

Database metadata

The following text is the metadata for the database used to test predictions from the model. Each entry in the database includes:

- Reference¹
- Predator taxonomic name²
- Predator common name²
- Predator average mass (in kg)³
- Prey taxonomic name²
- Prey common name²
- Prey average mass (in kg)³
- Medium (either air or water)⁴
- Position (either column or bottom)⁵
- Statement on whether or not the described interaction fits the main assumptions of the model (i.e., either “Yes” or “No”)⁶
- Which assumption is violated (or which violated assumption has the strongest effect)⁷
- The food web the entry belongs to⁸

Notes

¹ References link to studies where each entry was found (Barclay & Brigham, 1994; Barnes et al., 2008; Brose et al., 2005; Bull & Beckwith, 1993; Collins, Anderson, & Johnson, 2010; Fuller, 1989; Gonsalves et al., 2013; Greenaway & Hutson, 1990; Hatton

et al., 2015; Kaspari & Joern, 1993; Orlowski & Karg, 2013; Pithartova, 2007; Quinney & Ankney, 1985; Rakotoarivelo et al., 2007; Ross, 1964; Sierro, Arlettaz, Naef-Daenzer, Strebel, & Zbinden, 2001; Todd, Poulin, & Brigham, 1998). Some of these studies are meta-analysis; therefore the database does not necessarily refers to the original study where the data point was measured.

² Some studies provide only taxonomic or common species name. Missing information writes “NA”.

³ When another metric than body mass was provided (e.g., body volume or body length), it was converted into mass assuming an equivalent spherical shape.

⁴ Medium refers to the medium where the interaction occurs, not the medium where either the predator or the prey may live. The full interaction has to occur within the same medium. Hence, species using interfaces between two media during their foraging activities where not considered.

⁵ "Column" means that the predator spends the whole foraging activity swimming (for aquatic organisms) or flying (for aerial organisms) without taking a rest on a hard surface.

"Bottom" means that the predator spends most of its foraging time on a hard surface (either the bottom of an aquatic system, or the ground).

⁶ The main assumptions of the model are that 1) the interaction occurs on a one-to-one base, 2) the predator tries to actively seize the prey, and the prey actively tries to escape the predator, and 3) both predator and prey can detect each other without interference (i.e., the predator cannot hide itself). If an interaction fits these assumptions, then the

present column shows a "Yes" statement, and the following column (violated assumptions) remains empty ("NA").

⁷ If one (or several) assumption(s) was (were) violated, this column mentions the violated assumption (or the most important violated assumption).

"Hovering" means that the predator violates the hovering assumption, either because it lives on the bottom, or because it takes a rest during the most part of the feeding process.

"Capture" means that the predator violates the capture assumption, thus overcoming the capture mechanical limit: it may feed on prey that move slowly compared to their size, or it may hunt in group (i.e., not a one-to-one interaction).

"Microphagy" means that the predator consumes several prey at a time, thus overcoming the handling energetic limit: it violates the one-to-one relationship assumption.

"Ambush" means that the predator is an ambush (or sit-and-wait) predator. The case is not considered by the model since it involves a totally different mechanism, but it is discussed in the supplementary material.

⁸ If the corresponding entry was used to test the accuracy of the model, the column indicates the food web it belongs to. Otherwise, the column remains empty ("NA").

References

Barclay, R. M. R., & Brigham, R. M. (1994). Constraints on optimal foraging: a field test of prey discrimination by echolocating insectivorous bats. *Animal Behaviour*, 48(5), 1013–1021. doi:10.1006/anbe.1994.1334

- Barnes, C., Bethea, D. M., Brodeur, R. D., Spitz, J., Ridoux, V., Pusineri, C., ...
Jennings, S. (2008). Predator And Prey Body Sizes In Marine Food Webs. *Ecology*,
89(3), 881–881. doi:10.1890/07-1551.1
- Brose, U., Cushing, L., Berlow, E. L., Jonsson, T., Banasek-Richter, C., Bersier, L.-F., ...
Martinez, N. D. (2005). Body Sizes Of Consumers And Their Resources. *Ecology*,
86(9), 2545–2545. doi:10.1890/05-0379
- Bull, E. L., & Beckwith, R. C. (1993). Diet and Foraging Behavior of Vaux's Swifts in
Northeastern Oregon. *The Condor*, 95(4), 1016–1023. doi:10.2307/1369437
- Collins, C. T., Anderson, M. D., & Johnson, D. N. (2010). Food of the Little Swift *Apus*
affinis and African Black Swift *Apus barbatus* in South Africa. *Ostrich*, 81(1), 45–
50.
- Fuller, T. K. (1989). Population Dynamics of Wolves in North-Central Minnesota.
Wildlife Monographs, (105), 3–41.
- Gonsalves, L., Law, B., Webb, C., Monamy, V., Brigham, R., Grindal, S., ... O'Farrell,
M. (2013). Foraging Ranges of Insectivorous Bats Shift Relative to Changes in
Mosquito Abundance. *PLoS ONE*, 8(5), e64081. doi:10.1371/journal.pone.0064081
- Greenaway, F., & Hutson, A. M. (1990). *A field guide to British bats*. Bruce Coleman,
Somerset, United Kingdom.
- Hatton, I. A., McCann, K. S., Fryxell, J. M., Davies, T. J., Smerlak, M., Sinclair, A. R. E.,
& Loreau, M. (2015). The predator-prey power law: Biomass scaling across
terrestrial and aquatic biomes. *Science*, 349(6252), aac6284-aac6284.
doi:10.1126/science.aac6284
- Kaspari, M., & Joern, A. (1993). Prey Choice by Three Insectivorous Grassland Birds:
Reevaluating Opportunism. *Oikos*, 68(3), 414–430. doi:10.2307/3544909
- Orłowski, G., & Karg, J. (2013). Diet breadth and overlap in three sympatric aerial
insectivorous birds at the same location. *Bird Study*, 60(4), 475–483.
doi:10.1080/00063657.2013.839622
- Pithartova, T. (2007). Feeding ecology of four bat species (*Myotis daubentonii*, *Myotis*
mystacinus, *Pipistrellus nathusii*, and *Pipistrellus pygmaeus*): diet structure and
seasonal dynamics in syntopic populations. *Vespertilio*, 11, 119–165.
- Quinney, T. E., & Ankney, C. D. (1985). Prey Size Selection by Tree Swallows. *The Auk*,
102(2), 245–250. doi:10.2307/4086766
- Rakotoarivelo, A. A., Ranaivoson, N., Ramilijaona, O. R., Kofoky, A. F., Racey, P. A., &
Jenkins, R. K. B. (2007). Seasonal Food Habits of Five Sympatric Forest
Microchiropterans in Western Madagascar. *Journal of Mammalogy*, 88(4), 959–966.

Ross, A. (1964). *Ecological Aspects Of The Food Habits Of Some Insectivorous Bats*.
The University of Arizona.

Sierro, A., Arlettaz, R., Naef-Daenzer, B., Strebel, S., & Zbinden, N. (2001). Habitat use and foraging ecology of the nightjar (*Caprimulgus europaeus*) in the Swiss Alps: towards a conservation scheme. *Biological Conservation*, 98(3), 325–331.
doi:[http://dx.doi.org/10.1016/S0006-3207\(00\)00175-0](http://dx.doi.org/10.1016/S0006-3207(00)00175-0)

Todd, L. D., Poulin, R. G., & Brigham, R. M. (1998). Diet of common nighthawks (*Chordeiles minor*: Caprimulgidae) relative to prey abundance. *The American Midland Naturalist*, 139(1), 20–28.