frontiers

Supplementary Material

Macroinvertebrate traits in Arctic streams reveal latitudinal patterns in physiology and habits that are strongly linked to climate

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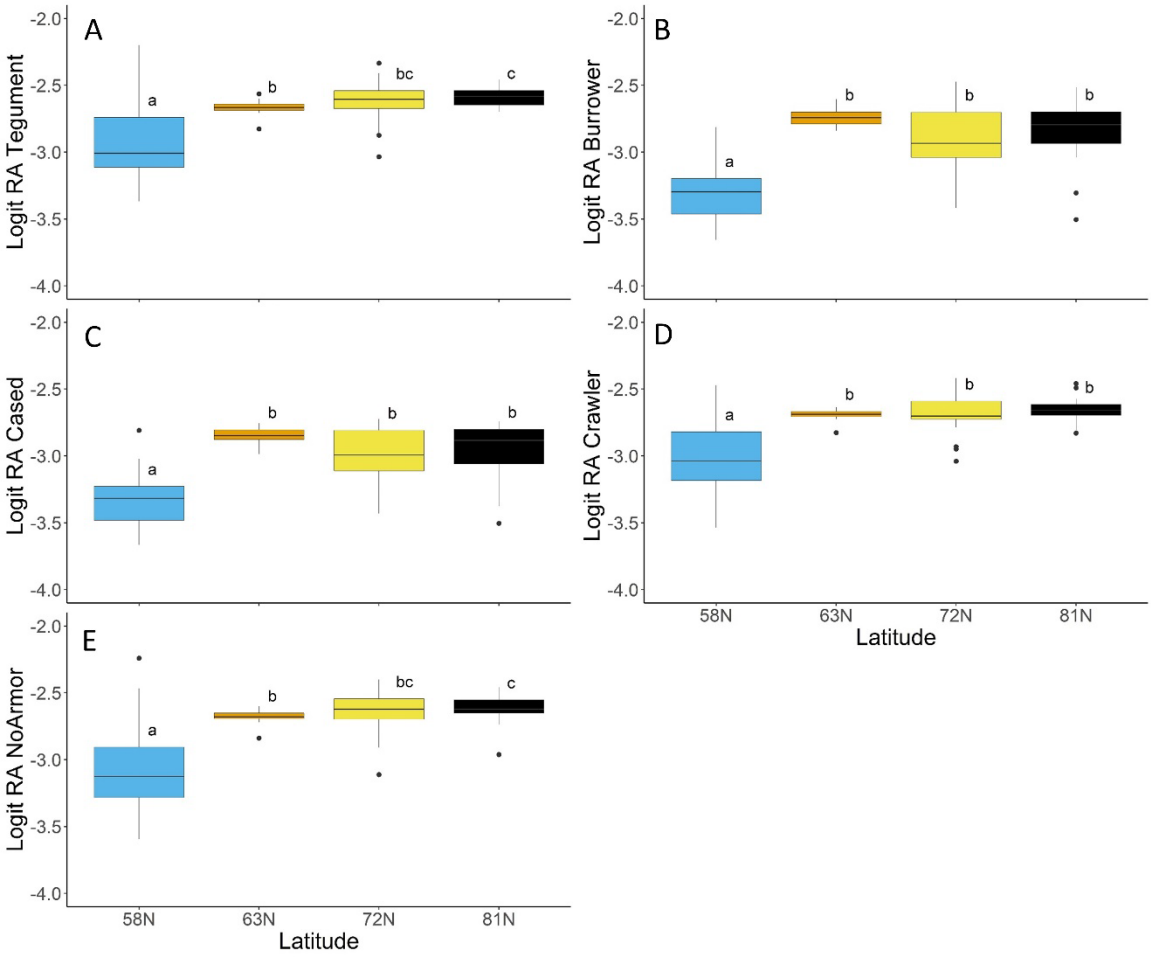
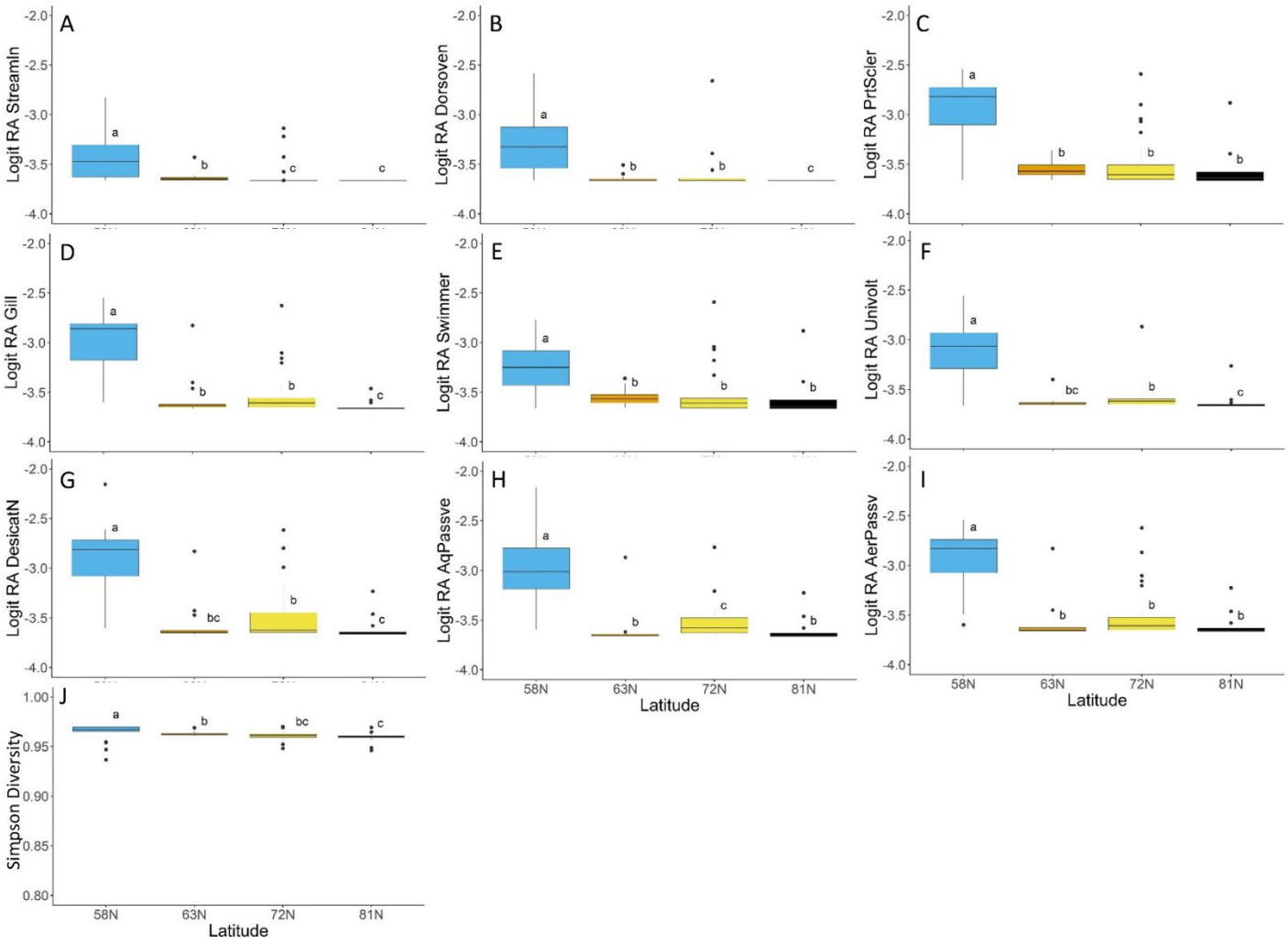
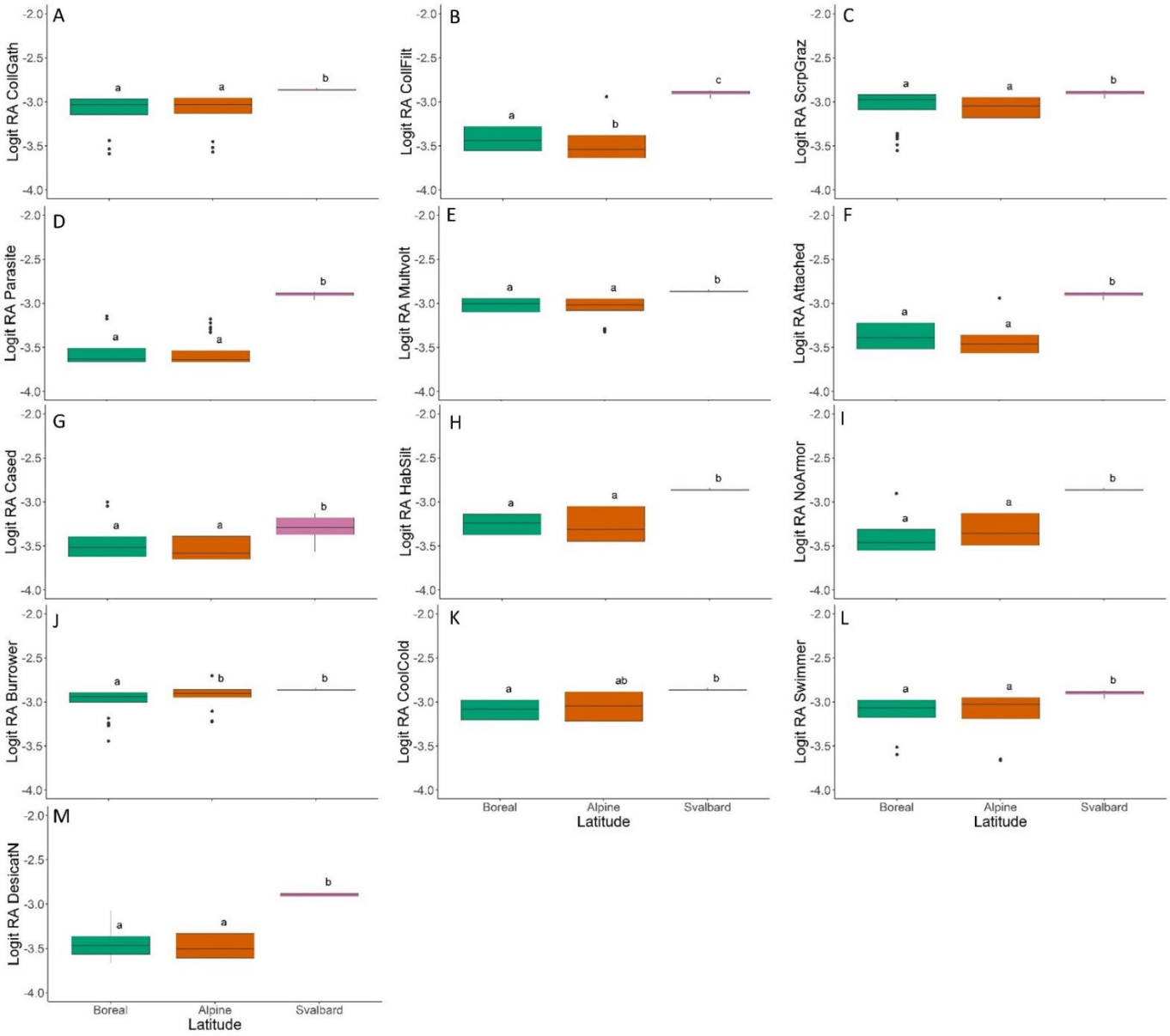
1 Supplementary Figures



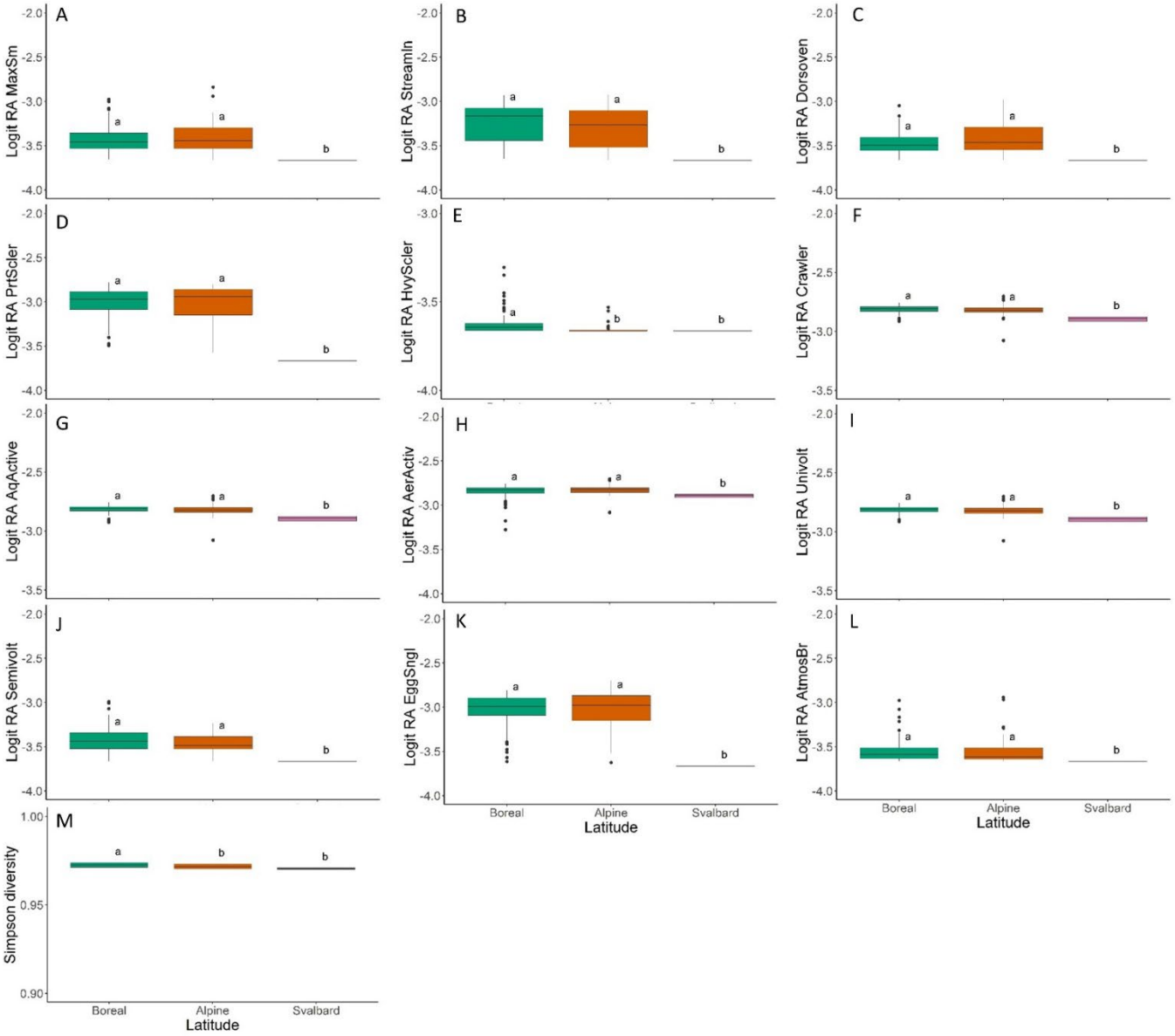
Supplementary Figure 1. Box plots showing the results of Tukey HSD post hoc analysis (or Wilcoxon pairwise tests with Bonferroni correction for non-parametric analyses) comparing trait modalities and trait diversity metrics among latitude regions for North America, including **(A)** logit-transformed relative abundance of tegument, **(B)** logit-transformed relative abundance of burrower habit, **(C)** logit-transformed relative abundance of cased habit, **(D)** logit-transformed relative abundance of crawler habit, **(E)** logit-transformed relative abundance of no armor. Letters on plots indicate statistical significance at $\alpha = 0.05$.



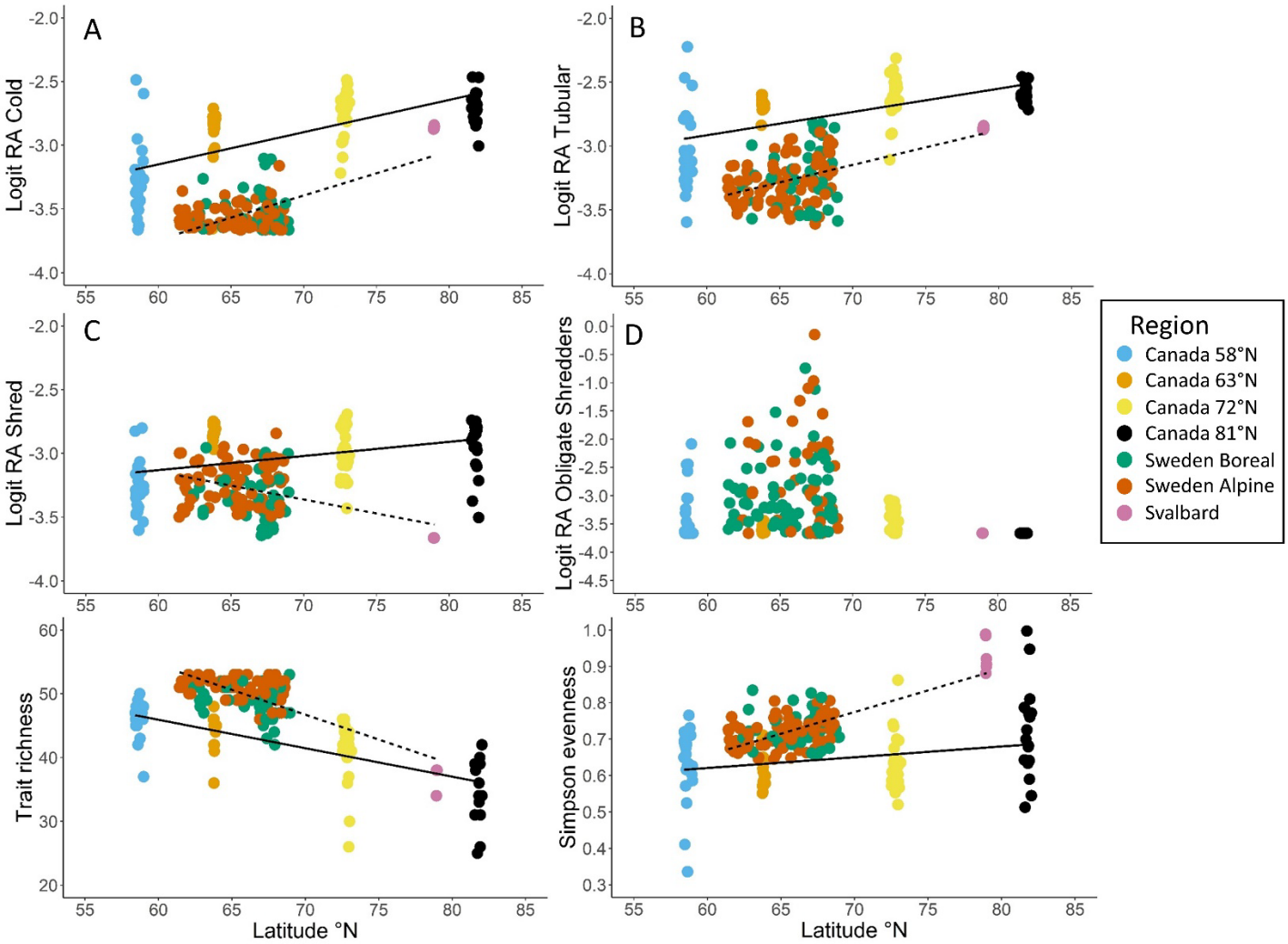
Supplementary Figure 2. Box plots showing the results of Tukey HSD post hoc analysis (or Wilcoxon pairwise tests with Bonferroni correction for non-parametric analyses) comparing trait modalities and trait diversity metrics among latitude regions for North America, including **(A)** logit-transformed relative abundance of streamlined body shape, **(B)** logit-transformed relative abundance of dorsoventrally flattened body shape, **(C)** logit-transformed relative abundance of partly sclerotized, **(D)** logit-transformed relative abundance of gills, **(E)** logit-transformed relative abundance of swimmer habit, **(F)** logit-transformed relative abundance of univoltine reproduction, **(G)** logit-transformed relative abundance of desiccation intolerance, **(H)** logit-transformed relative abundance of passive aquatic dispersal, **(I)** logit-transformed relative abundance of passive aerial dispersal, **(J)** Simpson diversity. Letters on plots indicate statistical significance at $\alpha = 0.05$.



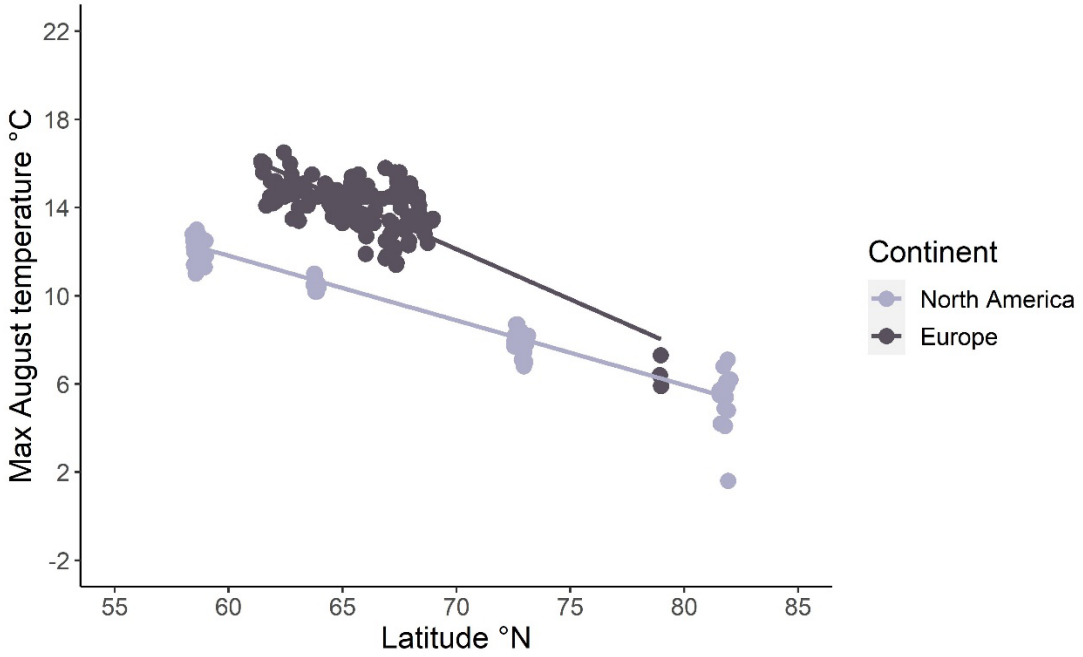
Supplementary Figure 3. Box plots showing the results of Wilcoxon pairwise tests with Bonferroni correction for non-parametric analyses comparing trait modalities and trait diversity metrics among regions for northwestern Europe, including **(A)** logit-transformed relative abundance of collector/gatherer feeding habit, **(B)** logit-transformed relative abundance of collector/filterer feeding habit, **(C)** logit-transformed relative abundance of scraper/grazer feeding habit, **(D)** logit-transformed relative abundance of parasite feeding habit, **(E)** logit-transformed relative abundance of multivoltine reproduction, **(F)** logit-transformed relative abundance of attached habit, **(G)** logit-transformed relative abundance of cased habit, **(H)** logit-transformed relative abundance of silt habitat preference, **(I)** logit-transformed relative abundance of no armor, **(J)** logit-transformed relative abundance of burrower habit, **(K)** logit-transformed relative abundance of cool/cold preference, **(J)** logit-transformed relative abundance of swimmer habit, **(J)** logit-transformed relative abundance of desiccation intolerance. Letters on plots indicate statistical significance at $\alpha = 0.05$.



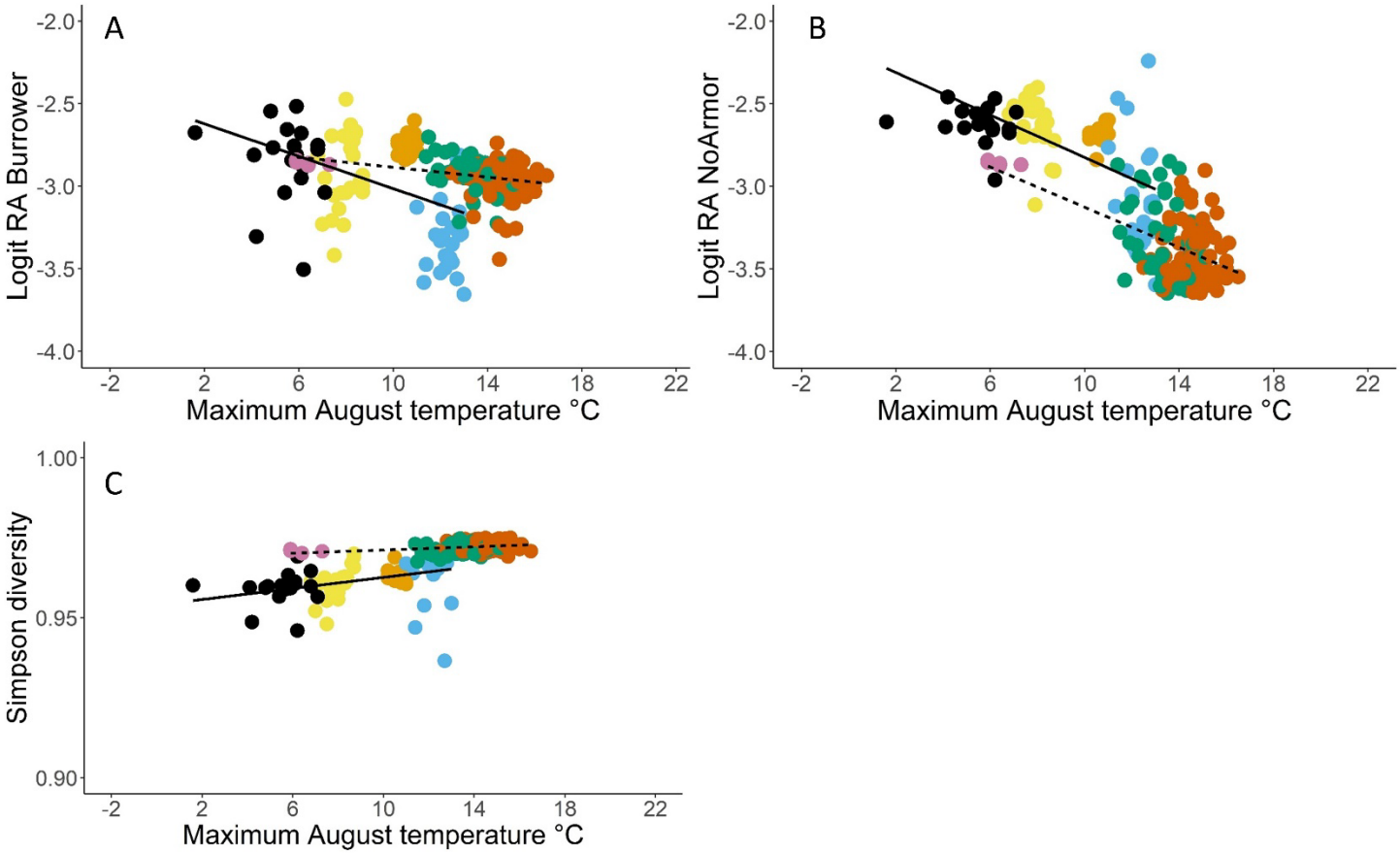
Supplementary Figure 4. Box plots showing the results of Wilcoxon pairwise tests with Bonferroni correction for non-parametric analyses comparing trait modalities and trait diversity metrics among regions for northwestern Europe, including **(A)** logit-transformed relative abundance of maximum small body size, **(B)** logit-transformed relative abundance of streamlined body shape, **(C)** logit-transformed relative abundance of dorsoventrally flattened body shape, **(D)** logit-transformed relative abundance of partially sclerotized, **(E)** logit-transformed relative abundance of heavily sclerotized, **(F)** logit-transformed relative abundance of crawler habit, **(G)** logit-transformed relative abundance of active aquatic dispersal, **(H)** logit-transformed relative abundance of aerial active dispersal, **(I)** logit-transformed relative abundance of univoltine reproduction, **(J)** logit-transformed relative abundance of semivoltine reproduction, **(K)** logit-transformed relative abundance of egg single mass, **(J)** logit-transformed relative abundance of atmospheric breather, **(J)** Simpson diversity. Letters on plots indicate statistical significance at $\alpha = 0.05$.



Supplementary Figure 5. Trait modalities and trait diversity metrics plotted as a function of latitude (°N) with separate simple linear regression lines for North America (solid) and northwestern Europe (dashed), including (A) logit relative abundance of cold tolerance, (B) logit relative abundance or tubular shape, (C) logit relative abundance of shredder feeding habit, (D) logit relative abundance of obligate shredders, (E) trait richness, and (F) Simpson evenness. Regression lines are not plotted in (D) because the obligate shredder trait was fit with rank regressions for both North America and Europe. Regions within North America and northwestern Europe are indicated by the colors of the points.



Supplementary Figure 6. Simple linear regression of long-term average maximum August air temperature (°C) on latitude (°N) for (light grey) North America and (dark grey) northwestern Europe. Separate regression lines were fit to each continent.



Supplementary Figure 7. Trait modalities and trait diversity metrics plotted as a function of long-term average (1970-2000) maximum August temperature (°C) with separate simple linear regression lines for North America (solid) and northwestern Europe (dashed), including (A) logit relative abundance of burrower habit, (B) logit relative abundance of no armor, (C) Simpson diversity. Regions within North America and northwestern Europe are indicated by the colors of the points.