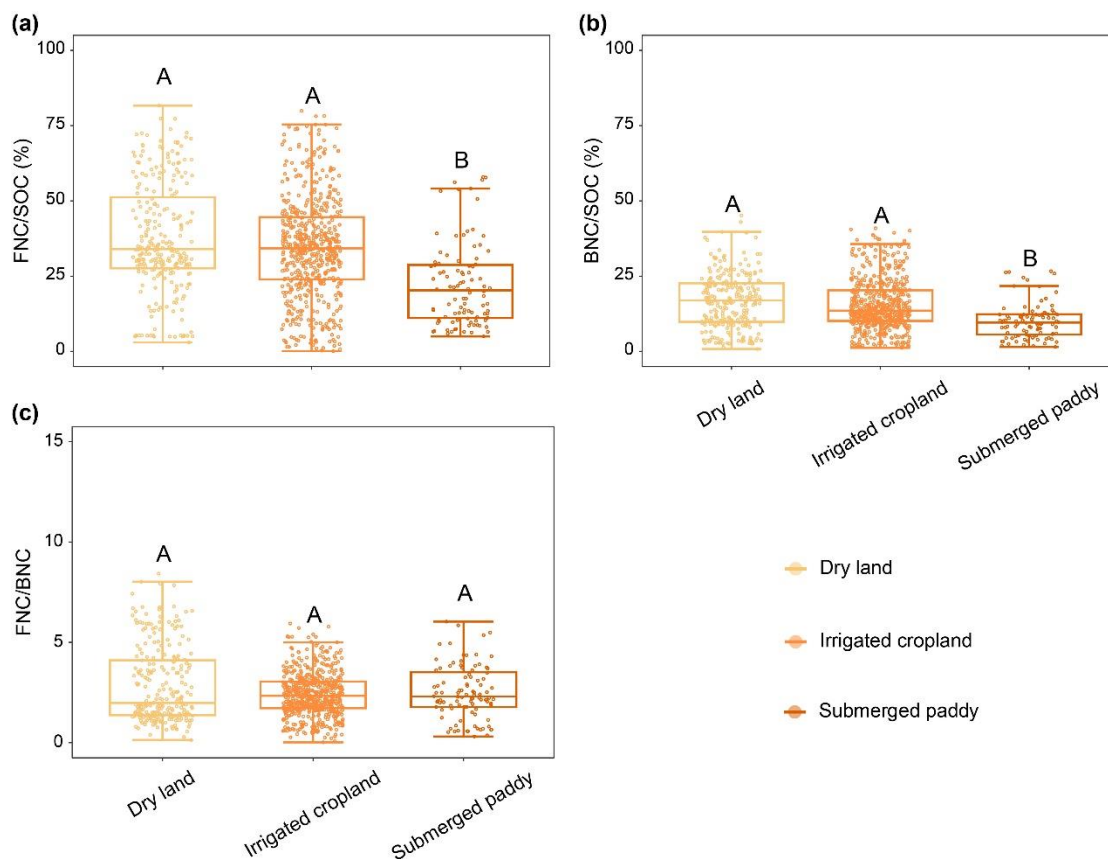


Figure S4. Comparison of the contributions of MNC to SOC, and their ratios among dry land, irrigated cropland and submerged paddy in this study. Comparison of the contributions of FNC (a) and BNC (b) to SOC, and FNC/BNC ratio (c) among dry land, irrigated cropland and submerged paddy. The same capital letter in the same panel indicates that there is no significant difference among the groups ($P > 0.05$), while different capital letters indicate that there is a significant difference among the groups ($P < 0.05$).

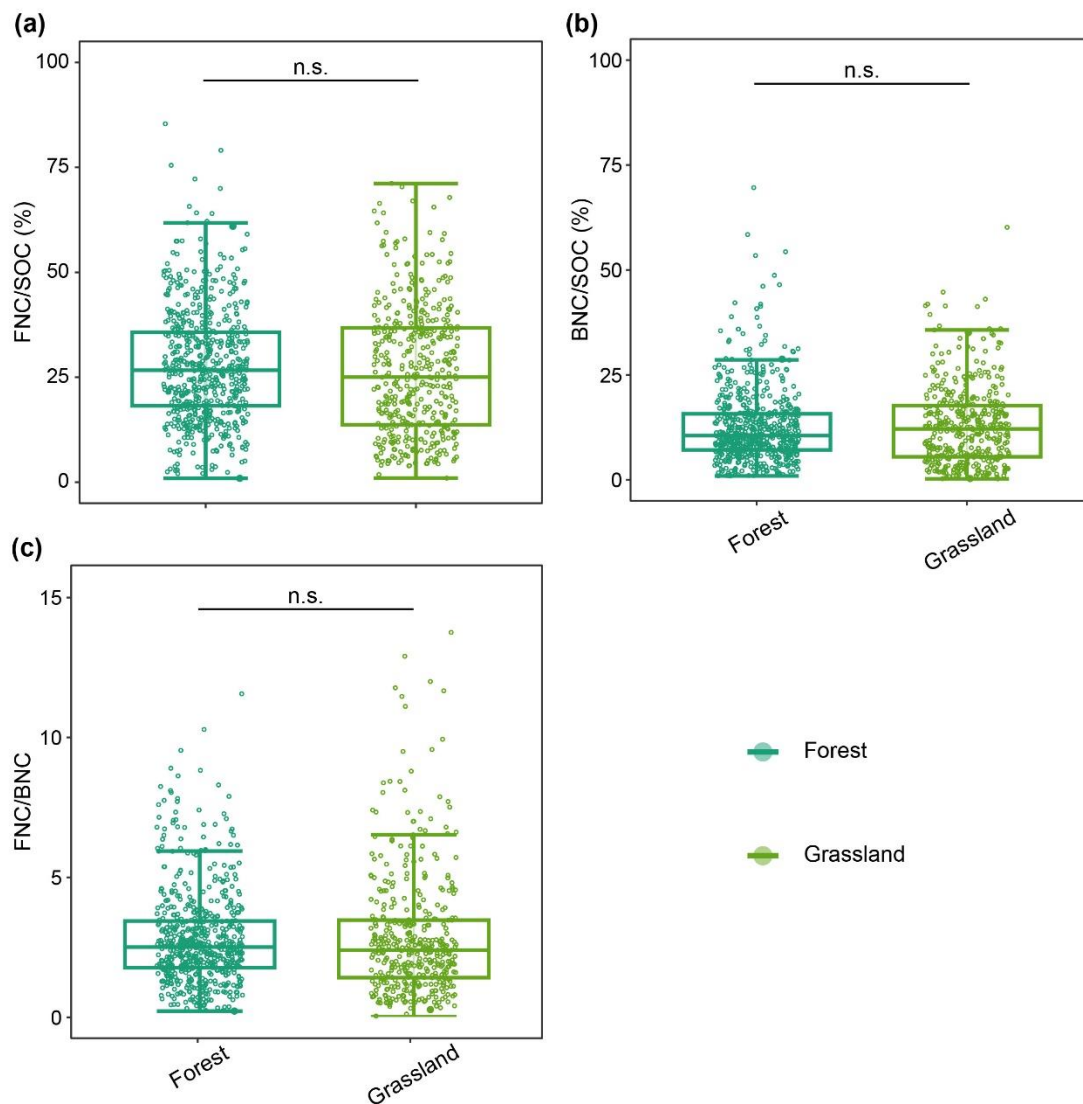


Figure S5. Comparison of the contributions of MNC to SOC, and their ratios between forest and grassland in this study. Comparison of the contributions of FNC (a) and BNC (b) to SOC, and FNC/BNC ratio (c) across forest and grassland. Significance levels: n.s., non-significant ($P > 0.05$).

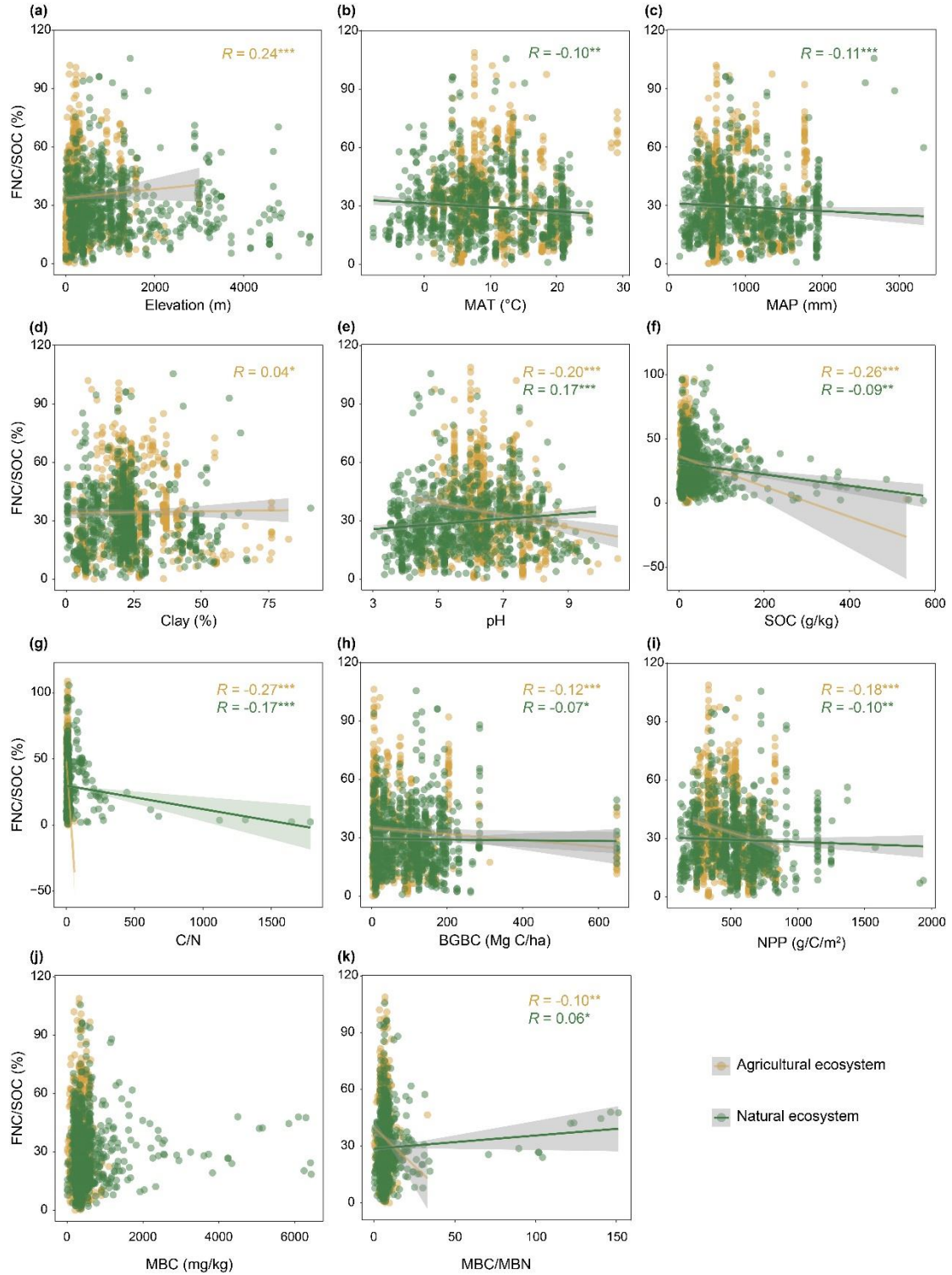


Figure S6. The relationship between various factors and the contributions of FNC to SOC in agricultural and natural ecosystems. The relationship between geographical (a), climatic (b, c), soil physicochemical (d–g) and biotic factors (h–k) and the contributions of FNC to SOC in agricultural and natural ecosystems. Abbreviations of factors are consistent with those of Figure 4 in the main text.

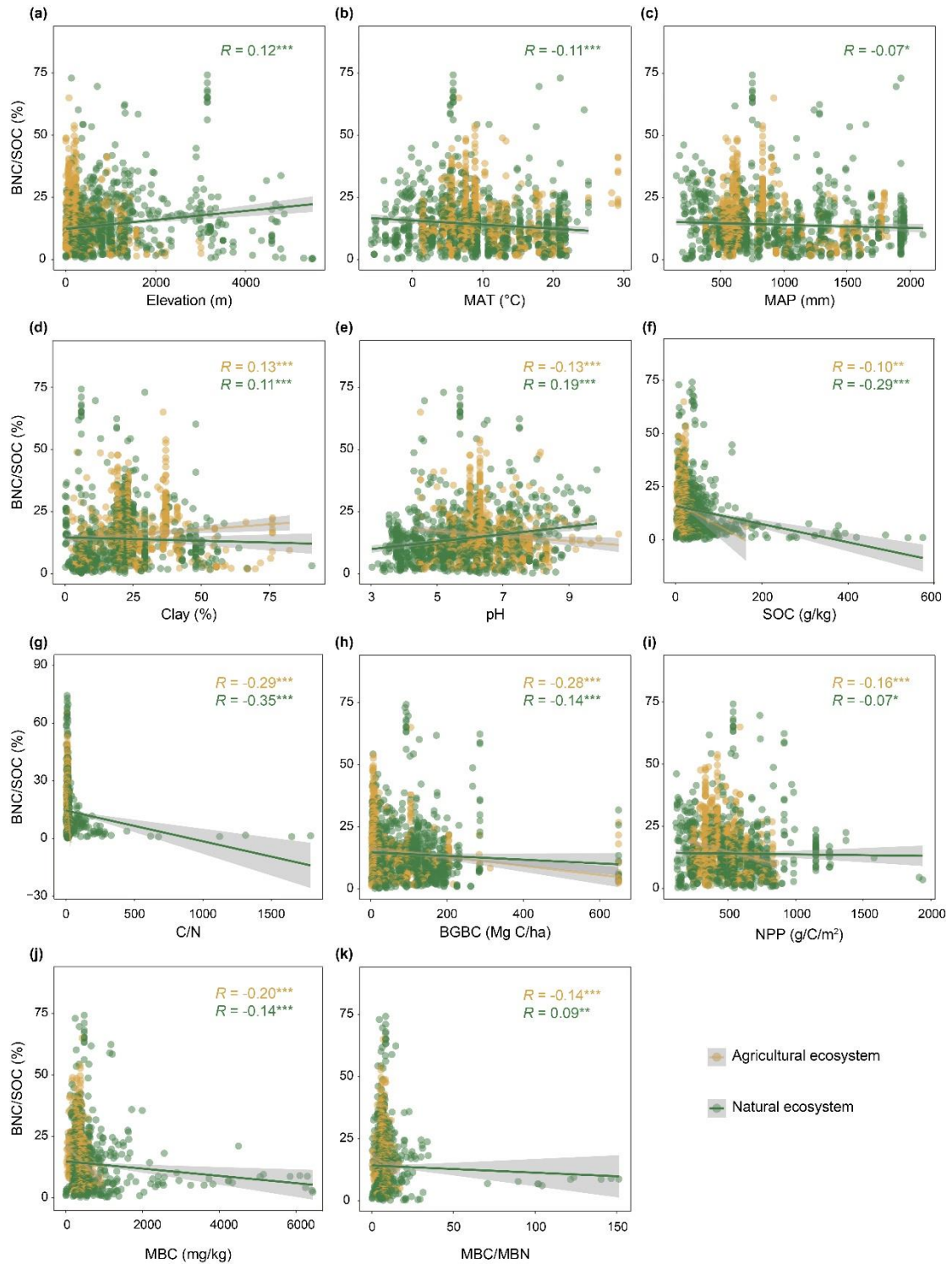


Figure S7. The relationship between various factors and the contributions of BNC to SOC in agricultural and natural ecosystems. The relationship between geographical (a), climatic (b, c), soil physicochemical (d–g) and biotic factors (h–k) and the contributions of BNC to SOC in agricultural and natural ecosystems. Abbreviations of factors are consistent with those of Figure 4 in the main text.

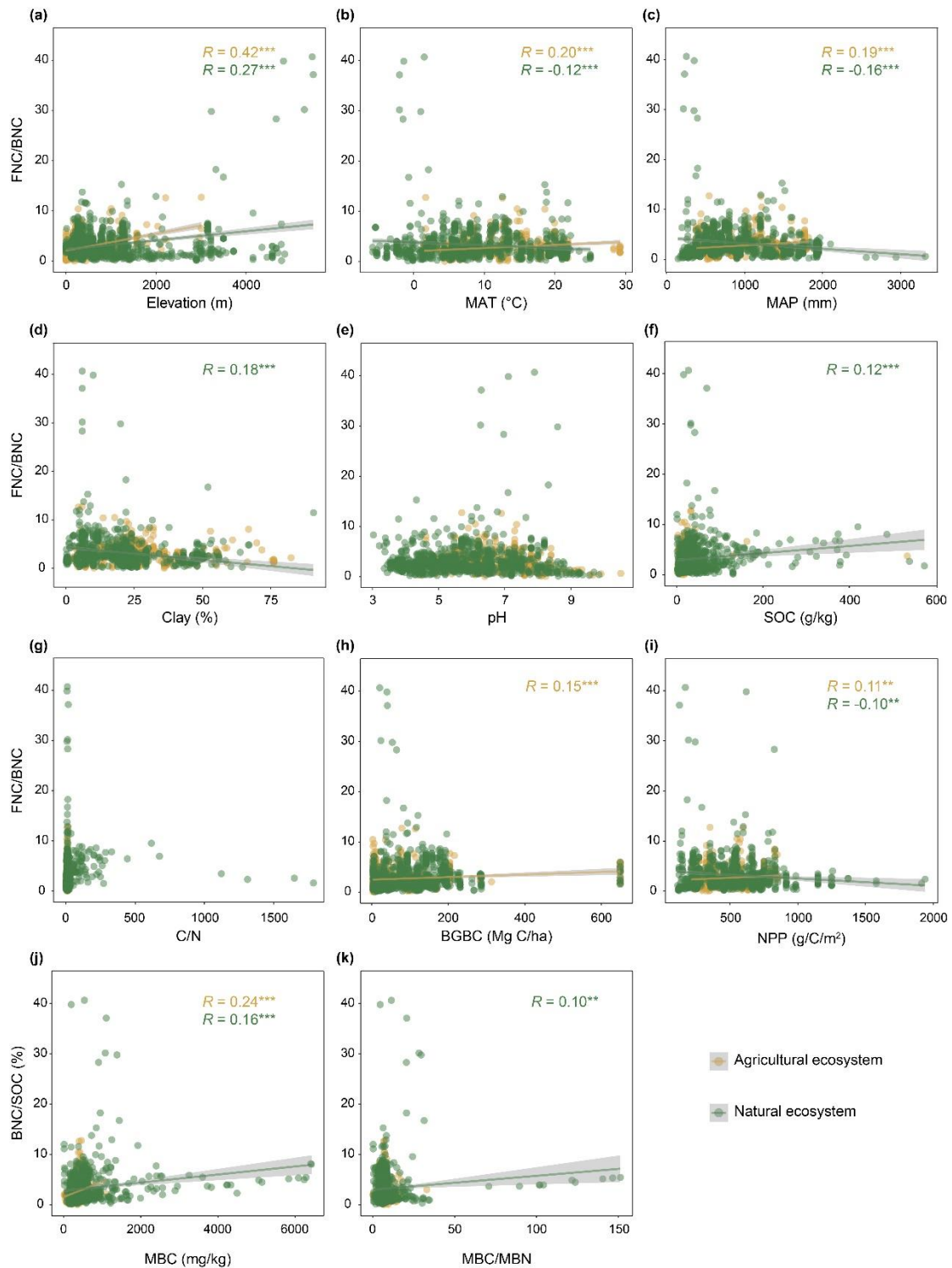


Figure S8. The relationship between various factors and the FNC/BNC ratio in agricultural and natural ecosystems. The relationship between geographical (a), climatic (b, c), soil physicochemical (d–g) and biotic factors (h–k) and FNC/BNC ratios in agricultural and natural ecosystems. Abbreviations of factors are consistent with those of Figure 4 in the main text.