

Species diversity of forest floor biota in non-native Douglas-fir stands is similar to that of native stands

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Appendix S1

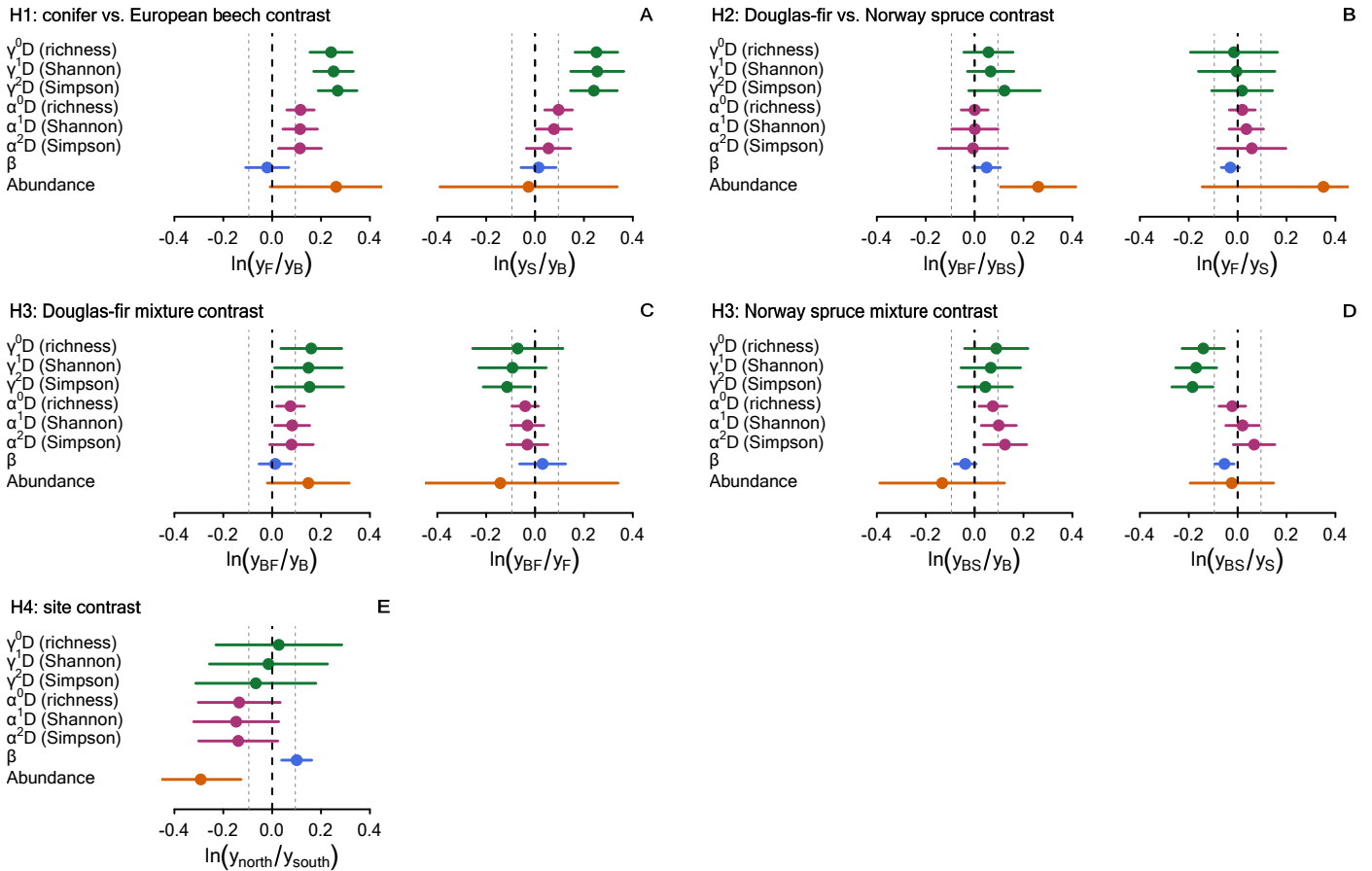


Figure S1: Forest specialists subset: multi-taxon synthesis of relative differences of eight forest associates between different stand types and under different site conditions. The log response ratio of the target variable y is used to quantify contrasts between stand types (pure stands of Douglas fir F, Norway spruce S and European beech B and mixed stands of European beech with each of the conifers, BF and BS, each group with $n = 8$, panels A to D) and regarding site conditions (more favorable southern sites and less favorable northern sites, each group with $n = 20$, panel E). Diversity is estimated via Hill-numbers of order 0, 1 and 2 (species richness 0D , Shannon diversity 1D and Simpson diversity 2D). Diversity is estimated at plot-level (alpha diversity α^0D , α^1D and α^2D , purple), across all plots of the same stand type (gamma diversity γ^0D , γ^1D , γ^2D , green) and as the spatial species turnover between plots (beta diversity β , blue). Abundance contrasts are colored in orange. Mean estimates of the log response ratios (dots) and 95% confidence intervals (whiskers) are presented. The black dashed 0-line represents no difference between stand types or site conditions. Greater absolute values of the log response ratio than 0.095 (grey dashed lines) represent substantial differences where estimates of the more diverse or abundant category exceed estimates of the less diverse or abundant category by at least 10%.

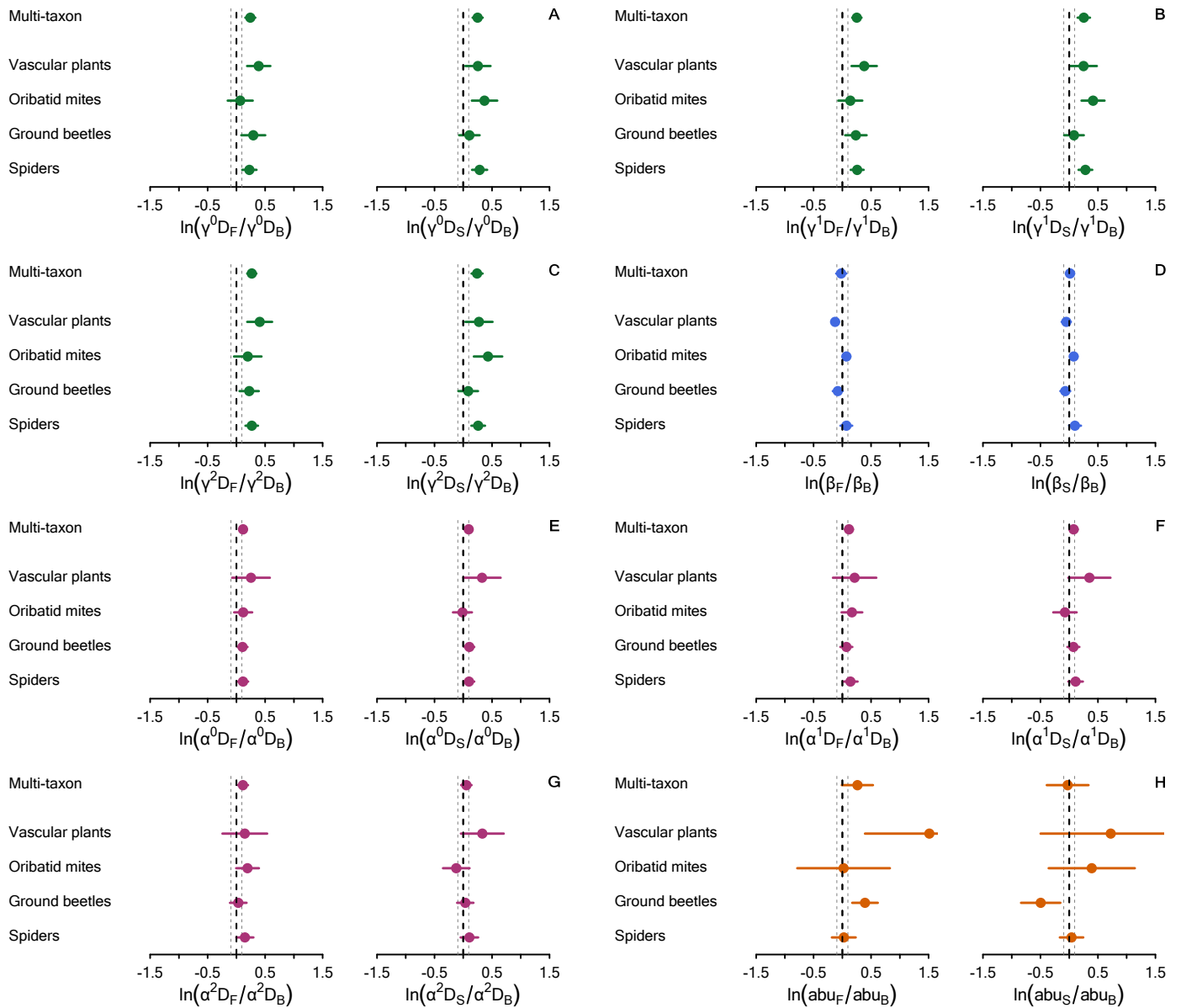


Figure S2: Forest specialists subset: relative difference in diversity and abundance of eight different forest associates between pure conifer and pure European beech stands. The log response ratio of the target variable y is used to quantify contrasts regarding the species compositions of associated forest associates between Douglas fir (F, $n = 8$) and Norway spruce (S, $n = 8$) stands in relation to European beech stands (B, $n = 8$) ($\ln(x_F/x_B)$ or $\ln(x_S/x_B)$). Negative values of the log response ratio indicate support of hypothesis 1 (larger values in European beech stands), positive or neutral values are in opposition to hypothesis 1 (larger values in conifer stands). For a detailed description of the variables, see Figure S1. Note the different scale of the x-axes of the panels referring to abundances (H) or diversity (A to G).

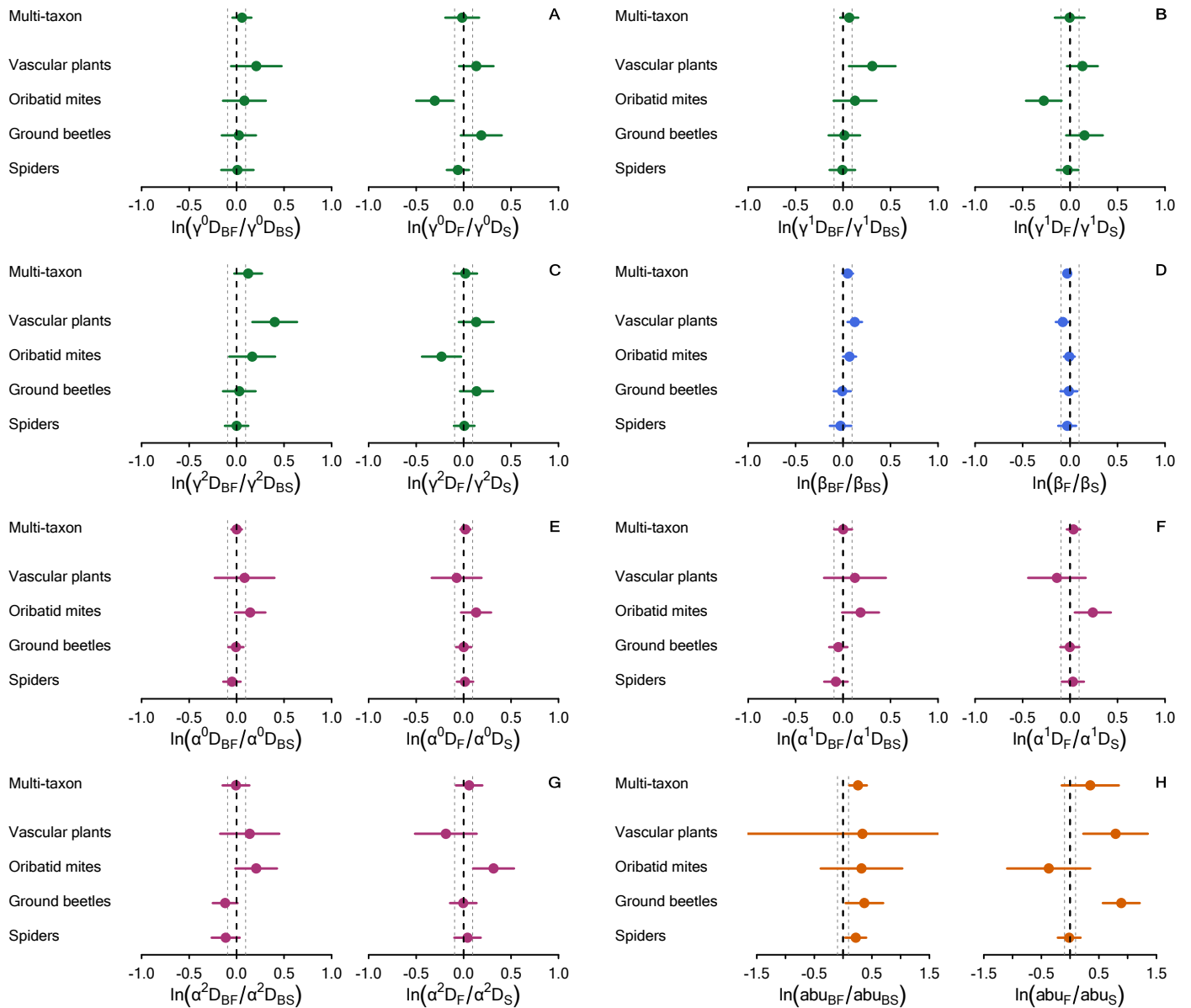


Figure S3: Forest specialists subset: Relative difference in diversity and abundance of eight different forest associates between pure stands of Douglas fir and Norway spruce and between stands of each conifer mixed with European beech. The log response ratio of the target variable y is used to quantify contrasts regarding the species compositions of associated forest associates between pure or mixed Douglas fir stands (F or BF, $n = 8$) in relation to pure or mixed Norway spruce stands (S or BS, $n = 8$) ($\ln(x_{BD}/x_{BS})$ or $\ln(x_D/x_S)$). Negative values of the log response ratio indicate support of hypothesis 2 (larger values in native spruce than non-native Douglas fir stands), positive or neutral values are in opposition to hypothesis 2 (equal or larger values in non-native Douglas fir compared to native spruce). For a detailed description of the variables, see Figure S1. Note the different scale of the x-axes of the panels referring to abundances (H) or diversity (A to G).

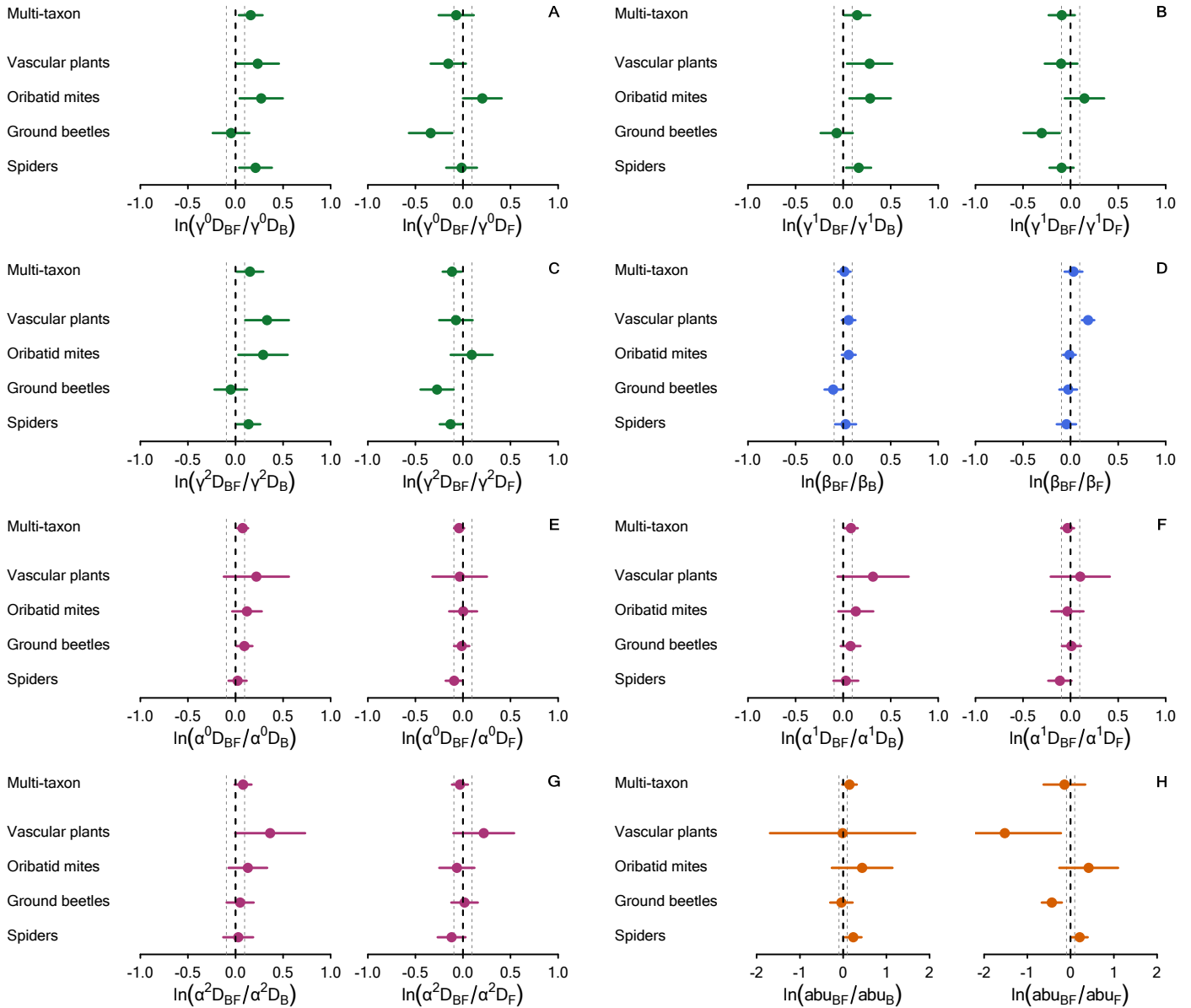


Figure S4: Forest specialists subset: Relative difference in diversity and abundance of eight different forest associates between mixed and pure stands of European beech and Douglas fir. The log response ratio of the target variable y is used to quantify contrasts regarding the species compositions of associated forest associates between mixed European beech-Douglas fir stands (BF, $n = 8$) in relation to pure stands of both species (B or F, $n = 8$) ($\ln(x_{BF}/x_B)$ or $\ln(x_{BF}/x_F)$). Negative values of the log response ratio indicate support of hypothesis 3 (larger values in mixed than in pure stands), positive or neutral values are in opposition to hypothesis 3 (equal or larger values in pure than in mixed stands). For a detailed description of the variables, see Figure S1. Note the different scale of the x-axes of the panels referring to abundances (H) or diversity (A to G).

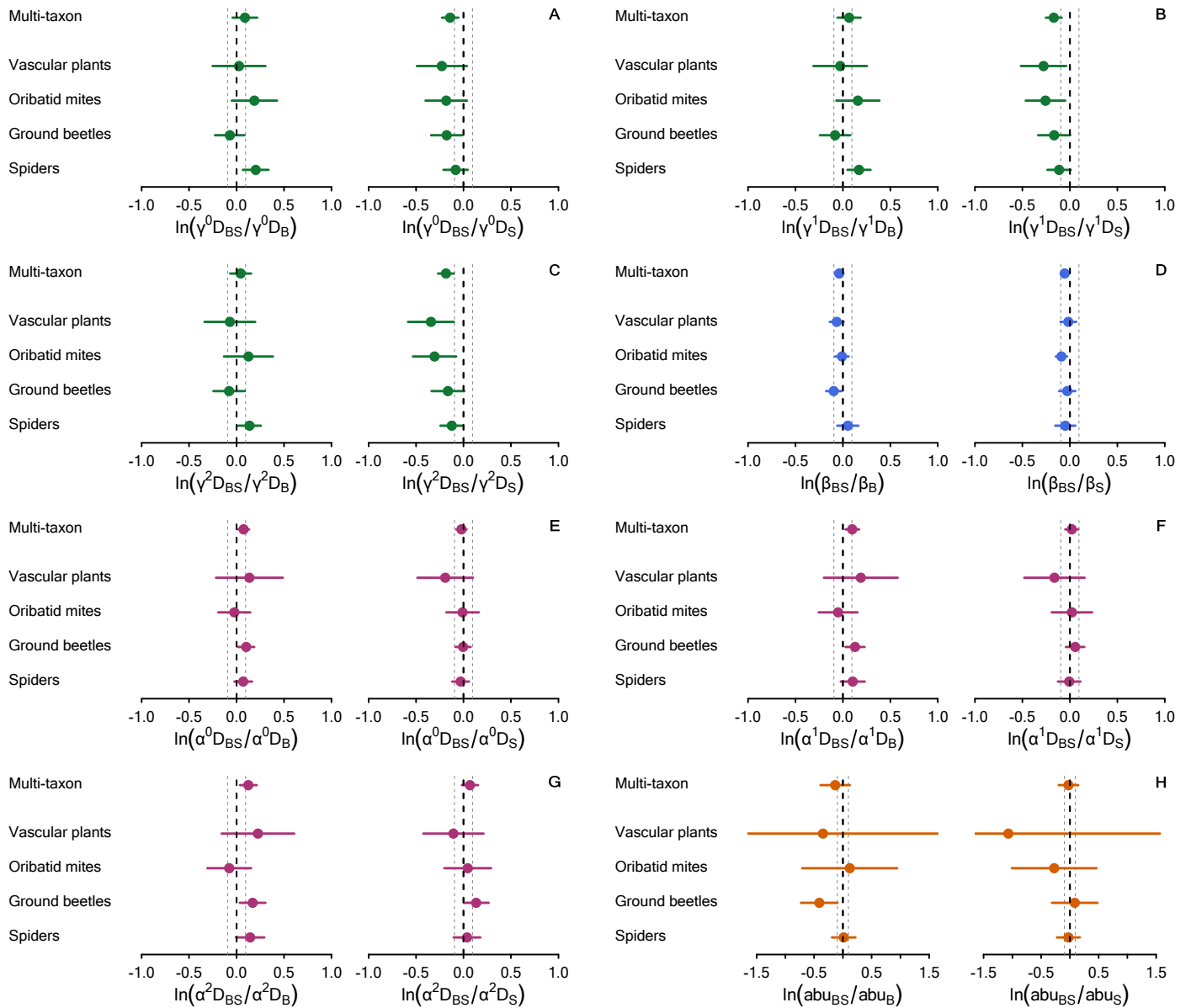


Figure S5: Forest specialists subset: Relative difference in diversity and abundance of eight different forest associates between mixed and pure stands of European beech and Norway spruce. The log response ratio of the target variable y is used to quantify contrasts regarding the species compositions of associated forest associates between mixed European beech-Douglas fir stands (BS, $n = 8$) in relation to pure stands of both species (B or S, $n = 8$) ($\ln(x_{BS}/x_B)$ or $\ln(x_{BS}/x_S)$). Negative values of the log response ratio indicate support of hypothesis 3 (larger values in mixed than in pure stands), positive or neutral values are in opposition to hypothesis 3 (equal or larger values in pure than in mixed stands). For a detailed description of the variables, see Figure S1. Note the different scale of the x-axes of the panels referring to abundances (H) or diversity (A to G).

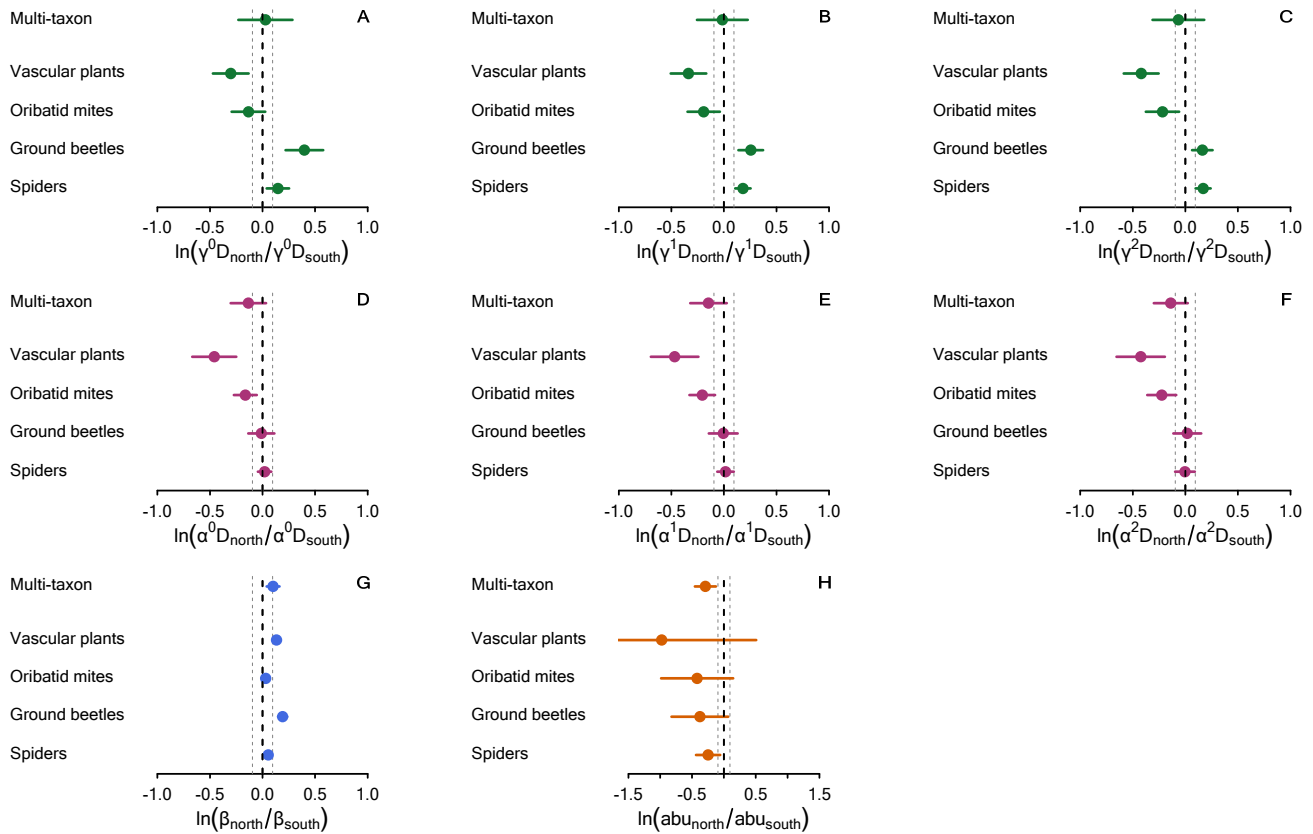


Figure S6: Forest specialists subset: relative difference in diversity and abundance of eight different forest associates between northern sites (less favorable site conditions) and southern sites (more favorable site conditions). The log response ratio of the target variable y is used to quantify average contrasts across five stand types (pure stands of Douglas fir, Norway spruce and European beech and mixed stands of European beech with each of the conifers) regarding the species compositions of associated forest associates between northern ($n = 20$) and southern ($n = 20$) sites. Negative values of the log response ratio indicate support of hypothesis 4 (larger values on sites with more favorable site conditions), positive or neutral values are in opposition to hypothesis three (equal or larger values on sites with less favorable site conditions). For a detailed description of the variables, see Figure S1. Note the different scale of the x-axes of the panels referring to abundances (H) or diversity (A to G).

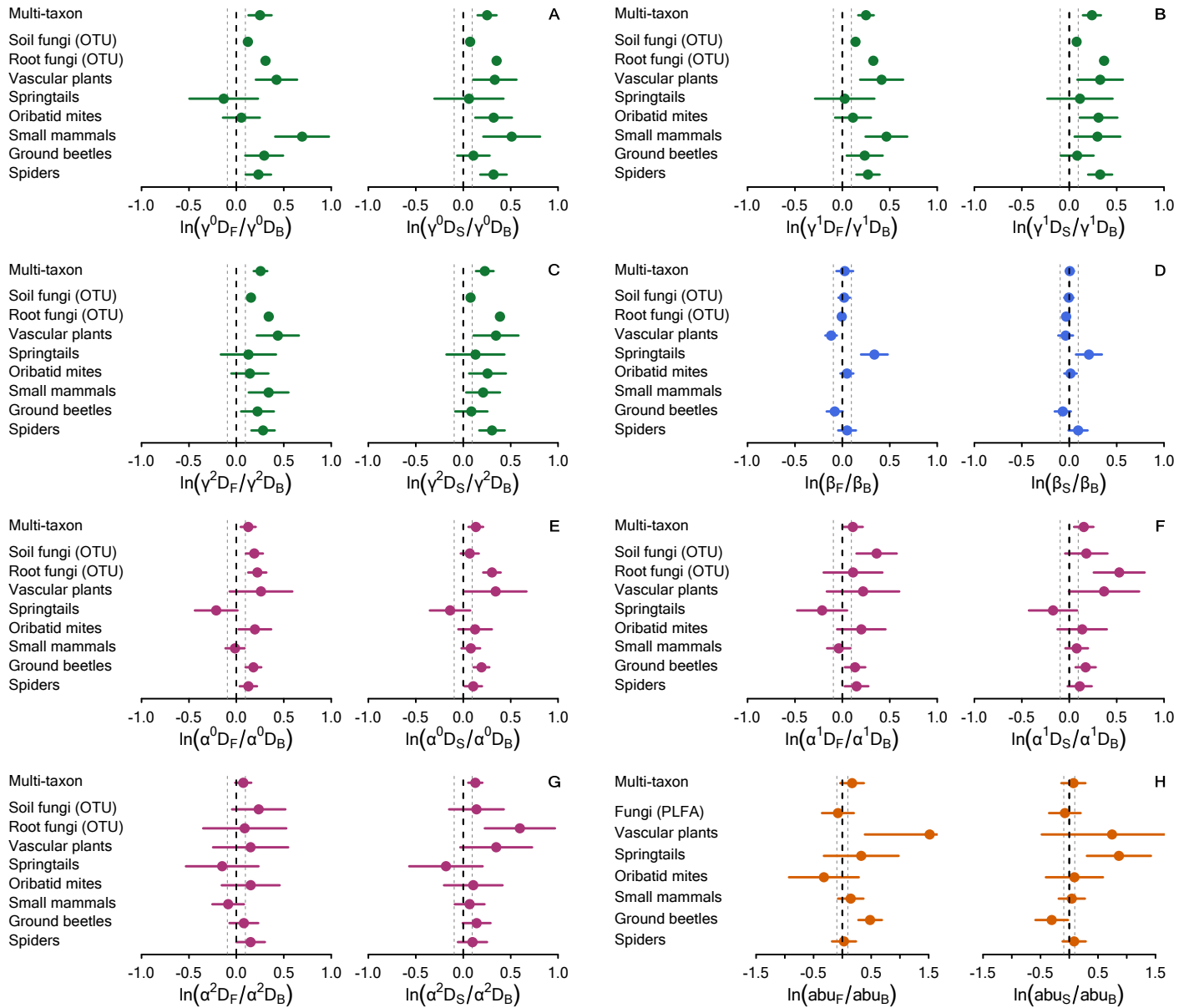


Figure S7: Relative difference in diversity and abundance of eight different forest associates between pure conifer and pure European beech stands. Full version of Figure 2 that includes as well Shannon and Simpson diversity. The log response ratio of the target variable y is used to quantify contrasts regarding the species compositions of associated forest associates between Douglas fir (F , $n = 8$) and Norway spruce (S , $n = 8$) stands in relation to European beech stands (B , $n = 8$) ($\ln(x_F/x_B)$ or $\ln(x_S/x_B)$). Negative values of the log response ratio indicate support of hypothesis 1 (larger values in European beech stands), positive or neutral values are in opposition to hypothesis 1 (larger values in conifer stands). For a detailed description of the variables, see Figure S1. Note the different scale of the x-axes of the panels referring to abundances (H) or diversity (A to G).

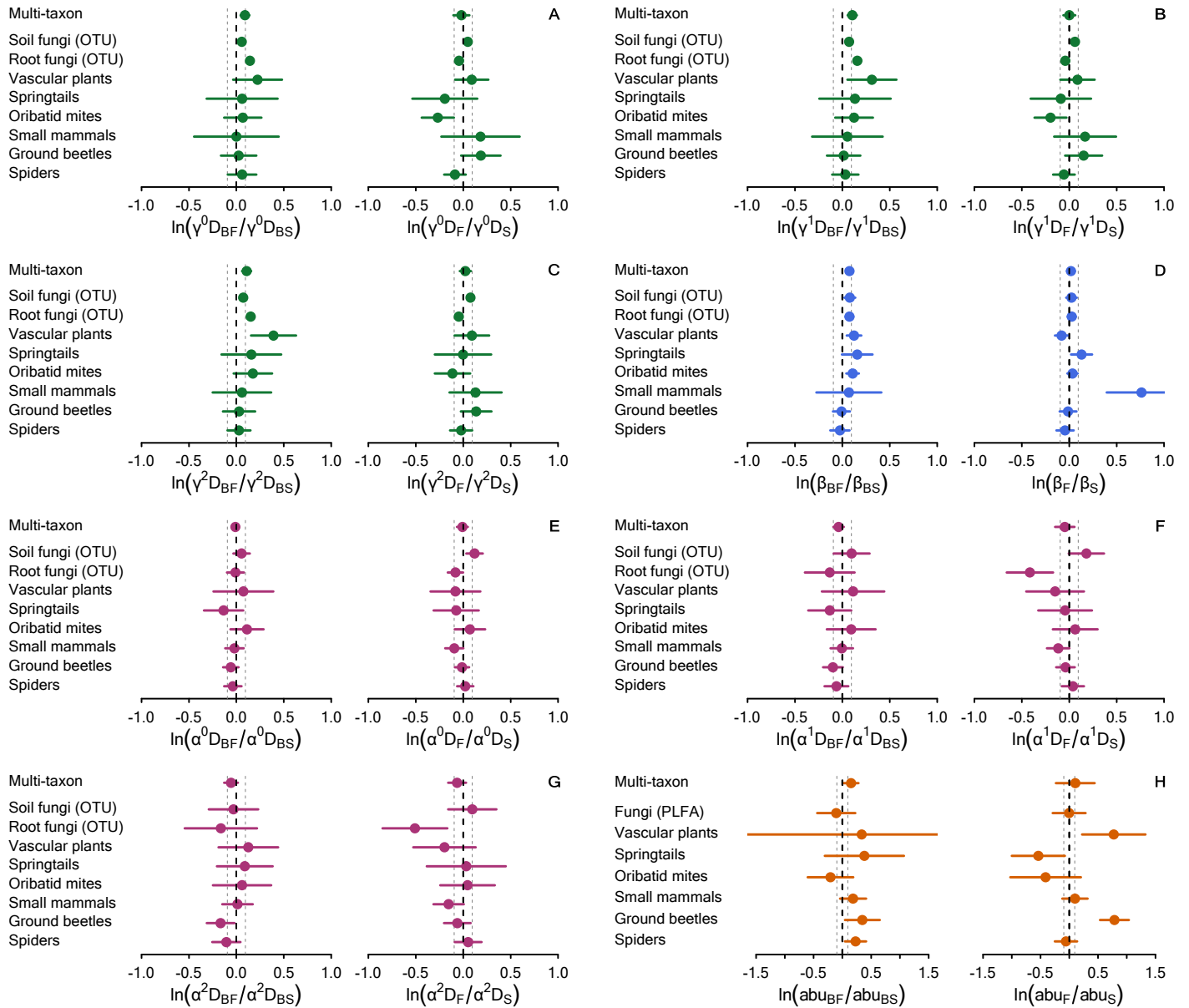


Figure S8: Relative difference in diversity and abundance of eight different forest associates between pure stands of Douglas fir and Norway spruce and between stands of each conifer mixed with European beech. Full version of Figure 3 that includes as well Shannon and Simpson diversity. The log response ratio of the target variable y is used to quantify contrasts regarding the species compositions of associated forest associates between pure or mixed Douglas fir stands (F or BF, $n = 8$) in relation to pure or mixed Norway spruce stands (S or BS, $n = 8$) ($\ln(x_F/x_S)$ or $\ln(x_{BF}/x_{BS})$). Negative values of the log response ratio indicate support of hypothesis 2 (larger values in native spruce than non-native Douglas fir stands), positive or neutral values are in opposition to hypothesis 2 (equal or larger values in non-native Douglas fir compared to native spruce). For a detailed description of the variables, see Figure S1. Note the different scale of the x-axes of the panels referring to abundances (H) or diversity (A to G).

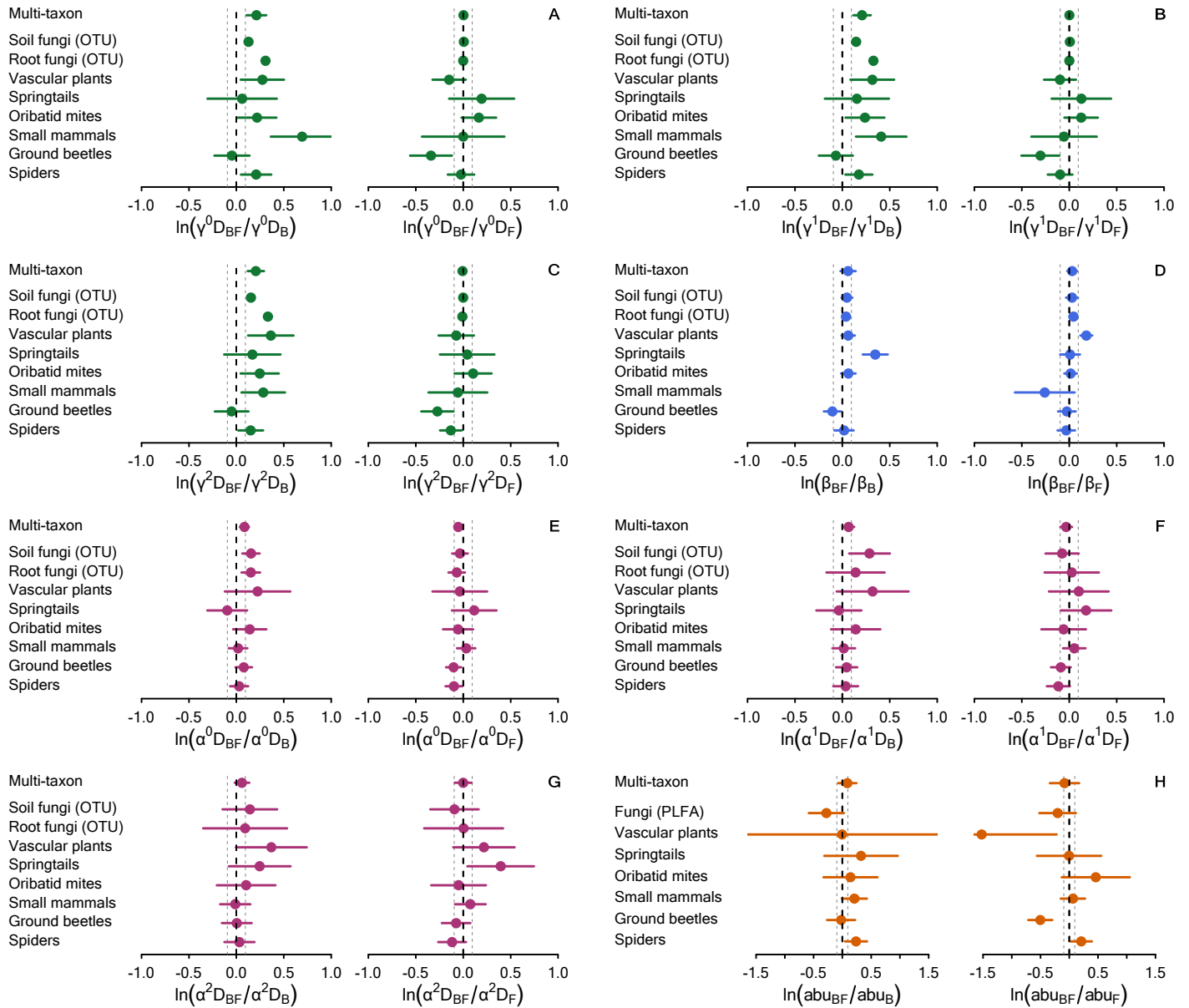


Figure S9: Relative difference in diversity and abundance of eight different forest associates between mixed and pure stands of European beech and Douglas fir. Full version of Figure 4 that includes as well Shannon and Simpson diversity. The log response ratio of the target variable y is used to quantify contrasts regarding the species compositions of associated forest associates between mixed European beech-Douglas fir stands (BF, $n = 8$) in relation to pure stands of both species (B or F, $n = 8$) ($\ln(x_{BF}/x_B)$ or $\ln(x_{BF}/x_F)$). Negative values of the log response ratio indicate support of hypothesis 3 (larger values in mixed than in pure stands), positive or neutral values are in opposition to hypothesis 3 (equal or larger values in pure than in mixed stands). For a detailed description of the variables, see Figure S1. Note the different scale of the x-axes of the panels referring to abundances (H) or diversity (A to G).

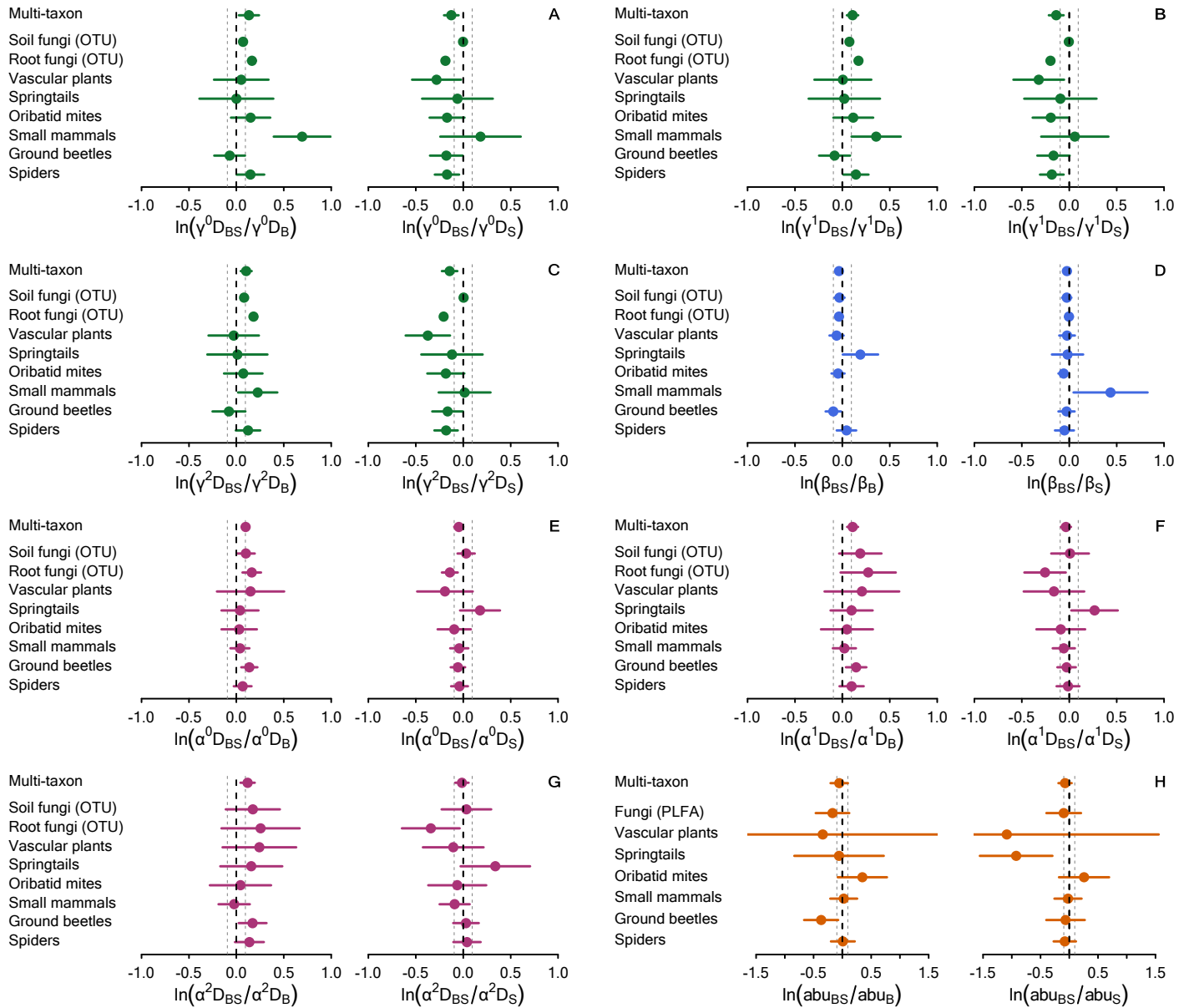


Figure S10: Relative difference in diversity and abundance of eight different forest associates between mixed and pure stands of European beech and Norway spruce. Full version of Figure 5 that includes as well Shannon and Simpson diversity. The log response ratio of the target variable y is used to quantify contrasts regarding the species compositions of associated forest associates between mixed European beech-spruce stands (BS, $n = 8$) in relation to pure stands of both species (B or S, $n = 8$) ($\ln(x_{BS}/x_B)$ or $\ln(x_{BS}/x_S)$). Negative values of the log response ratio indicate support of hypothesis 3 (larger values in mixed than in pure stands), positive or neutral values are in opposition to hypothesis 3 (equal or larger values in pure than in mixed stands). For a detailed description of the variables, see Figure S1. Note the different scale of the x-axes of the panels referring to abundances (H) or diversity (A to G).

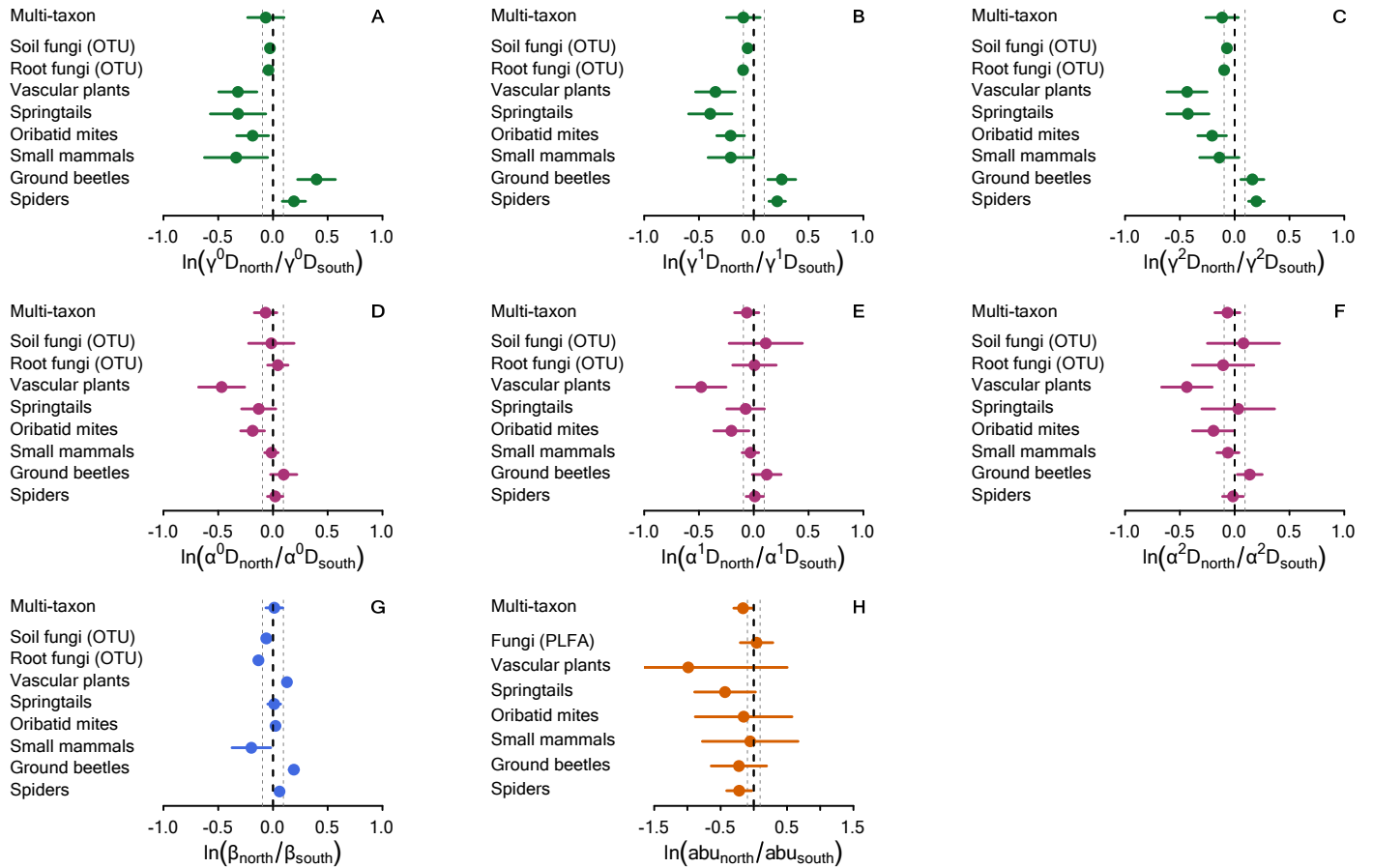


Figure S11: Relative difference in diversity and abundance of eight different forest associates between northern sites (less favorable site conditions) and southern sites (more favorable site conditions). Full version of Figure 6 that includes as well Shannon and Simpson diversity. The log response ratio of the target variable y is used to quantify average contrasts across five stand types (pure stands of Douglas fir, Norway spruce and European beech and mixed stands of European beech with each of the conifers) regarding the species compositions of associated forest associates between northern ($n = 20$) and southern ($n = 20$) sites. Negative values of the log response ratio indicate support of hypothesis 4 (larger values on sites with more favorable site conditions), positive or neutral values are in opposition to hypothesis 4 (equal or larger values on sites with less favorable site conditions). For a detailed description of the variables, see Figure S1. Note the different scale of the x-axes of the panels referring to abundances (H) or diversity (A to G).