

Supplementary Information 2

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#Species Association

Mean parameters

#SD parameters

Rho estimate

#Shannon Index

Average Shannon Index

Bumblebees Shannon plot

Hoverflies Shannon plot

Solitary bees

Convergence plot

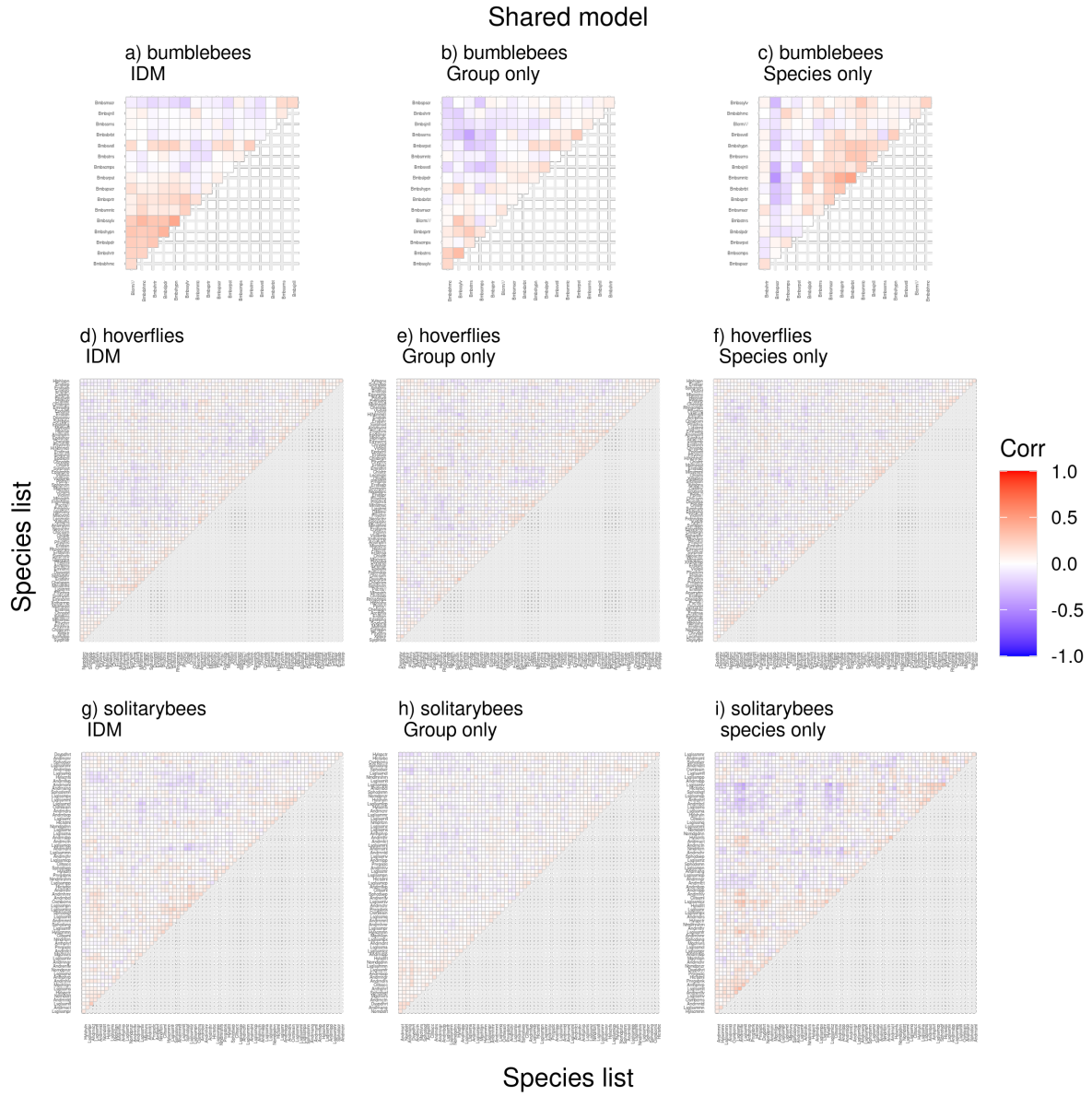


Figure 1: Species association correlation plot from the shared model. These were estimated from the variance-covariance matrix Σ of the species interaction effect defined in equations (1) and (2) in the main paper. The figure shows the values for the upper-triangular values and the species names are abbreviated to eight letters to makes the plots compact. A complete species list and abbreviations are provided in Table ...

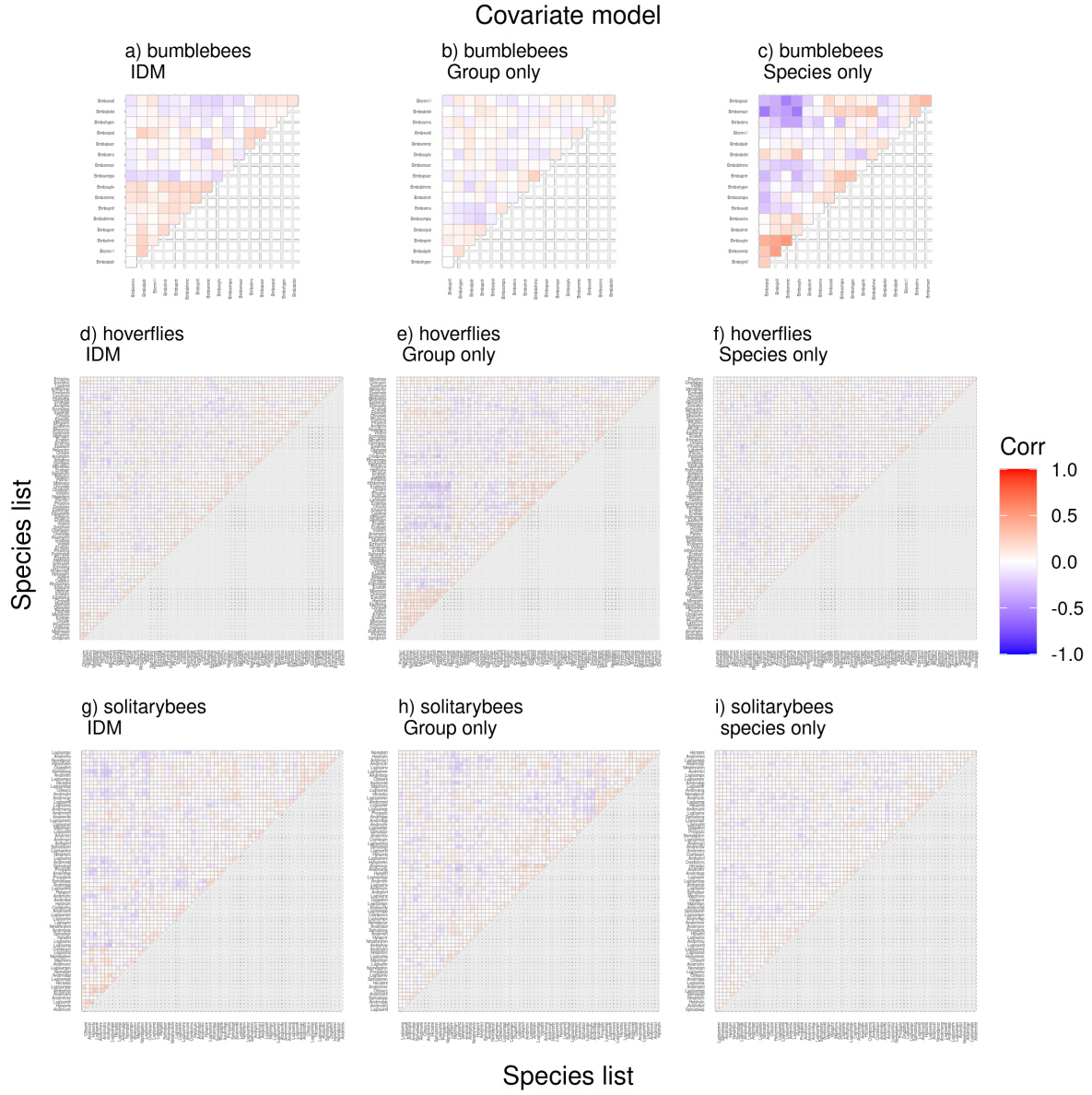


Figure 2: Species association correlation plot from the covariate model. Species association correlation plot from the shared model. These were estimated from the variance-covariance matrix Σ of the species interaction effect defined in equations (1) and (2) in the main paper. The figure shows the values for the upper-triangular values and the species names are abbreviated to eight letters to makes the plots compact. A complete species list and abbreviations are provided in Table ...

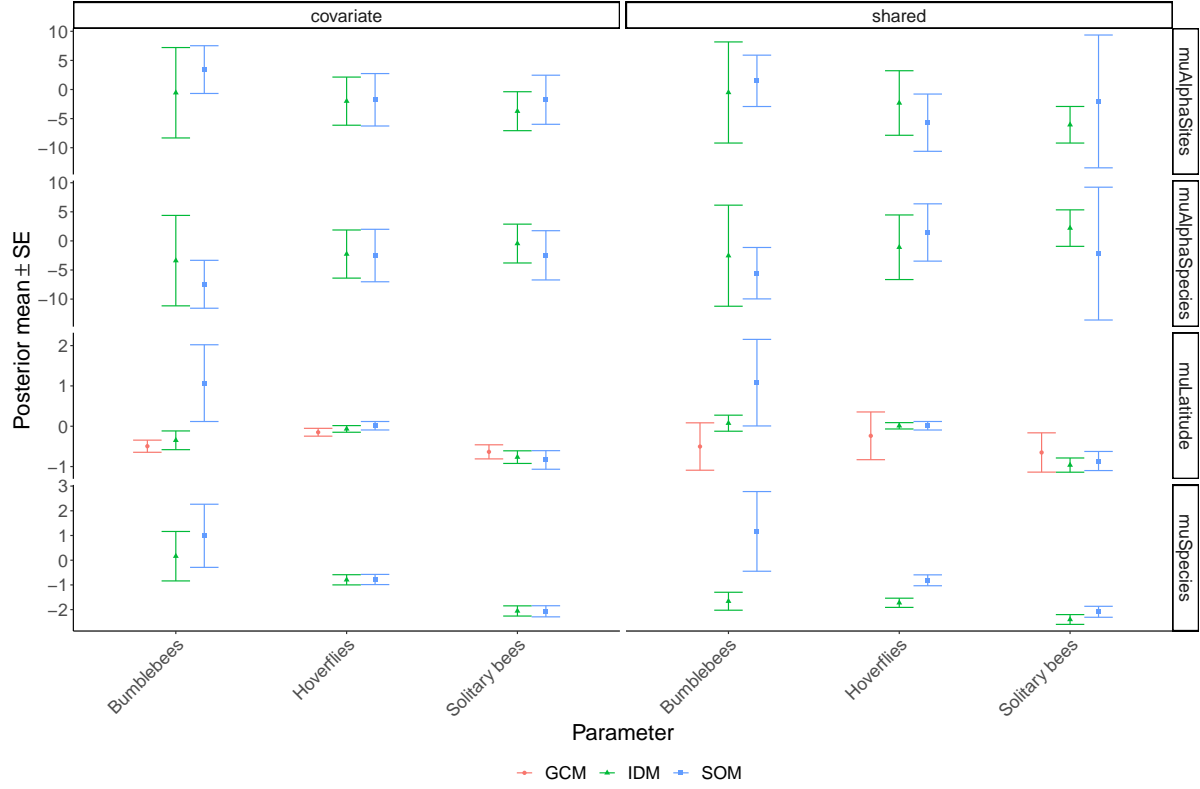


Figure 3: Error plot showing the posterior mean of mean hyperparameters (mean of the intercept (muSites), mean of latitude effect (muLatitude), mean of site effect on detection probability (muAlphaSites) and mean of species effect on detection probability (muAlphaSpecies)) in the model

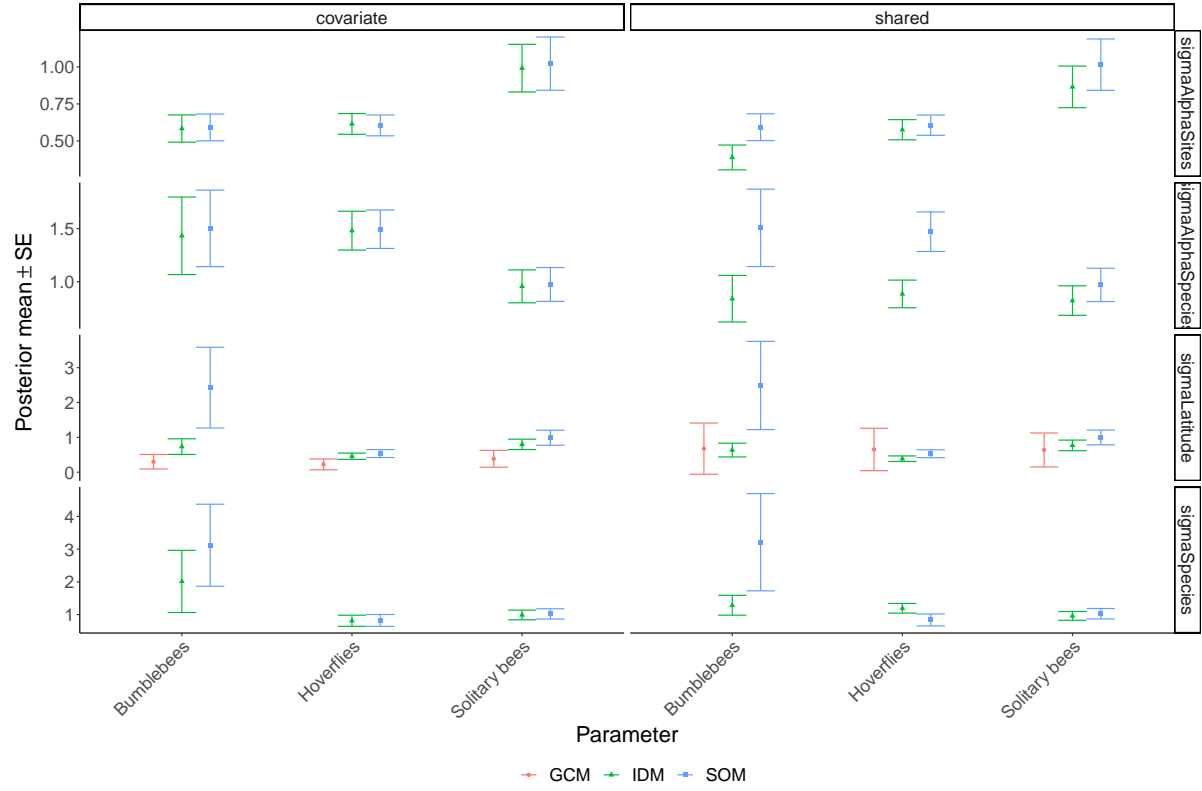


Figure 4: Error plot showing the posterior standard deviation of hyperparameters (intercept (sigmaSites), latitude effect (sigmaLatitude), site effect on detection probability (sigmaAlphaSites) and species effect on detection probability (sigmaAlphaSpecies)) in the model

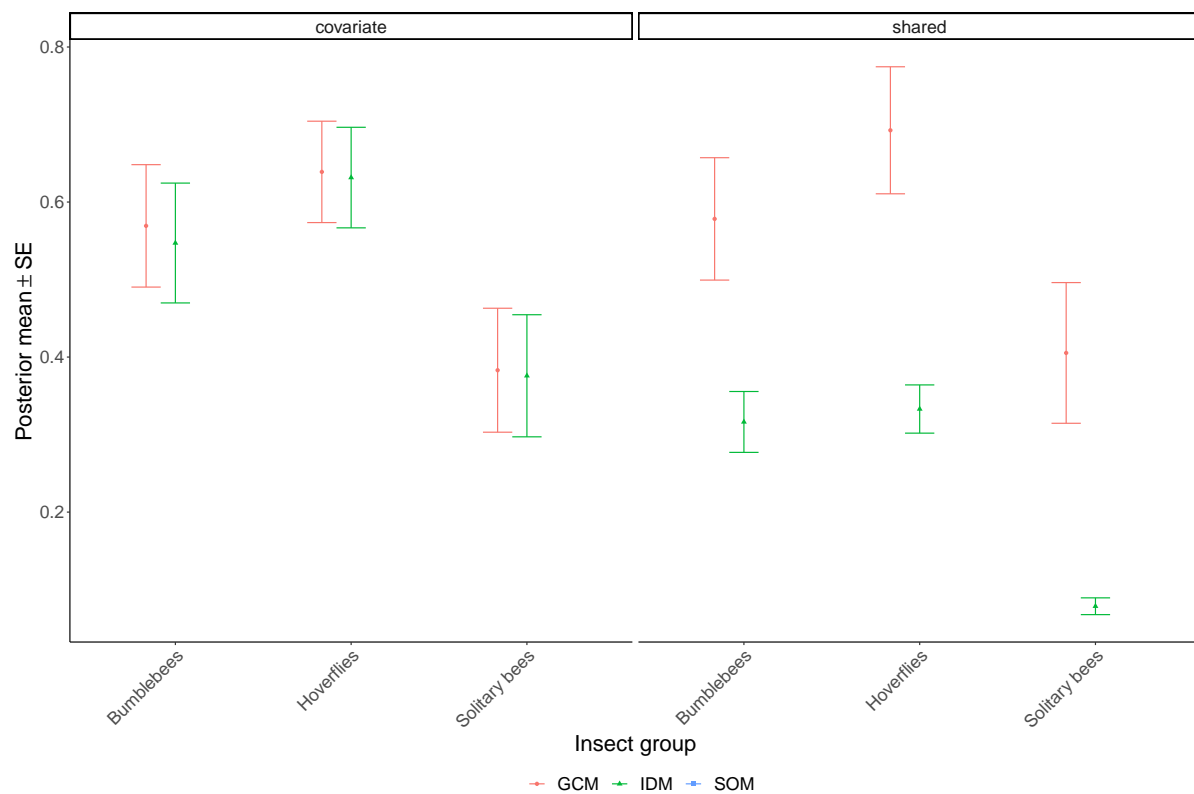


Figure 5: Error plot of the overdispersion parameter estimated from the group count model (GCM) and integrated distribution model (IDM) for all bumblebees, solitary bees and hoverflies insect groups. The error plots are faceted with the type of joint likelihood link.

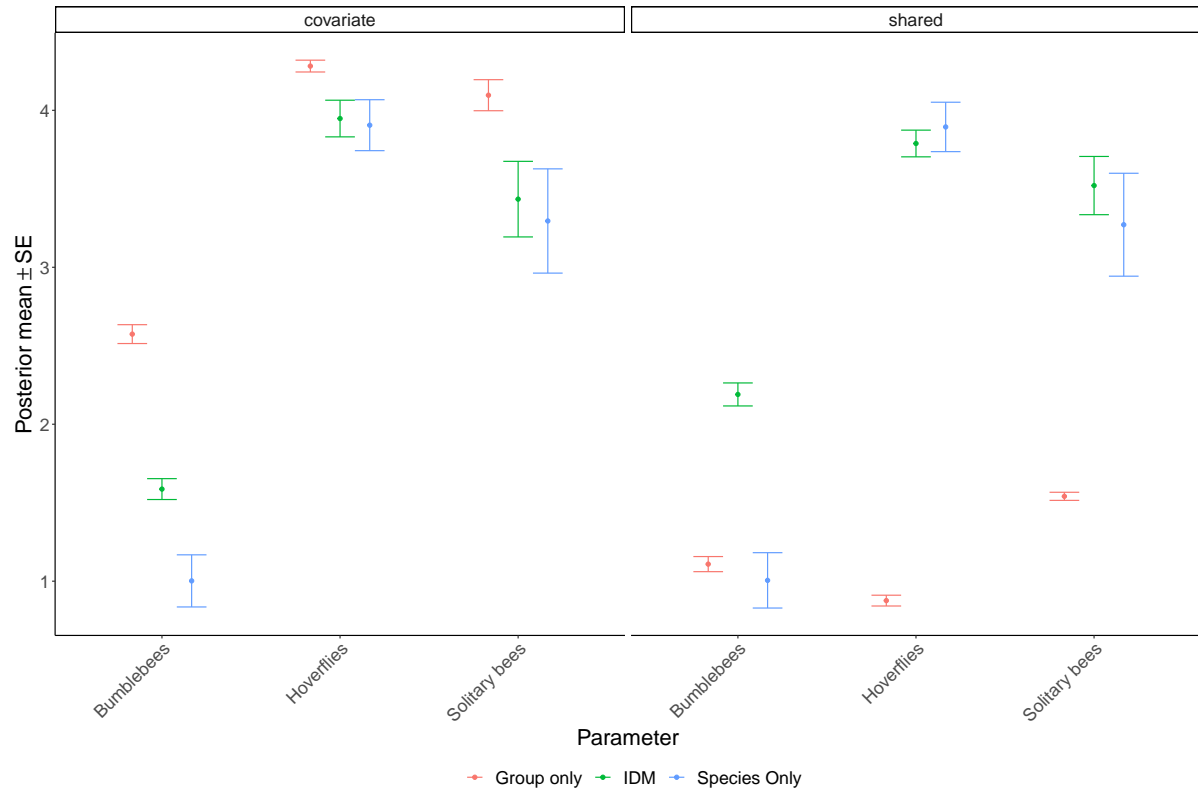


Figure 6: Error plots of average Shannon diversity index across the 74 PoMS sites. The width of the bar shows their standard deviation of the posterior average Shannon diversity of the 74 sites. The plot is faceted by the type of the joint likelihood link.

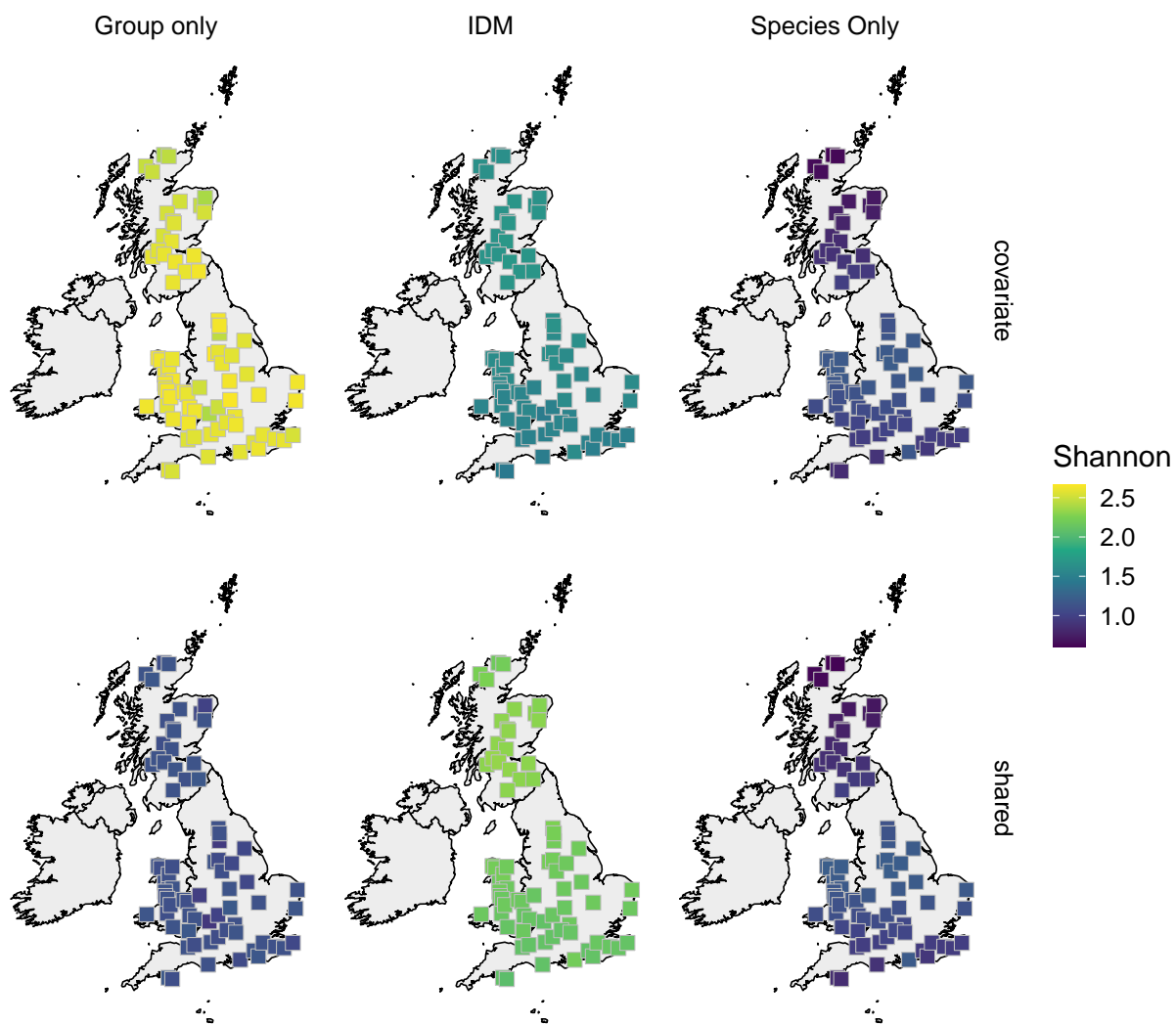


Figure 7: Posterior mean of average Shannon of Bumblebees. Add some more text

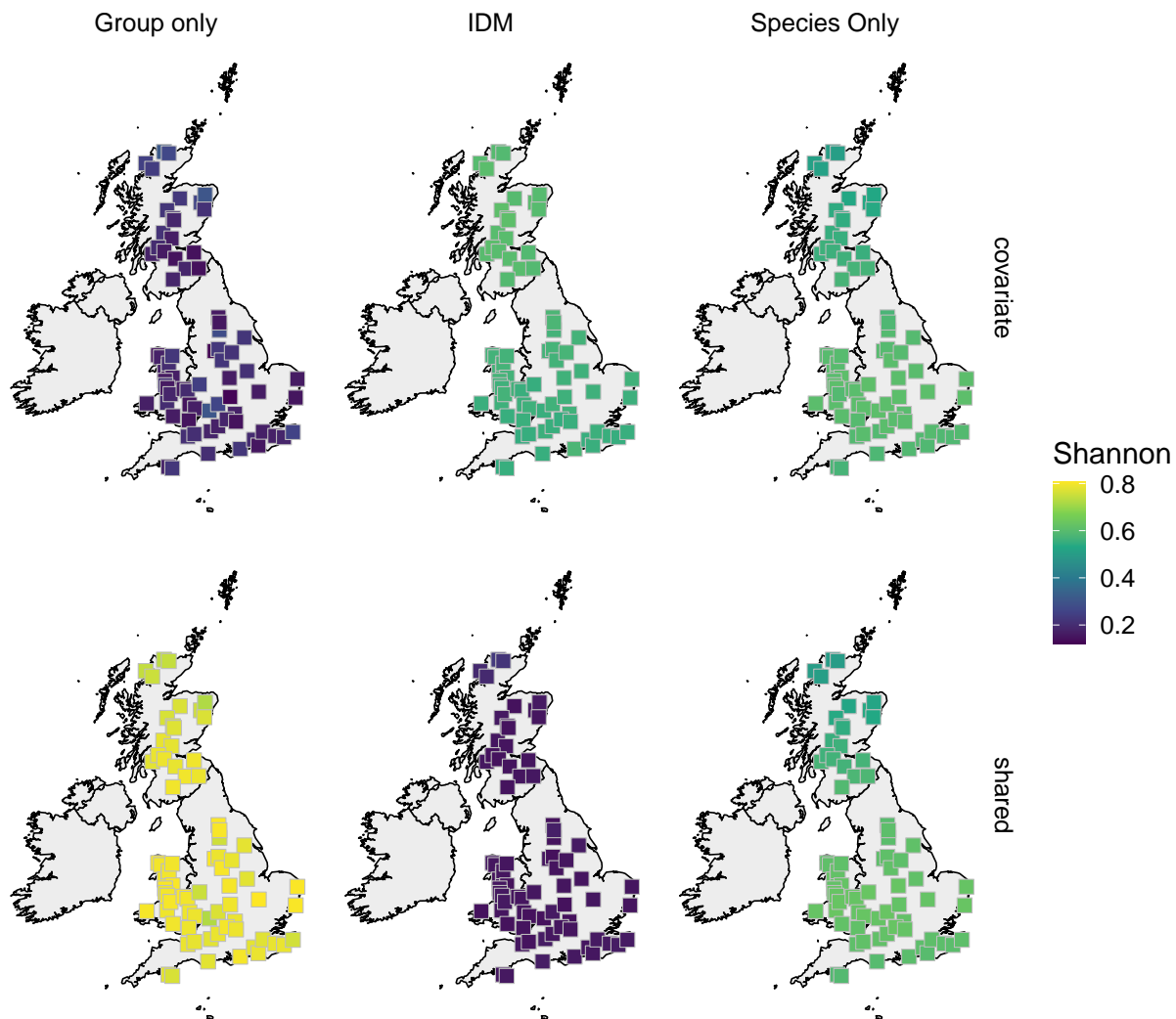


Figure 8: Posterior standard deviation of average Shannon of Bumblebees. Add some more text

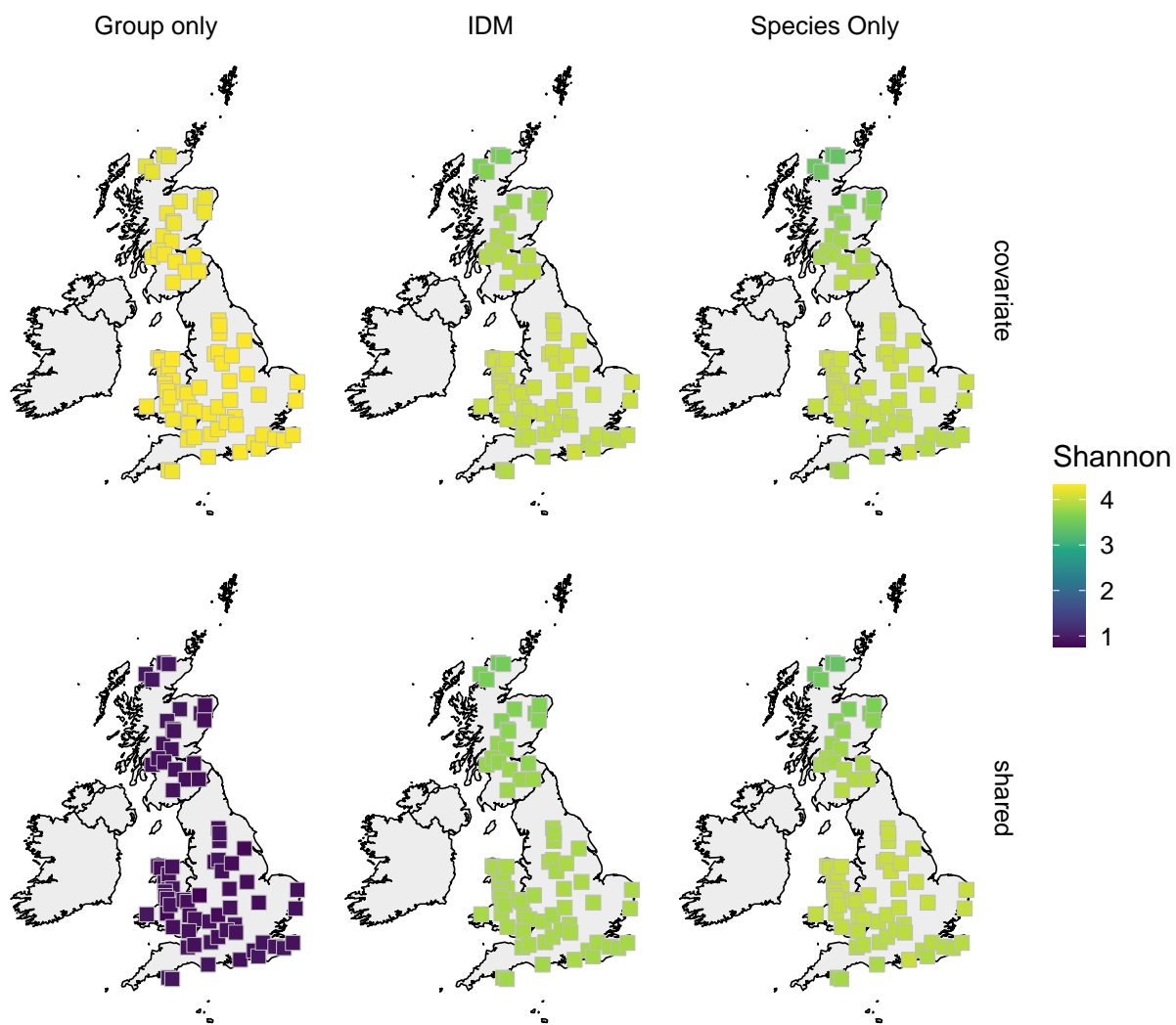


Figure 9: Posterior mean of average Shannon of hoverflies. Add some more text

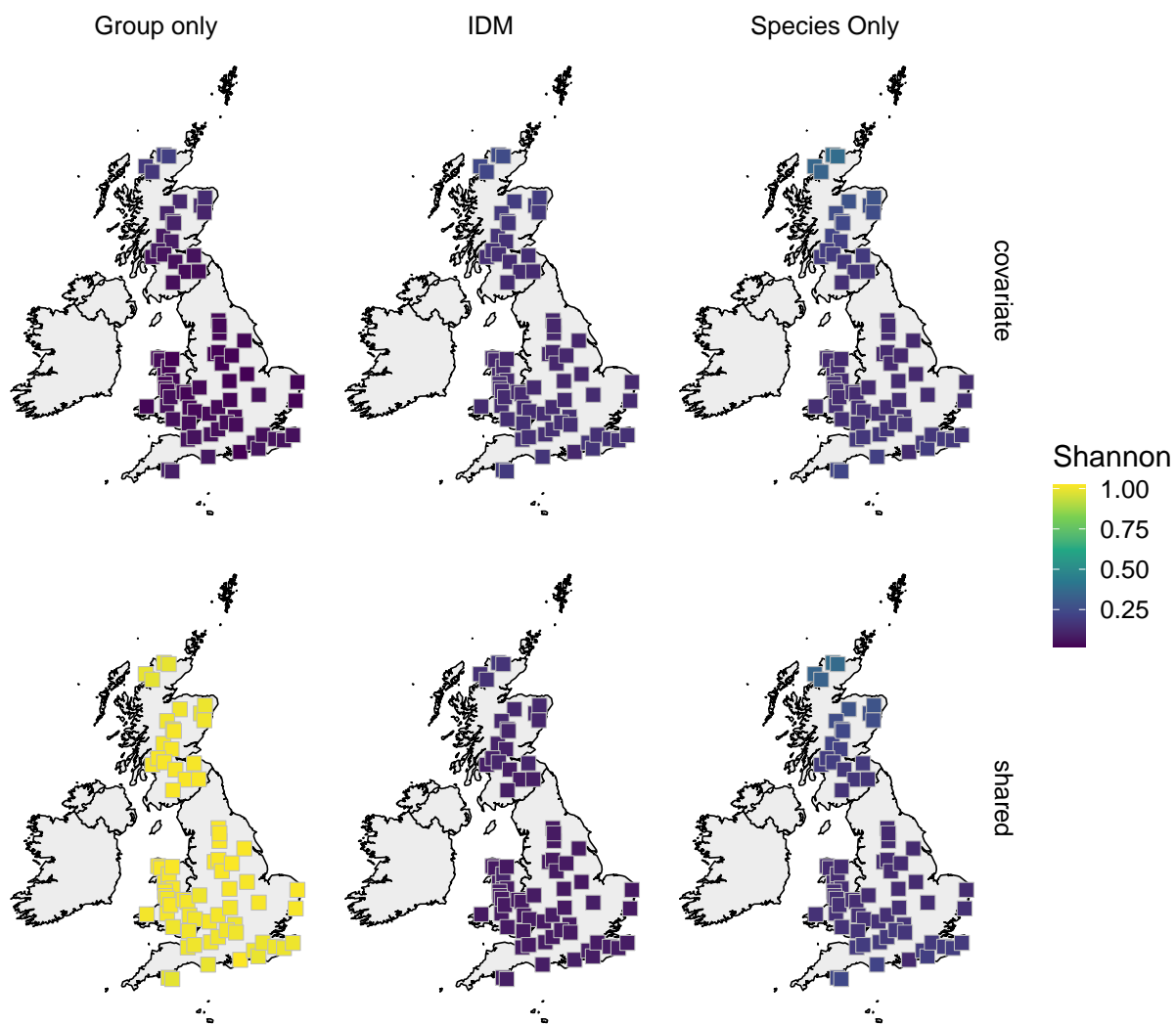


Figure 10: Posterior standard deviation of average Shannon of hoverflies. Add some more text

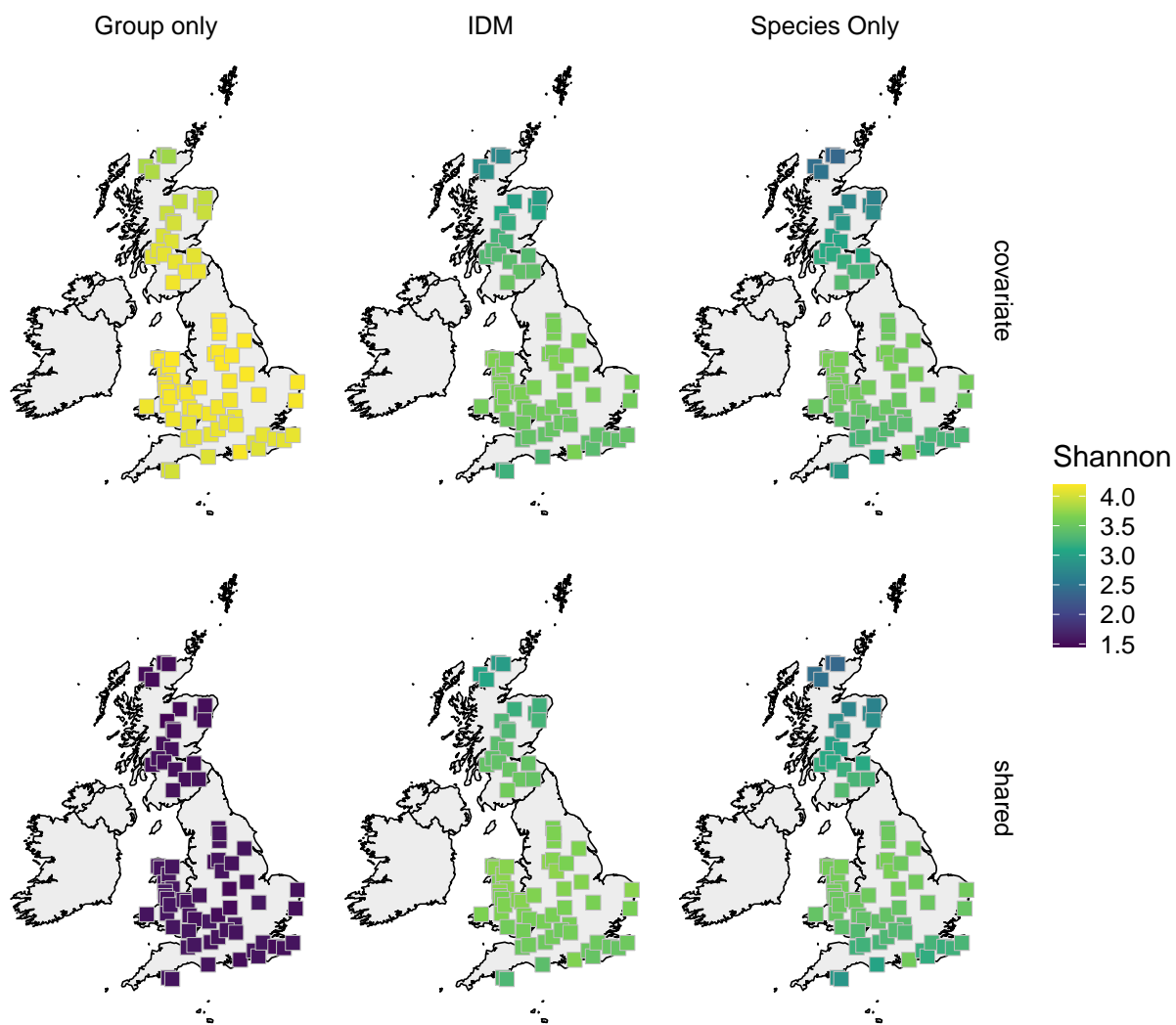


Figure 11: Posterior mean of average Shannon of solitary bees. Add some more text

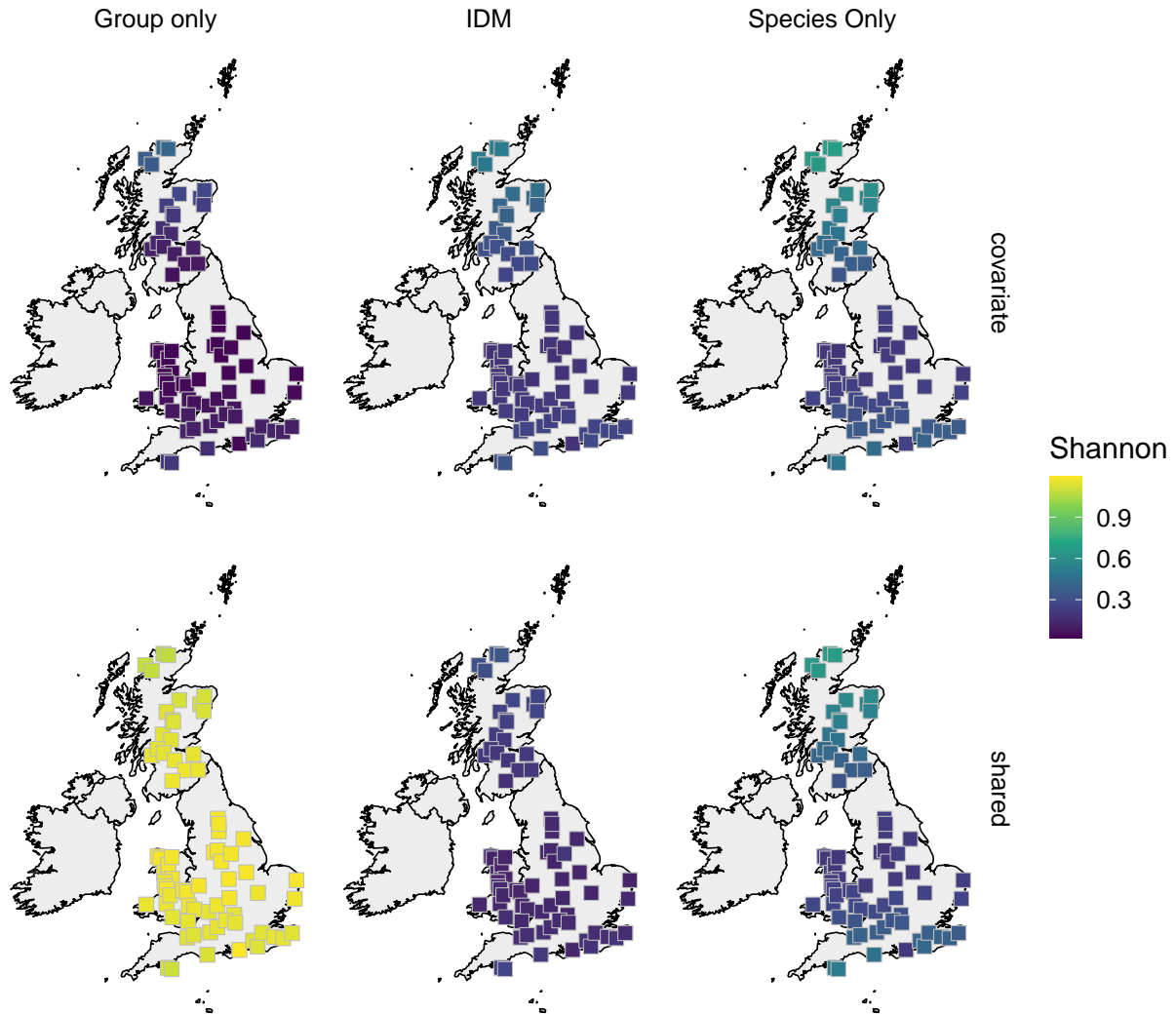


Figure 12: Posterior standard deviation of average Shannon of solitarybees. Add some more text

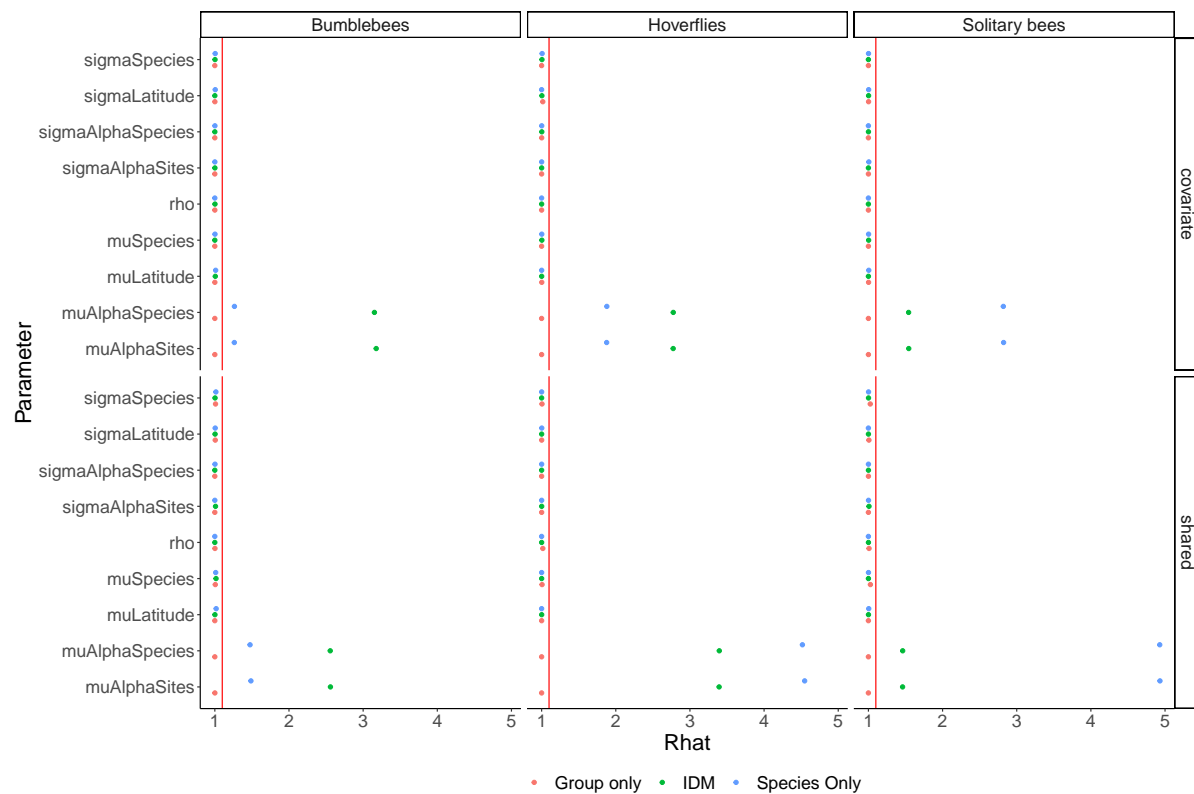


Figure 13: Rhat values parameters for Add some more text