Tall grass, small wasps: measuring the biodiversity of parasitic braconid wasps (Hymenoptera: Ichneumonoidea) in two warm season grasslands

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Introduction:
• Grasslands are the most endangered ecosystem in North America1; measuring biodiversity in grasslands is therefore critical for conservation
• Calculating parasitic wasp diversity in grasslands provides an indication of potential ecosystem services and overall insect diversity2
• Braconidae (Fig. 1A), a family of parasitic wasps, is of interest given its high species richness and breadth of biological diversity
• Here, diversity was estimated for braconids in two characteristically different warm season grasslands (Fig. 2-3) in the Shenandoah Valley of Virginia

Materials and Methods:
• Oxbow Pond (Fig. 2): 8 ha, burned
• Jones Nature Preserve (Fig. 3): 32 ha, burned and mowed
• 3 SLAM traps (Fig. 1B) at each site March 31-June 30, 2014
• Specimens sorted into morphospecies
• Statistical analysis using SAS 9.2
• Diversity index using EstimateS 9.1.0

Results:
• 575 specimens collected; sorted into 48 genera and 104 morphospecies
• Species richness was 68 at Jones and 63 at Oxbow; mean richness (Fig. 4) did not differ significantly (P=0.3363)
• Species diversity differed greatly between the sites as indicated by a Morisita-Horn3 value of 0.294 (max=1)
• 75 species (72%) represented by singletons

Discussion:
• Both sites are surrounded primarily by hay fields (cool season grasses) and eastern deciduous forest
• Jones yielded far more specimens; this could be due to factors such as:
  • Fragment size
  • Management plan
  • Differences in species composition could be due to factors such as:
  • Differential colonization
  • Presence of host species
• Lack of species saturation indicates further sampling must be conducted

References:

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Figure 1. A braconid wasp species found at Jones Preserve (A), and a SLAM trap used for collection (B).

Figure 2. Species richness at each subsite within Oxbow Pond (A) and accumulation of species as a function of specimens collected (B). Singletons represented 67% of the total species.

Figure 3. Species richness at each subsite within Jones Preserve (A) and accumulation of species as a function of specimens collected (B). Singletons represented 49% of the total species.

Figure 4. Total number of braconid species encountered at each site. The mean number of braconid wasp species sampled across both sites did not differ significantly (F=1.19, df =1, P=0.3368). The majority of specimens were made up of only 8 species (59%).