



FROM THE VISIBLE TO THE INVISIBLE: PATTERNS OF PARASITISM IN ILLINOIS BIRDS

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ABSTRACT

Populations of many bird species have been declining throughout North America, although the causes of decline are often unclear. Rapidly changing environments present novel stressors that may be driving these declines by negatively impacting the health of birds. Therefore, we assessed how avian health is affected by environmental stressors along an urban to natural gradient. One potential indicator of bird health is infection with parasites and pathogens. In order to understand how environmental factors impact infection levels, we have to establish a baseline for measures of parasite diversity and abundance. For this project, we conducted a literature survey of articles from the past century documenting parasites and pathogens in seven common shrubland birds: the American Robin, Brown-headed Cowbird, Eastern Towhee, Field Sparrow, Gray Catbird, Brown Thrasher, and Northern Cardinal. We provide parasite species lists for each host, examine shared infections among hosts, and provide a map of the geographic range of observations. Parasites of many hosts are understudied, and we explore how detection bias may limit our understanding of parasite diversity and abundance.

Helminth taxa parasitizing Illinois birds



METHODS

Used Web of Science to conduct a literature review of host species.

Used the following keywords:

- Helminth/Helminths
- Parasite/Parasites/Parasitism

Compiled a list of all intestinal parasites of focal hosts including:

- Parasite species name
- Host sample size
- Parasite prevalence (percent infected)
- Parasite intensity (average # of parasites per infected host)
- Geographic location of study

RESULTS

We found 37 published manuscripts reporting helminth parasitism of our six focal hosts. Refer to Figure 1, below, for further details on the number of studies found for each bird species and the corresponding number of helminth parasites reported in those studies.

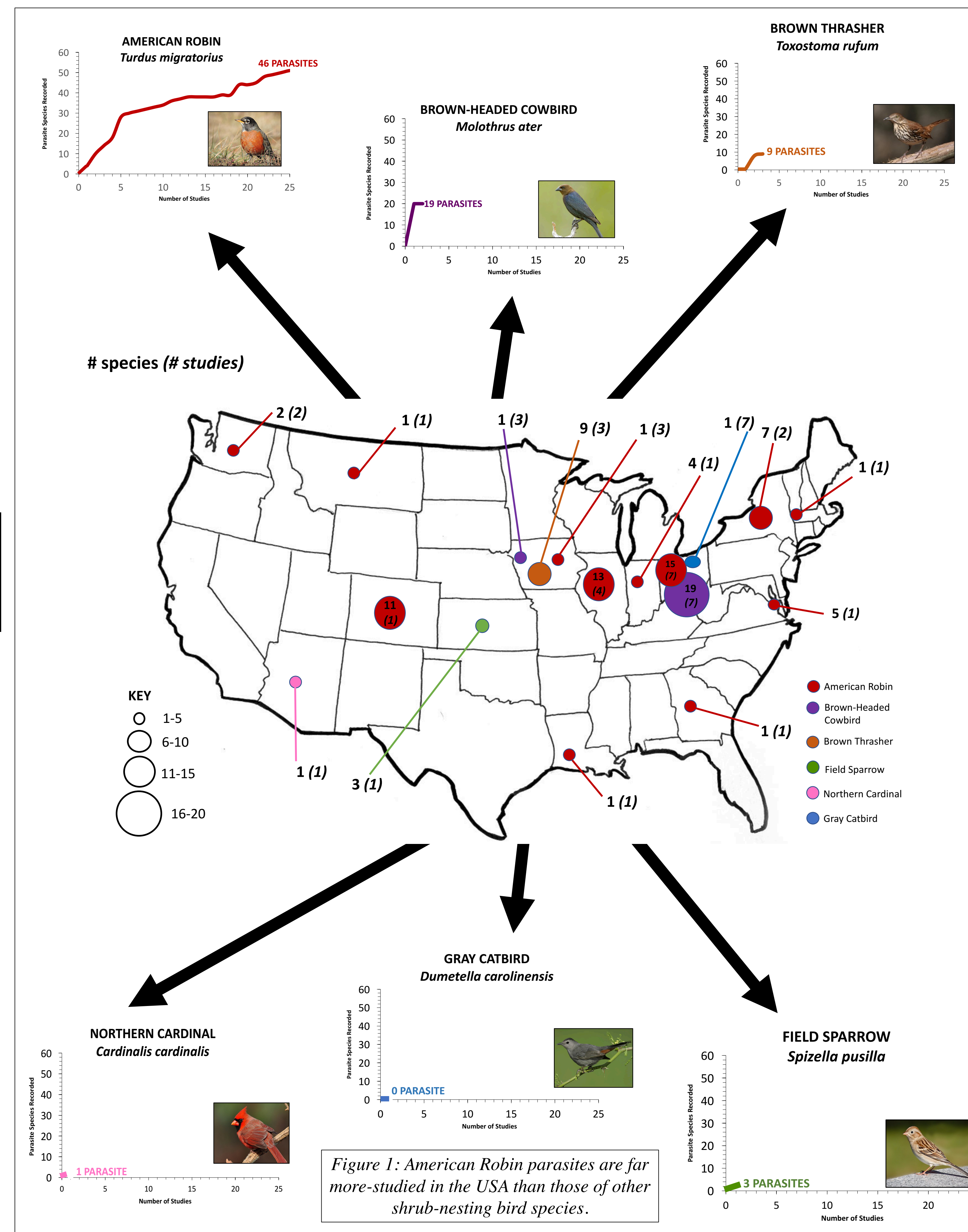


Figure 1: American Robin parasites are far more-studied in the USA than those of other shrub-nesting bird species.

CONCLUSIONS

- These six birds host considerable diversity; 75 intestinal parasites were recorded (Table I).
- Parasites of American Robins have been particularly well-studied relative to the other focal species. Approximately 64.8% of studies document American Robin parasites compared, to only 35.2% of studies documenting parasites of our five other bird hosts.
- Parasite diversity in robins increases with **effort** (Figure 1) and with increased geographic range of study (Figure 2).
- There is little parasite sharing among our hosts, suggesting high host-specificity. While the Brown-headed Cowbird shares seven parasites with the American Robin, no Robin parasites have been recorded among the other four species. Low detection limits our ability to examine parasite overlap among hosts.

Host Species – Parasite group – Parasite species

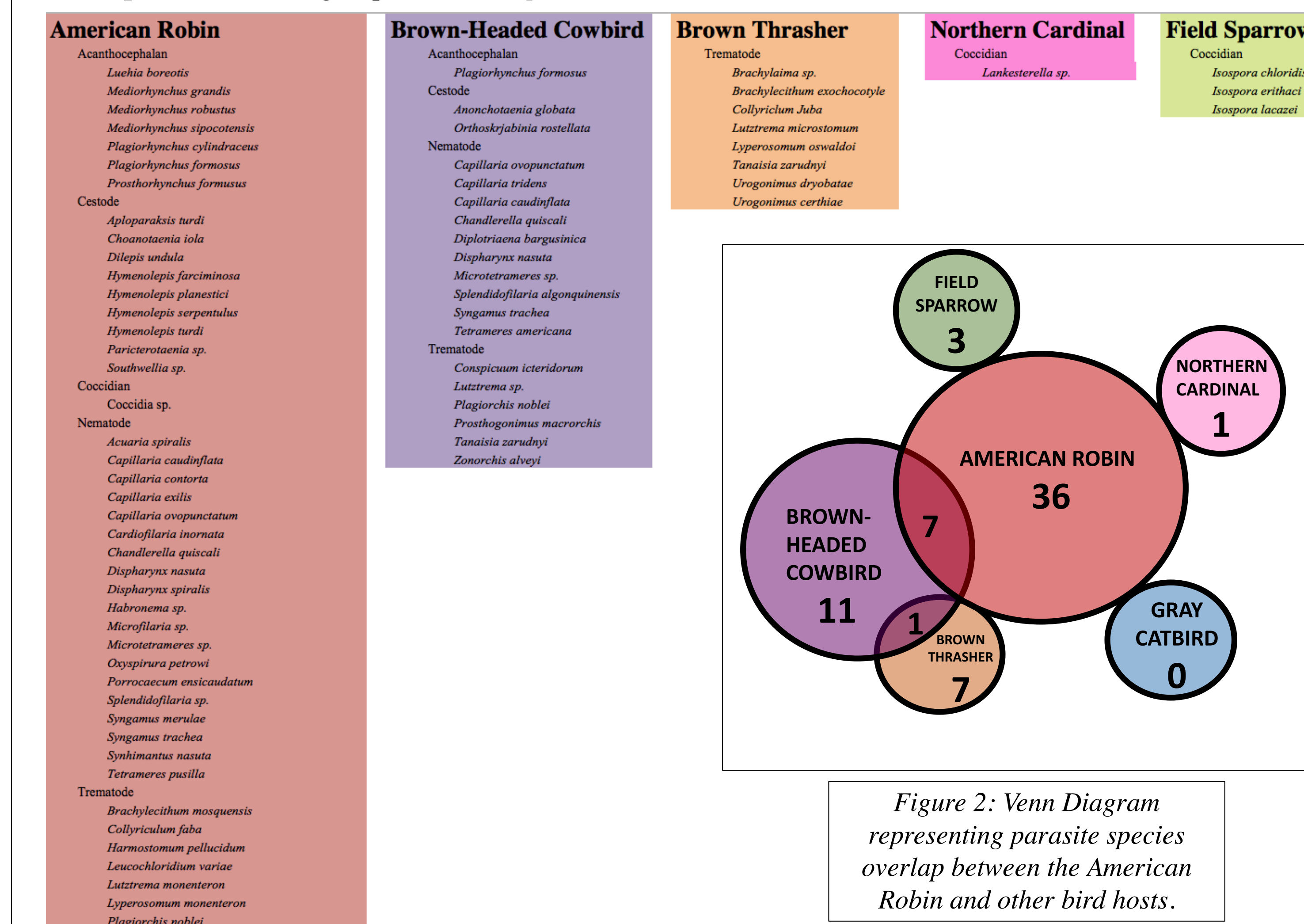


Figure 2: Venn Diagram representing parasite species overlap between the American Robin and other bird hosts.

Table 1: Species list of intestinal parasites recorded from six shrub-nesting bird species.

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LITERATURE CITED

Hamer, G.L., Muzzall, P.M. 2013. Helminths of American Robins, *Turdus migratorius*, and House Sparrows, *Passer domesticus* (Order: Passeriformes), from Suburban Chicago, Illinois, USA. *Comparative Parasitology* 80.2: 287-91; Cooper, C. L., Crites, J. L. 1974. Helminth Parasites Of The Robin From South Bass Island, Ohio. *Journal of Wildlife Diseases* 10.4: 397-98.

A full list of the 37 citations used for this work can be made available upon request. Please contact presenting author.