Spider Web Site Selection: Thermal Balance section

This group developed a model for the energy balance on a spider. Perhaps we could use the same framework for developing a model for the triboleum beetle (or are we going more in depth?). The question was how many factors affect spider web site selection, including thermoregulation and temperature. There is an apparent behavioral aspect to thermoregulation. Spiders will spend a certain amount of time out in the sun, even in hot days, if it means a big meal. However, if it gets too hot they really don’t like coming out of their funnels. Their optimal range is about 30°C. In fact, they actually exhibit the shuttling behavior we have talked about and the paper includes some references to frustratingly elusive papers by Porter, Gates, and Birkebak

Cicada Thermoregulation

This is another example of an invertebrate that shuttles in response to thermal stress. Fig 5 is a great example of something we should be able to produce for our beetles. These guys look at activity in terms of singing and moving it seems. We could come up with another way of looking at activity, perhaps through use of the time lapse photography setup we talked about. Something I’ve noticed is that people use different types of heating to test this stuff.

Micrometeorology and Energy Exchange in Desert Arthropods

So, beetles heat up in the sun really effectively. Might this be a different situation than heating from the air? I think it might be.

They monitored the microclimate in arthropod habitats for a while. Thermocouples were attached to scorpions and they were allowed to burrow. Fig 5 is a great graph, again. We should try to get something like that for beetles. How can be measure beetle body temperature?!

Check citations for new sources. They’re highlighted.