Working title: Inter- and intraspecific body size patterns in individual predator-prey interactions from DNA metabarcoding

Q1: Does predator size or identity or both determine prey size?

* Approach, model selection of GLMM: log\_prey\_mass ~ log\_pred\_mass\*species + 1|sample
  + Interaction model: the slope and intercept of prey~pred\_mass changes by species
  + Mass + species model: the intercept changes by species, slope is invariant
  + Mass: species doesn’t matter
  + Species: mass doesn’t matter
* Results: best model is Mass + species model: species identity just shifts the intercept of a similar slope. The slope is promising in using as a predictive way for building feeding interactions without knowing them.
* Figures:
  + Ggeffects graph of log-log size by species
  + size distributions of predators and prey (by species for preds?)
* Inspiration: Brose et al. 2019, Rudolf et al. 2014, Woodward and Hildrew 2002

Q2: Within a shared environment, does predator size or identity determine prey identity?

* Approach: subset predators from one canopy fog, RDA: prey community composition ~ log\_pred\_mass + species\_identity
* Results: Predator identity is the largest driver here, and very little contribution of predator size
* Figures:
  + pretty RDA plus body size distribution of the predators from this environment
  + Euler plot showing the amount of variation explained by each
* Inspiration: Woodward and Hildrew 2002, Rudolf et al. 2014
* Collinearity problem with size and PHH – still significant w/o PHH
* Kyle idea: within species z-score of body size as a predictor rather than raw body size

Q3: Within a species, do smaller individuals eat a subset of the prey of larger individuals (e.g. nestedness)?

* As QC here, show species accumulation of prey species for these three predator species
* Approach: nestedness analyses in vegan based on Jaccard similarity and NDOF nestedness
* Results: no clear nestedness in these predators (still waiting on QC of species accumulation)
* Figures:
  + matrices w/o nestedness pattern
  + species accumulations of prey reads in these predator species
  + example “food webs” with and without nested pattern
* Inspiration: Woodward and Hildrew 2002