Status assessment survey for springtails (Collembola) in Illinois caves: the Salem Plateau

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Introduction

In Illinois, cave-inhabiting springtails have been recorded from four of the state’s five karst regions. A detailed assessment of the literature shows that 60% of the species are known from single caves and more than 85% are restricted to caves in a single karst region. This suggests that knowledge of the springtail fauna of Illinois caves was limited, with opportunities for new discoveries.

Results

In total, 49 species of springtails were found. 7 are new to science. 8 others represent new records for Illinois and 19 are new cave records for the species. The more than doubles the number of springtail species known from caves in the Salem Plateau region.

More than half (23) of the species reported are ranked as rare at the state level (i.e., S1-S2). For a few of these species, this ranking is probably an artifact of the relatively poor knowledge of the state’s fauna. Some species which are rare in the state constitute populations at the limit of the distributional range of the species, and others, e.g., Xyphosaphidion sp., are probably truly rare and endemic to the region.

Methods

Field sampling

In 2009, eight caves in Monroe and St. Clair counties, Illinois, were sampled for springtails.

Comparison to Previous Studies

Previous reports of cave Collembola from the Salem Plateau list 18 species (Pack and Lewis 1978, Lewis et al. 2003). We did not find eleven of the species previously reported, but nine of these were from caves we did not visit. Of the eight caves we surveyed, seven were previously sampled by Pack and Lewis (1978) and Lewis et al. (2003). In all instances, caves sampled in the present study yielded more species than previously reported. In most cases, the species reported by Lewis et al. (2003) were collected again.

Conclusions

Pitfall traps, Berlese funnel extractions, and drop pools and hand collections in other cave habitats are the four most effective ways to sample for cave springtails. The total number of springtail species in the Salem Plateau caves could be more than twice what we have recorded in the present study. The data suggest that more new species and state records will be found once caves in other Illinois karst regions are more thoroughly examined.