No Effect of Human Presence at Night on Disease, Body Mass, or Metabolism in Rural and Urban House Finches (Haemorhous mexicanus)[1]

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(1) Background

- Cities expose wild animals to an array of unique stimuli
- Humans presence at night might directly inhibit sleep of wild animals
- Sleep is a mediator of a large number of important behavioral and physiological processes[2]
- Animals commonly exposed to humans, like those inhabiting cities, might adapt resilience to human presence at night

(2) Capture finches from urban and rural sites

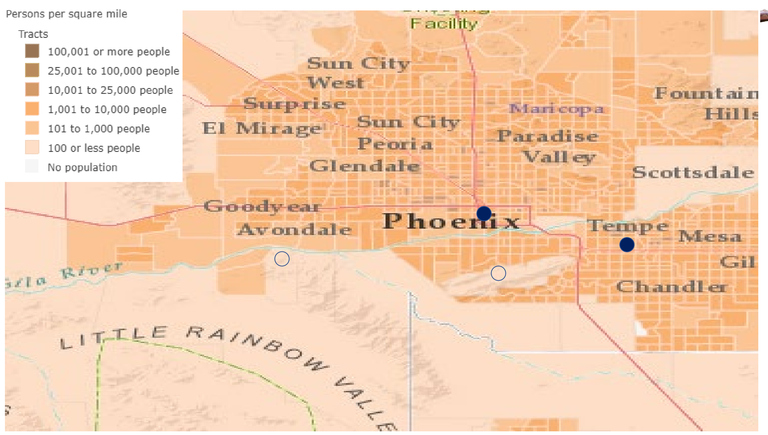


Figure 1. Geographical distribution of study sites in Phoenix, AZ overlaid with human population density data. Human density data are from ArcGIS US Census data (2012). Relative urbanization data is based on previous studies of satellite images[3]. The sites in order from most to least urbanized are: Downtown Phoenix, Arizona State University - Tempe Campus, South Mountain Regional Park, and Estrella Mountain Regional Park. Dark circles represent sites with high degrees of urbanization, and unfilled circles represent sites with low degrees of urbanization.

(3) Human presence at night sharply reduces finch sleep behavior

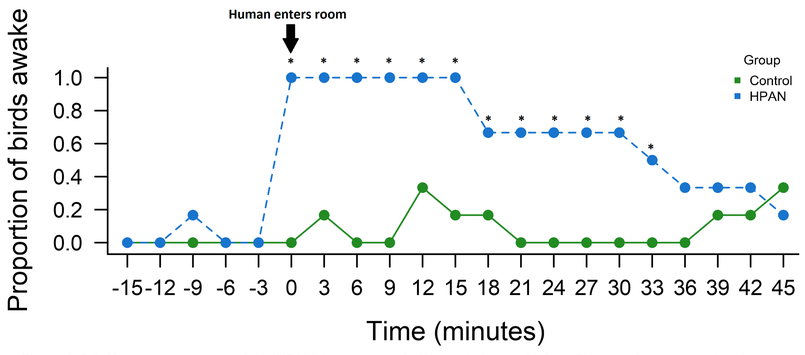
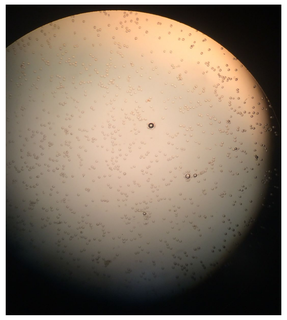
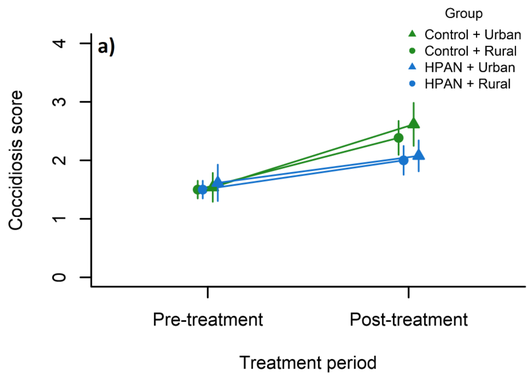


Figure 2. Brief human presence at night (HPAN) increases wakefulness in house finches. Prior to a human entering the room, we found no significant differences in the sleep/wake state between HPAN (n = 6) and control (n = 6) groups. However, following a human entering the room (time = 0), and briefly jostling the cage of each individual, likelihood of wakefulness was significantly different between groups. Symbols above points represent timepoints where we found significant differences in sleep state between groups.

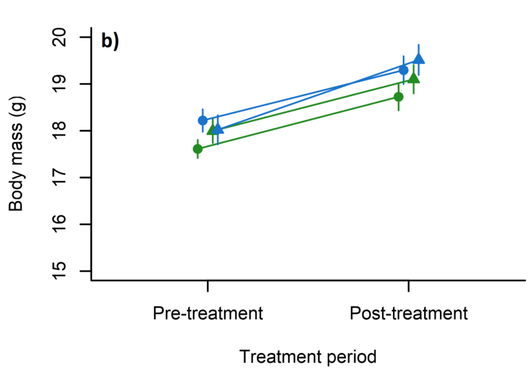
(4) Human presence at night has no significant effects on disease, body mass, or metabolic rate

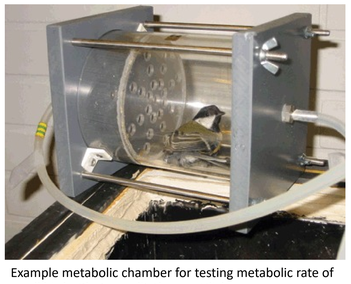


A sample fecal slide from a house finch severely infected with coccidia. Each circle is an *Isosporan* oocyst generated by mature parasites inhabiting the intestinal wall.



Example scale for measuring the mass of small birds.





Example metabolic chamber for testing metabolic rate of small birds. Photo credit Thomas Ulich.

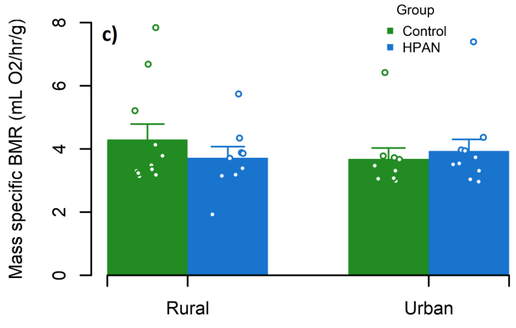


Figure 3. Neither a) coccidiosis score, b) body mass, nor c) mass-specific BMR were affected by the HPAN treatment, habitat urbanization, or their interaction. Error bars represent means ± SEM.

(5) References

1. Hutton P, Wright CD, DeNardo DF & KJ McGraw. 2018. *No Effect of Human Presence at Night on Disease, Body Mass, or Metabolism in Rural and Urban House Finches (Haemorhous mexicanus)*. Integrative and Comparative Biology 58(5): 977-985. **2**. NC Rattenborg et al. 2007. *The non-trivial functions of sleep*. Sleep Medicine Reviews 11(5). **3**. M Giraudeau et al. 2014. *Parasites in the city: degree of urbanization predicts poxvirus and coccidian infections in house finches (Haemorhous mexicanus)*. PLoS ONE 9(2): e86747

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