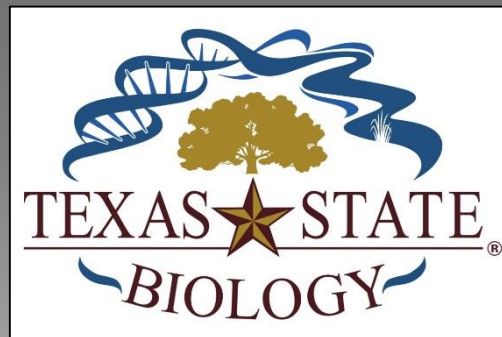


# Evaluation of the trophic status and functional feeding group status of the Comal Springs riffle beetle

Dr. Weston Nowlin

and

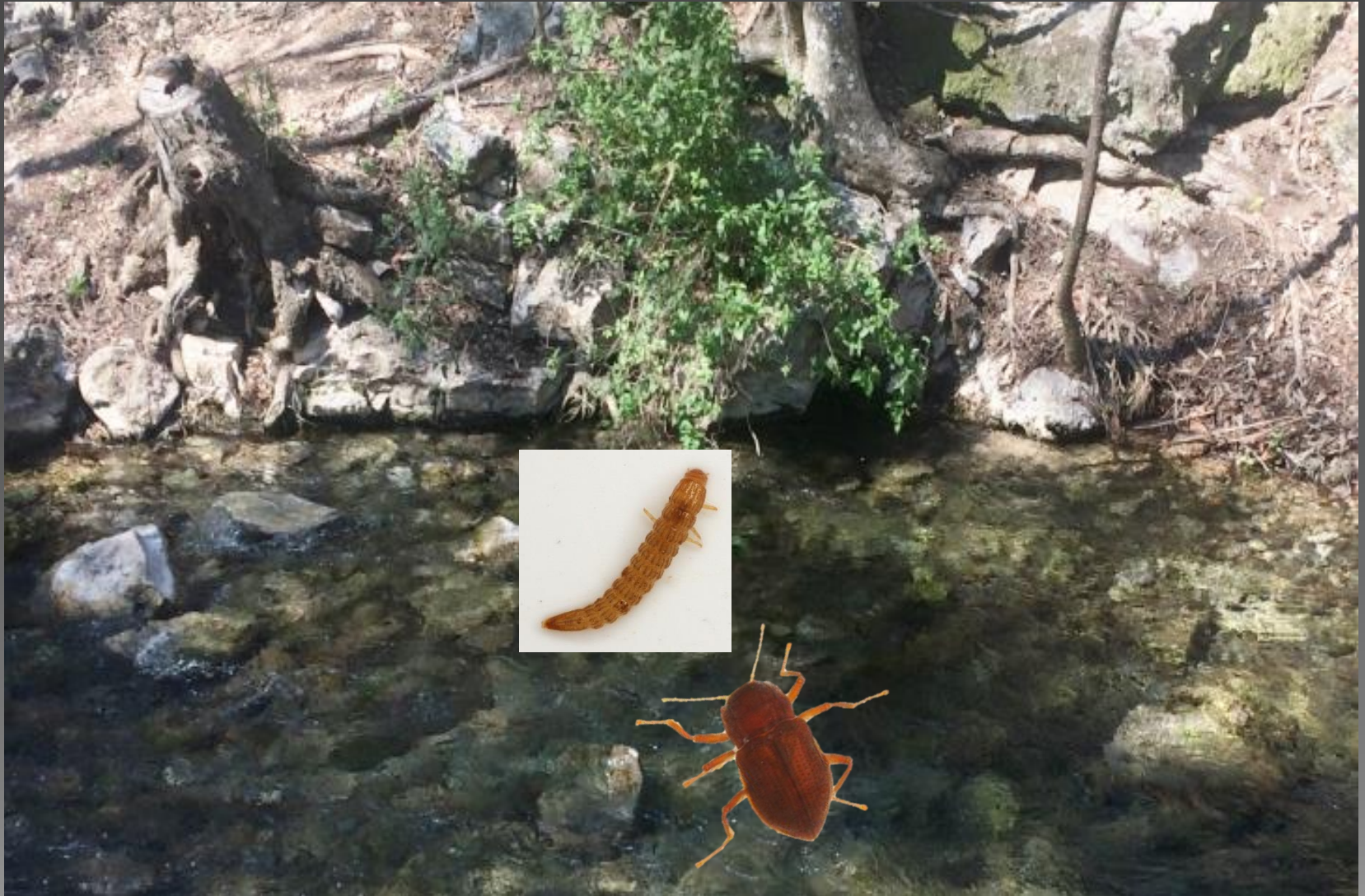
Dr. Dittmar Hahn



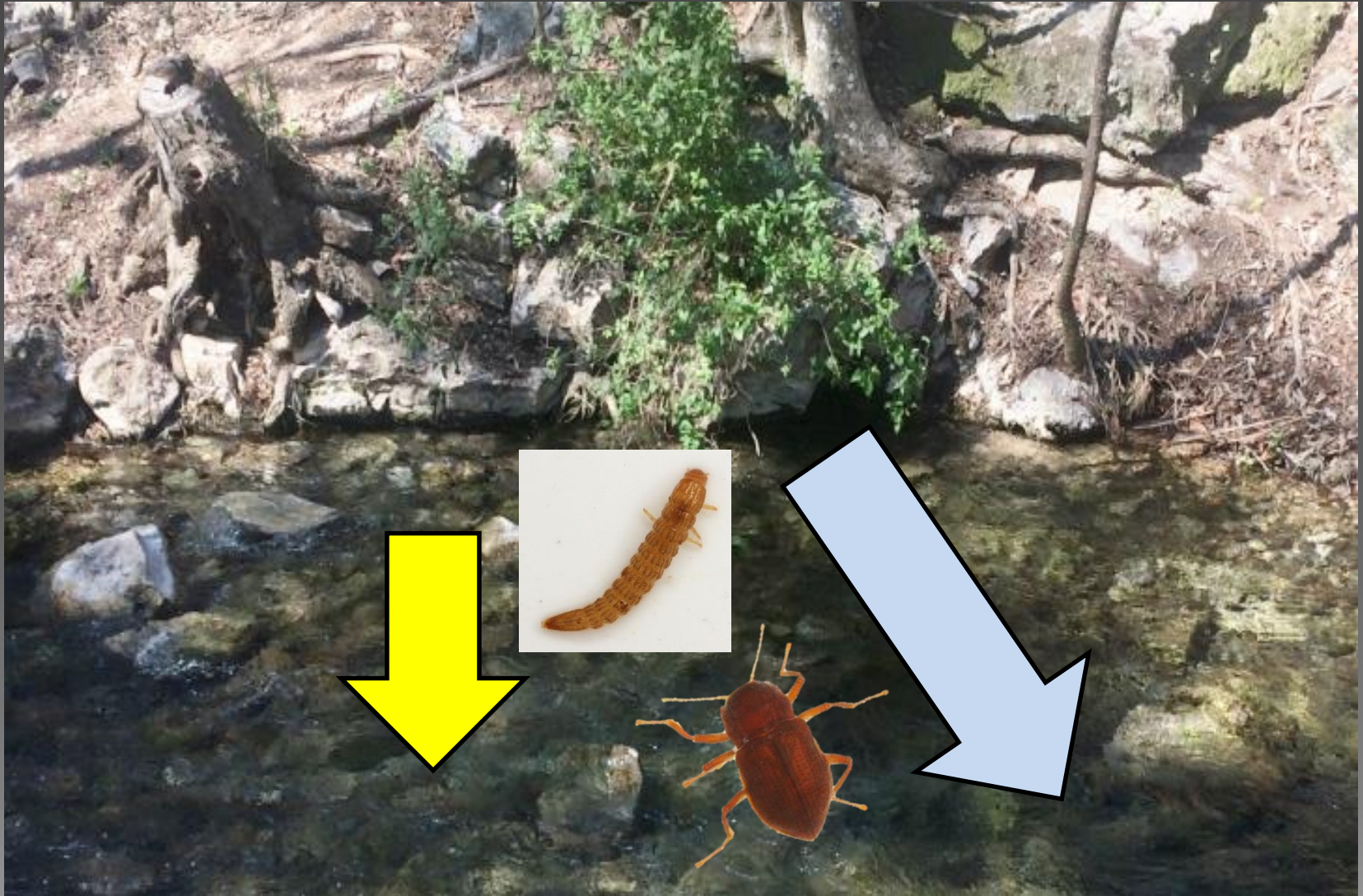
# Background

- *H. comalensis* listed in the EA-HCP
  - Flow conditions should consider this organism
- Requires specific features and/or habitat characteristics for growth and reproduction

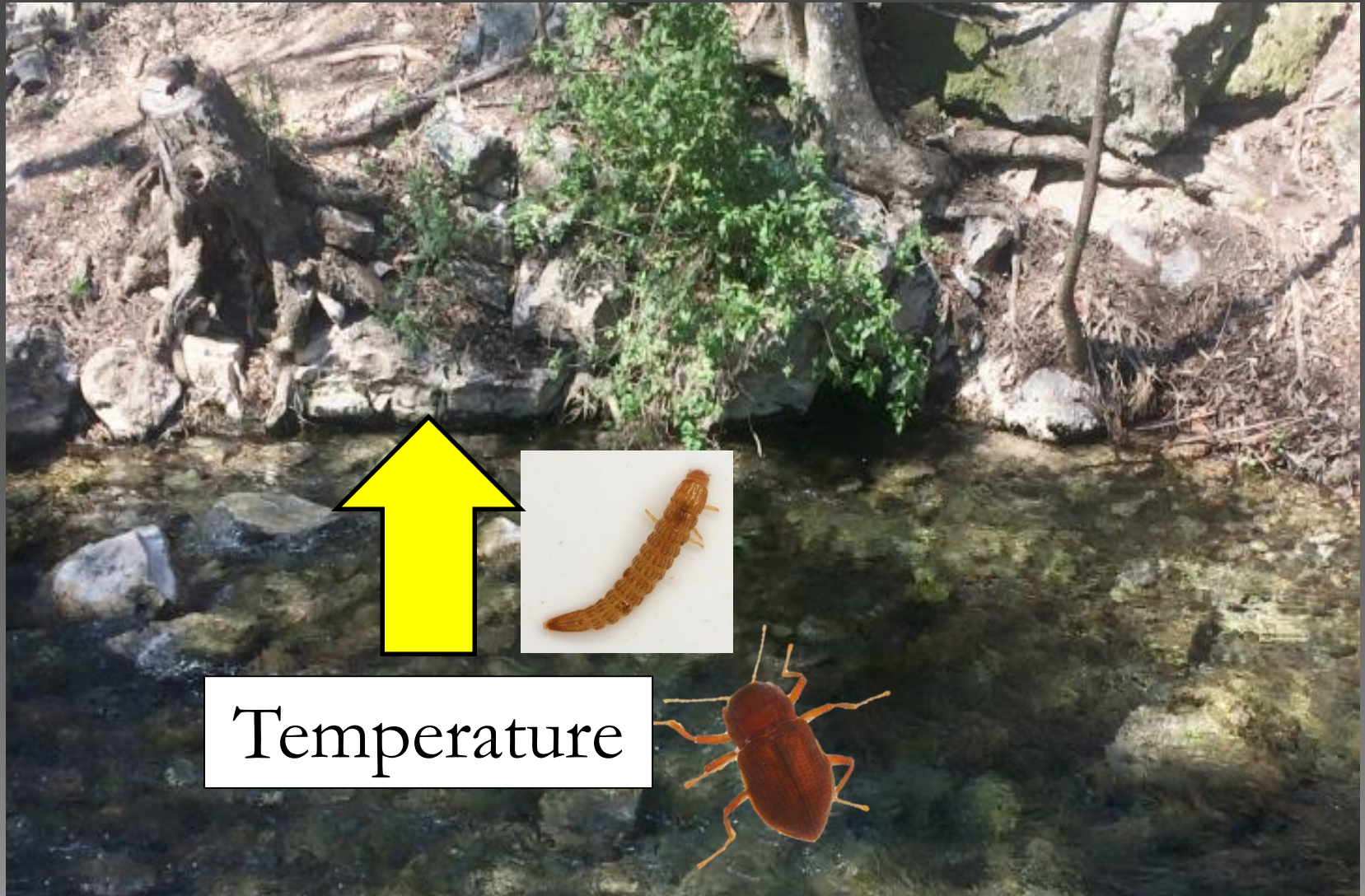
# CSRB and Spring Association



# CSRB and Spring Association

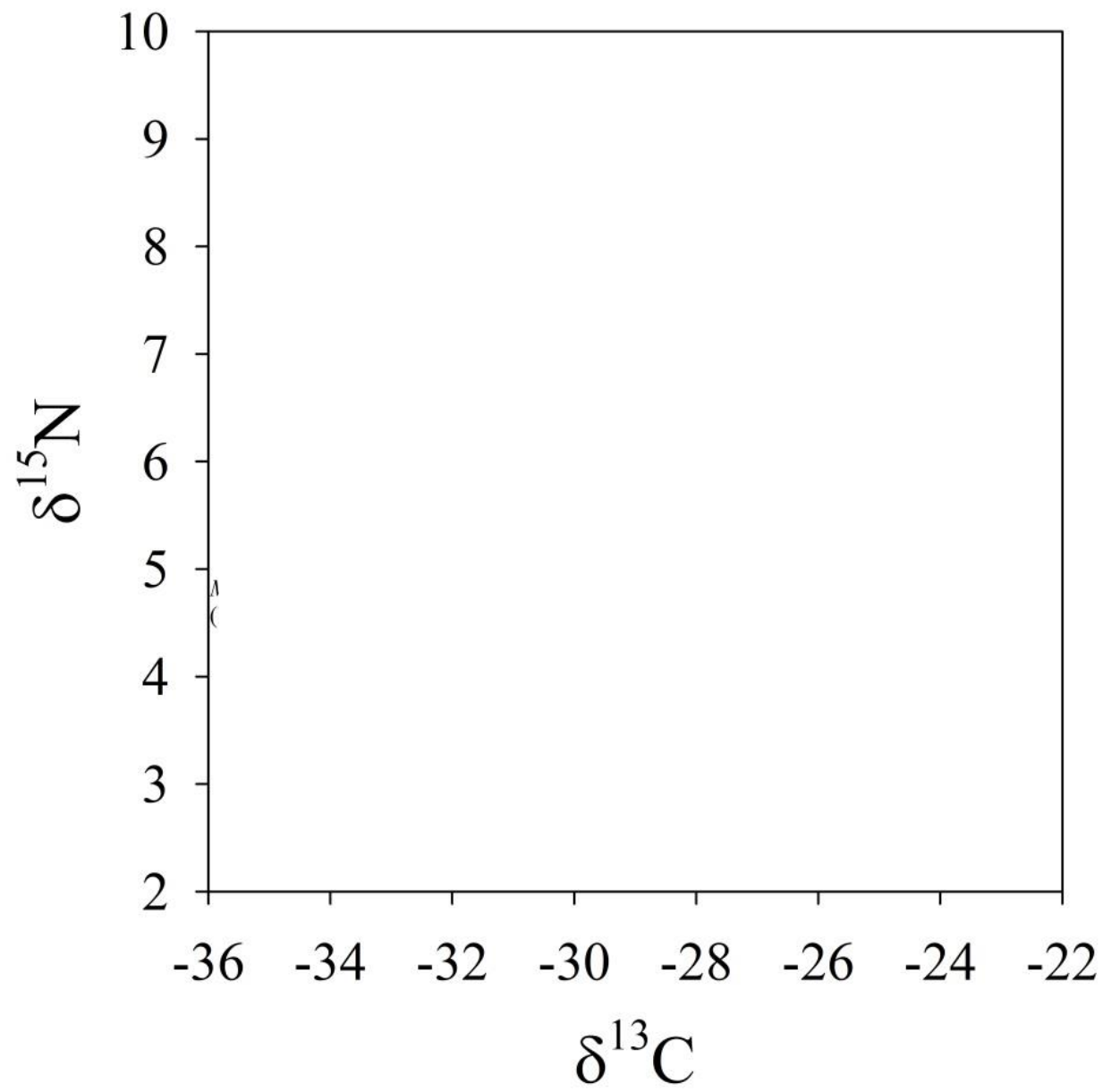


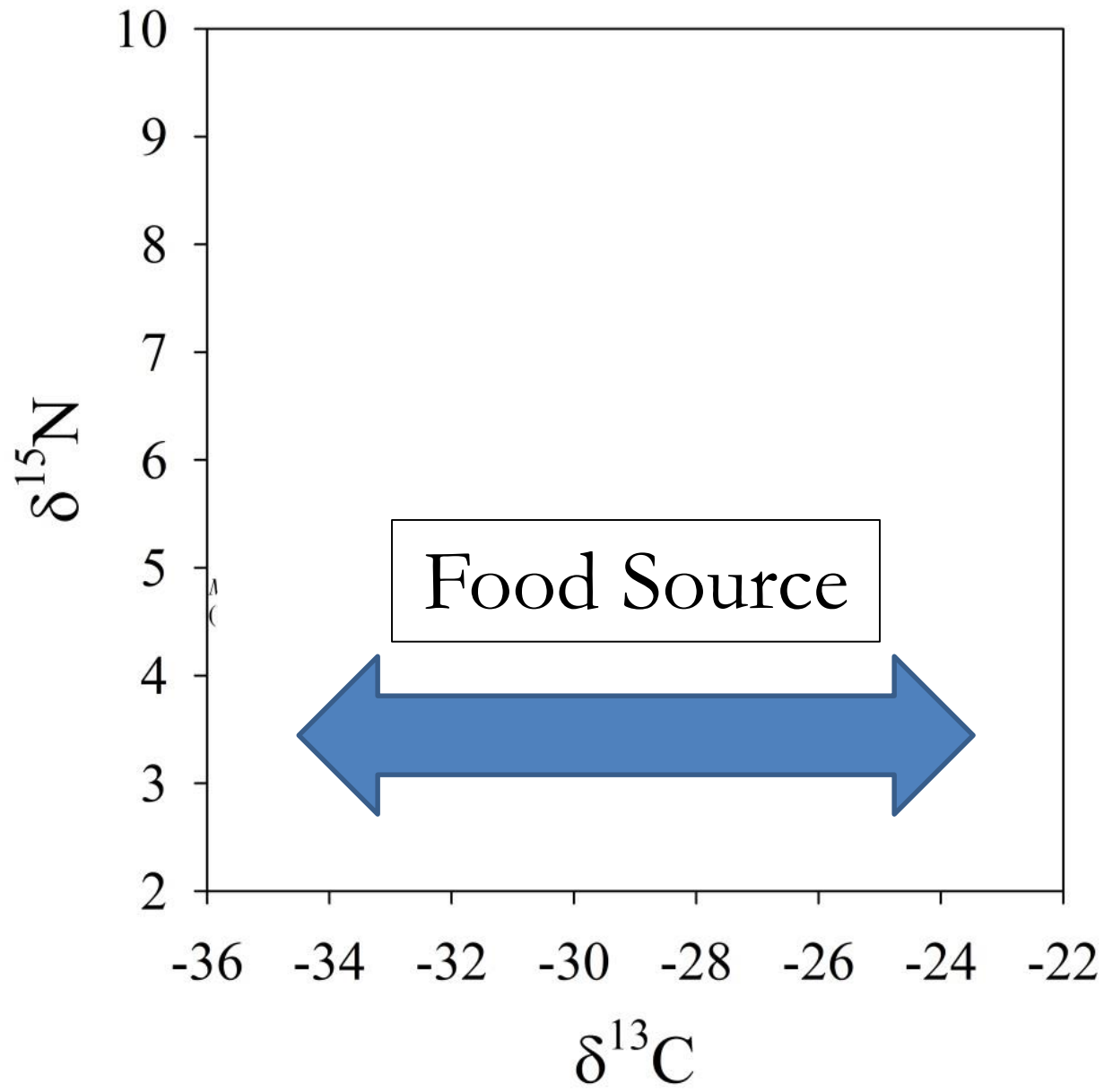
# CSRB and Spring Association



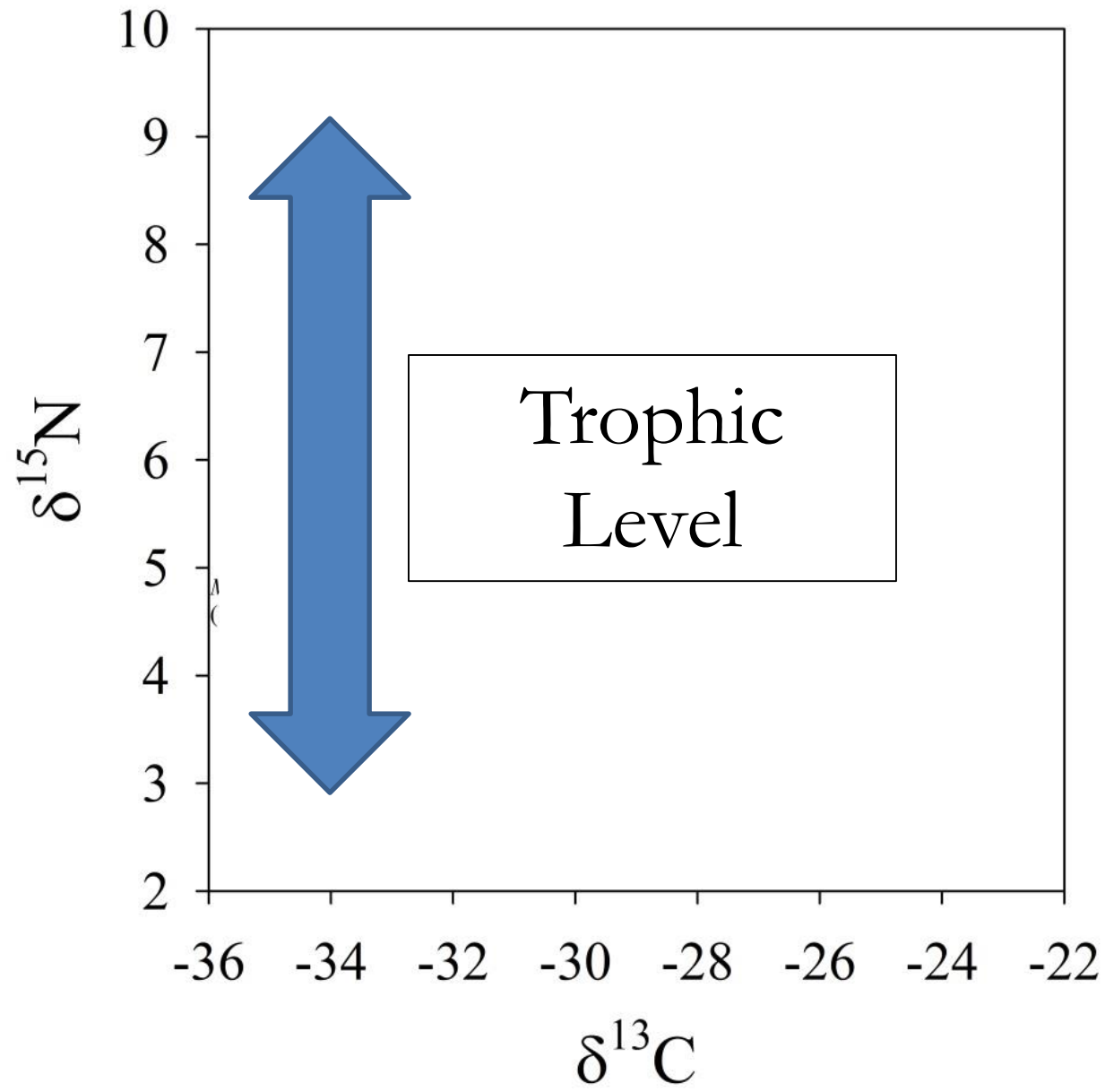
# CSRB and Woody Debris/CPOM

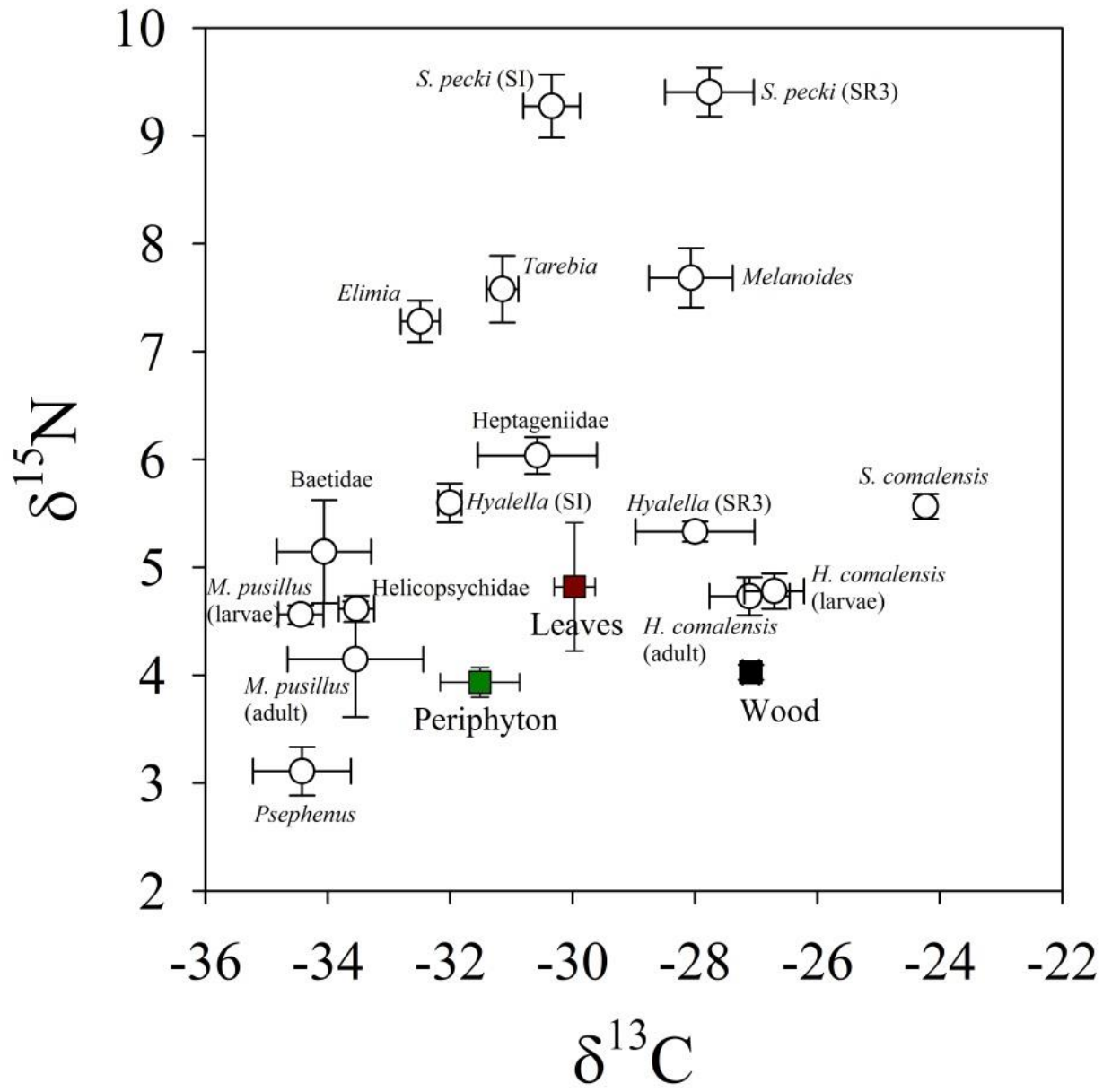


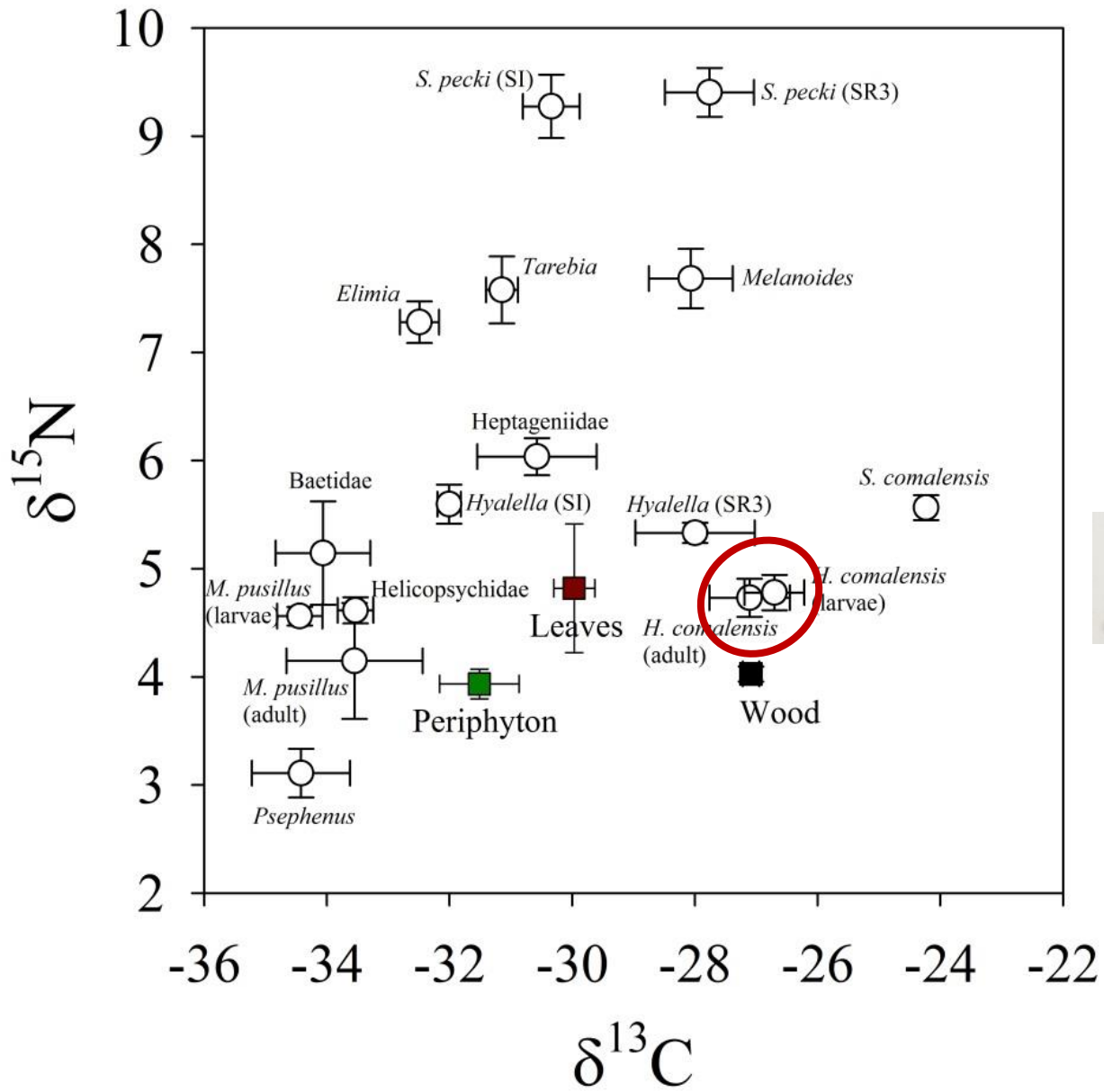


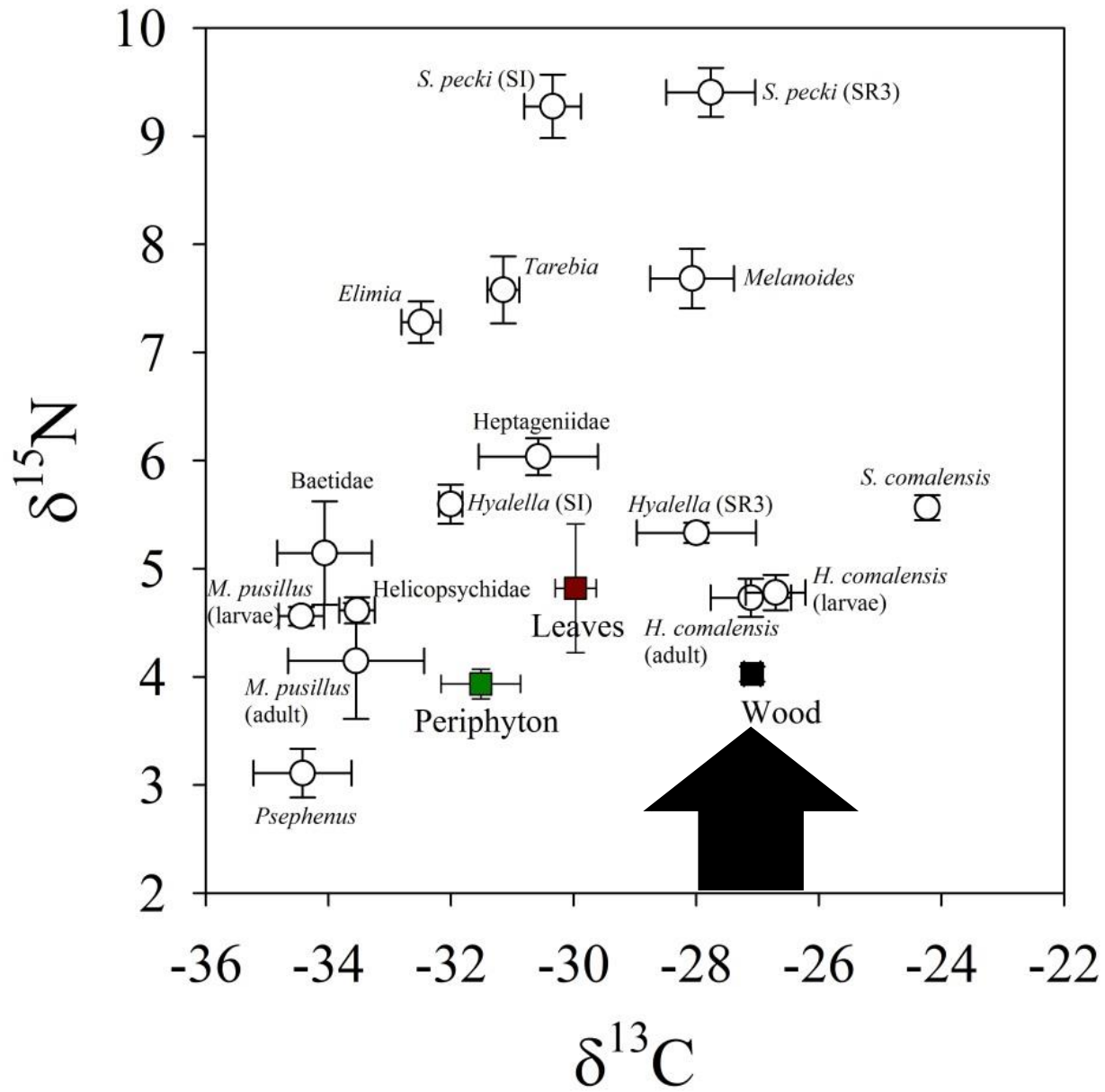


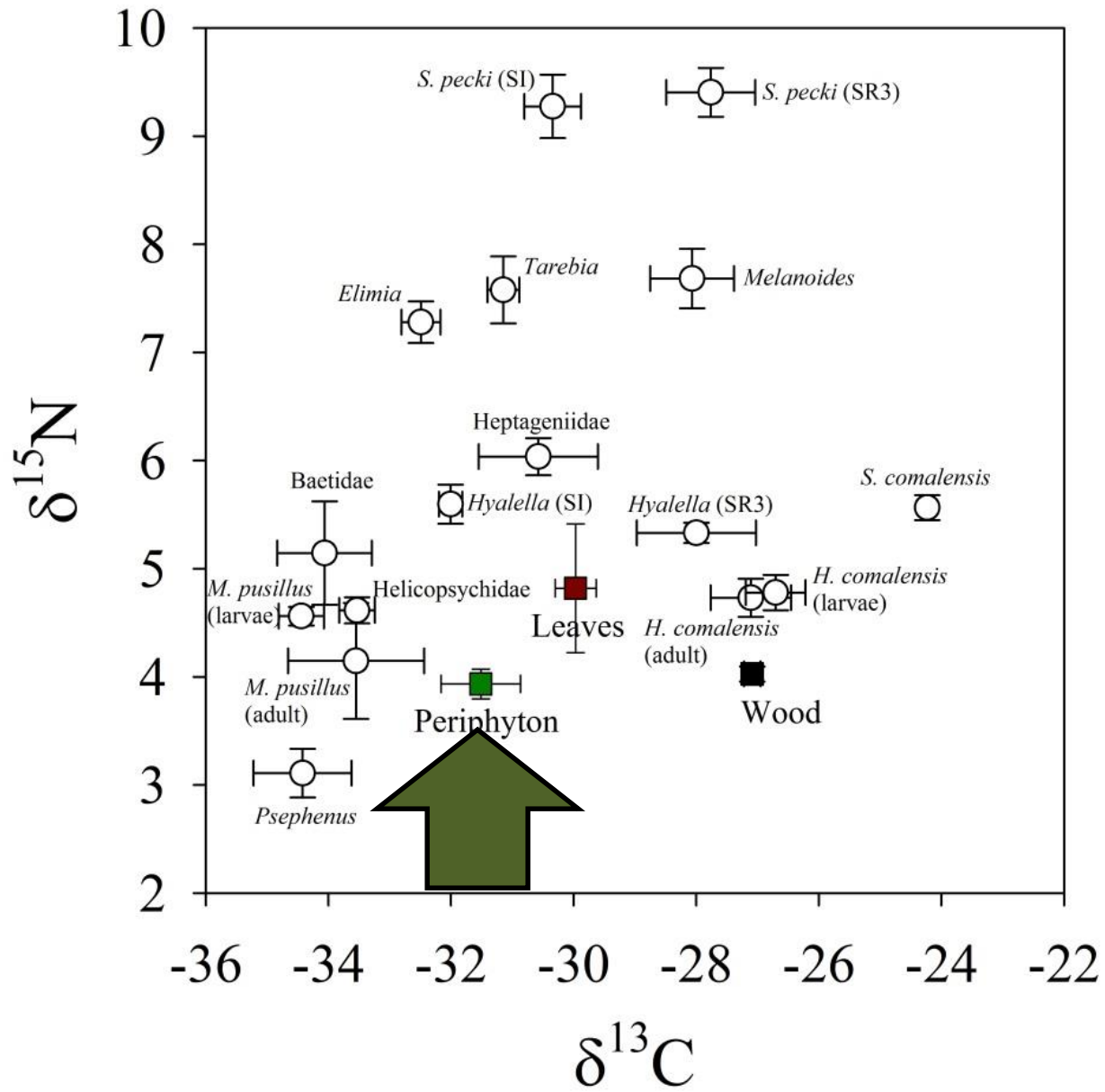


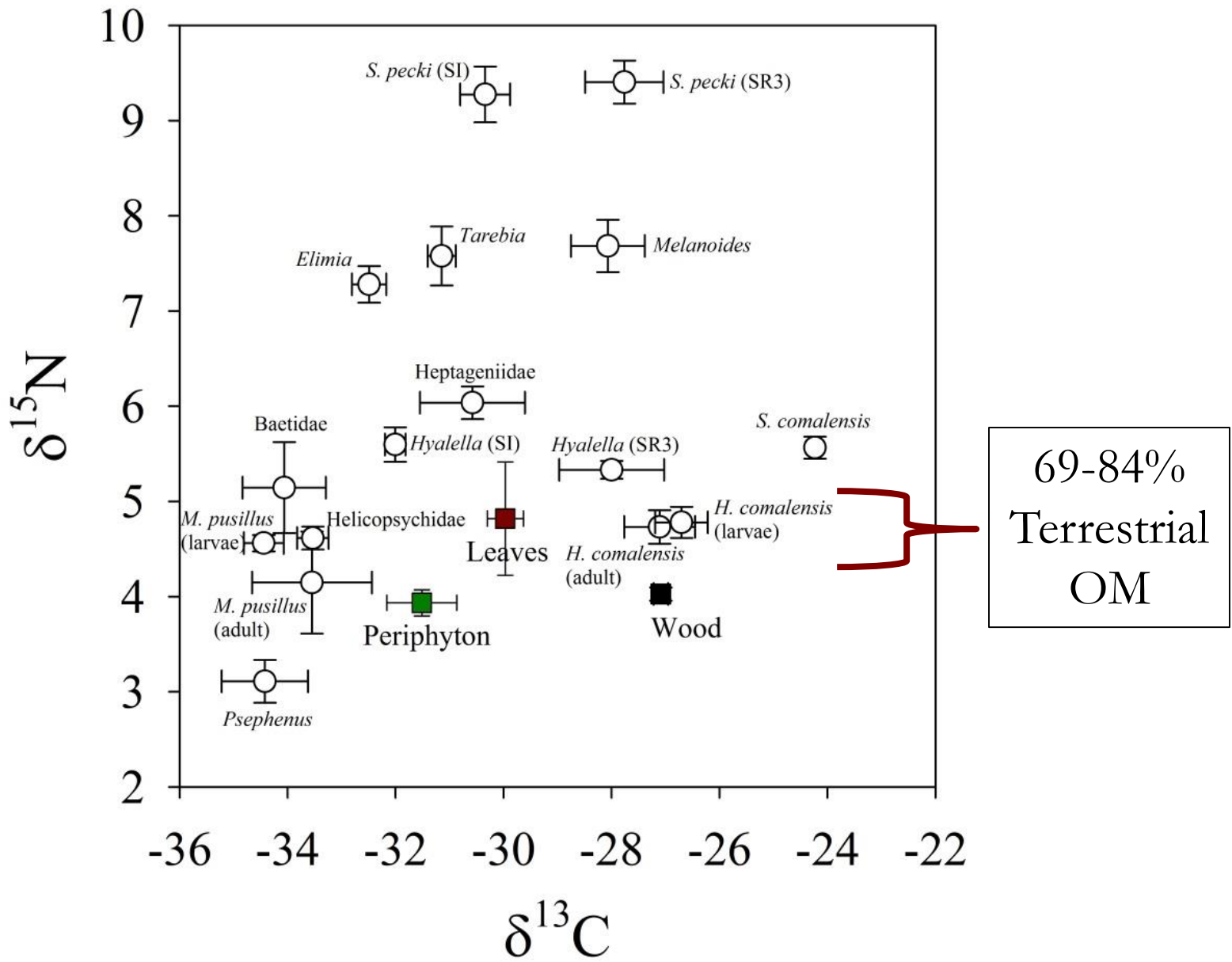












# Study Questions

- Build upon preliminary data on diet and trophic status of CSRB
- What are the biofilms associated with the potential food items associated with CSRB?
  - Wood and leaves *vs* periphyton
- What are the biofilms associated with the cotton-poly lures?
  - Attractant... how different from “natural” food sources?
- Use of bulk isotopes and SI “fingerprinting”
- Microbial identification (FISH and NextGen)

- Why couple isotope data with microbial data?
  - Both forms of data on their own can present issues
  - Isotopes need good “separation” of the source signatures
  - Gut contents require a lot of effort and do not necessarily provide information on assimilation of material
- Cumulatively, these data paint a more complete and potentially complimentary picture





# Stable Isotope Data

- Collect individuals through hand-picking of CSRB adults and larvae
  - Other major invertebrate consumers in the Comal system
  - SR 1, SR 2, SR 3 and Spring Island
  - $n = 5-10$  individuals per species per location
- Sources (woody debris, leaves, periphyton)
- Poly-cotton lures
- Measure “bulk” C and N isotopes
- Also get more specific through performing AA fingerprinting (e.g., leucine)

# Isotope Data Analysis



- Samples analyzed at UC Davis Isotope facility
- Bulk isotopes will be used to determine source contributions to consumers (including CSRB) using SIAR
- Isotopic AA data will be used to determine source contributions using FRUITS

# Microbial Biofilm Analysis



- We will collect information on composition and relative abundance of microbial biofilms
  - Rocks, woody debris, leaves, poly-cotton lures, and guts in hand-picked riffle beetles
  - Spring Run 3 and Spring Island
- Use fluorescent in situ hybridization (FISH)
  - Taxon-specific fluorescent probes to enumerate bacteria
- Sequence biofilms using Next-Gen
  - Sequence data entered into GenBank

