**S.2.2 Phylogenetic Principal Component Analysis**

Table S.2.2: Output of the phylogenetic PCA. Loadings represent the correlation coefficients between each variable and the principal components. Standard deviation denotes the square root of each principal component’s eigenvalue, reflecting the amount of variance each component captures. Proportion of variance specifies the percentage of total variance explained by each component, while cumulative proportion of variance indicates the cumulative variance accounted for by the addition of each subsequent component.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **PC1** | **PC2** | **PC3** | **PC4** |
| **Variable loadings** |  |  |  |  |
| Size | -0.332 | 0.805 | -0.002 | 0.252 |
| Fecundity | 0.293 | 0.639 | 0.053 | -0.582 |
| Development time | -0.817 | 0.297 | 0.115 | 0.127 |
| Dispersal | 0.614 | 0.170 | 0.419 | -0.220 |
| Voltinism | 0.778 | 0.008 | -0.187 | 0.235 |
| Thermal mean | 0.424 | 0.345 | -0.695 | 0.248 |
| Thermal range | 0.405 | 0.161 | 0.644 | 0.506 |
|  |  |  |  |  |
| Standard deviation | 1.480 | 1.148 | 1.060 | 0.916 |
| Proportion of variance | 0.313 | 0.188 | 0.161 | 0.120 |
| Cumulative proportion of variance | 0.313 | 0.501 | 0.662 | 0.782 |