9/10/20 Advanced Ecology-Population 1

Savage et al. (2004)

1. When resources are unlimited, r_{max} population growth depends only on metabolic rate and the energy cost to replace+create individuals. Agree?
2. Low body temp has smaller r but higher K (carrying capacity) given the same amount of resource. Is this intuitive?
3. r_{max} represents the maximum exponential growth rate when resources are not limiting. How then can the author justify using field study of fish to estimate r_{max}?
4. First I thought that the r_{max} would be defined at the optimal temperature of the species. But the author chose to separate out temperature from r_{max}, so species can have a range of r_{max} depending on the temperature. At the thermal limits of the species it can have negative r_{max}. Is this definition of r_{max} more conienvent?
5. While average body mass is a trait determined largely by the genetic makeup (in a stable age distribution), body temperature is less apparent, because body temperature is the result of the interaction between the environmental temperature and traits (insulation layer, ecto/endotherm, behavior). In addition, body temperature is affected by body mass and metabolic rate. While they did correct their data with mass/temp, Is treating body temperature as an independent variable appropriate?
6. Authors suggest that once data for r_{max} have been corrected for mass and temperature, vastly different species (unicellular to vertebrates) can be generalized by a similar relationship between r_{max} and temp/mass. Are you convinced?
7. The impression I got from the paper is: "we found this general trend using equations, but we have little interest about how or why it works". Could they've made it more relevant with evolutionary and ecological context?

Barretto et al. (2018)

1. In figure 2D, the population numbers of both species are pretty similar in non-forested habitat across months. While they found a positive relationship between humidity and D. mexicanum population, they failed to find any for D. satanas. Could it be due to the smaller sample size of D. satanas?
2. In figure 2E, humidity at the two ends of the x-axis is not matching up. How may that have affected their model?

(Non related question: the number of days in a month ranges from 28-31. How do you normalize the difference in days when presenting and analyzing such data?)