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The Effect of Capture Method on Microbial Abundance in Plumage of Eastern Yellow Robins (Eopsaltria australis)

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The effect of capture method on microbial abundance in plumage of Eastern Yellow Robins (*Eopsaltria australis*)

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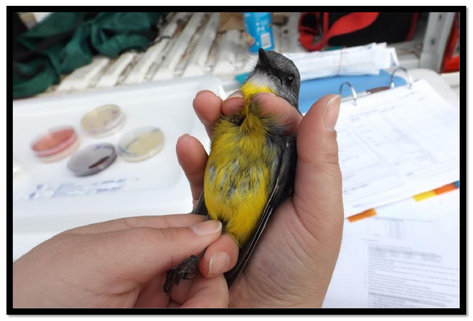
Abstract

Bird plumage is an ecosystem of microfauna that live in symbiosis with the avian host. Since most of these microbes are soil-dwelling bacilli, it is assumed that birds with more soil contact will have higher microbial loads. While pursuing avian microbiology research in Victoria, Australia, we questioned if capture method influenced microbial loads and therefore skewed our data. We expected microbial abundance on birds captured with mist nets, a device used to catch birds in flight, will have lower abundance than those captured with snap traps, a tool which restrains the bird in the soil. We compared the abundance of *Bacillus* spp. on Eastern Yellow Robins (*Eopsaltria australis*) captured in both trap types. After statistical analyses, the data was found to significant overall (p = 0.004), but when comparing data from specific parts of the bird, capture method was only a significant factor on the back (p = 0.039; p = 0.055 and 0.125 on tail and venter, respectively). We assume that our methodologies have created a detection limit in our data, leaving our results inclusive to whether or not method of capture is a factor in microbial abundance.



Introduction:

- Microbes found in bird plumage are often soil dwelling *Bacillus* spp.
- We questioned whether trapping methods affected our microbial data.
- We predicted birds captured with snap traps would have higher microbial loads than those captured with mist nets.

Methods

- Captured 56 Eastern Yellow Robins (*Eopsaltria australis*) in mist nets and snap traps.
- Sampled plumage microbes on the back, tail, and venter.
- Inoculated microbes on tryptic soy agar (TSA) at 37°C for 48 hours.
- Counted and identified colonies with special attention to *Bacillus* spp.

Figure 1: Extracting *E. australis* from mist net.

Figure 2: *E. australis* restrained in snap traps (top) and a baited trap (bottom).

Photo credits: Dr. Alexander Wilson, Deakin University

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Results

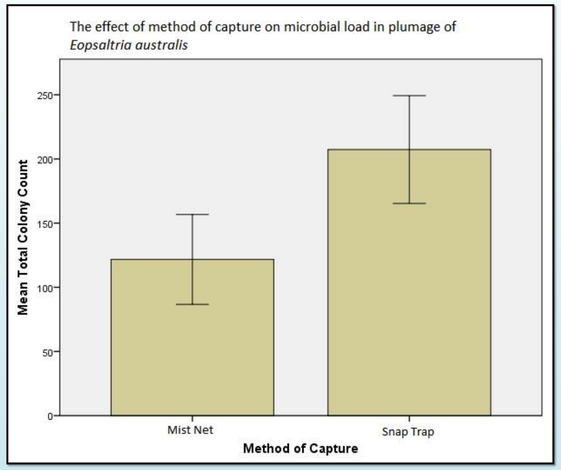

Figure 3: Overall comparison of microbial load by method of capture. There is a significant difference where p = 0.004.

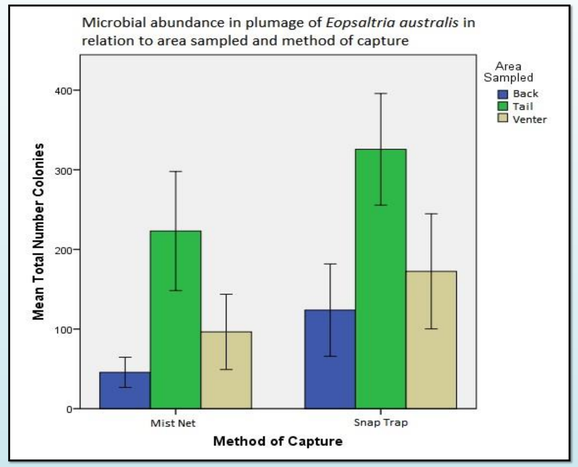

Figure 4: Comparison by area on bird; back is significant with a p-value of 0.039. Tail and venter. were not significant with values of 0.055 and 0.125, respectively.

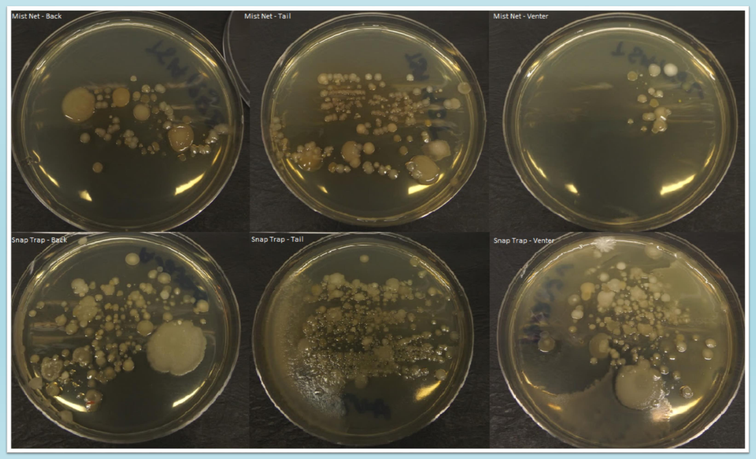

Figure 5: Qualitative comparison of microbial abundance from different sampling areas and each trapping method.

Discussion

- Results are inconclusive as to whether or not method of capture actually plays a role in microbial load.
- Where the back yielded a significant difference between trap type, tail and venter did not.
- The inconsistencies may be caused by a detection limit in our data since we have a maximum value of 350 colonies per plate. Therefore, we cannot be certain about significance with this quantitative restriction.