

# MICROHABITAT EFFECTS OF LITTER TEMPERATURE AND MOISTURE ON FOREST-FLOOR INVERTEBRATE COMMUNITIES

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Litter temperature and moisture may be altered due to changes in global climate. We investigated the effect of small changes in litter temperature and moisture on forest-floor communities in West Virginia. We altered litter temperature and moisture in 6 x 6 m plots covered with landscape cloth. The study sites were in six watersheds (three north-facing and three south-facing aspects) in the Fernow Experimental Forest and in the West Virginia University Forest from April 1992 - April 1993. We measured microbial biomass (ATP), invertebrate density, and invertebrate composition. In covered blocks, litter temperature increased by 0.01 °C, -2.1 °C and litter moisture increased by 0.01 - 4.2 percent.

We identified 134 litter invertebrate species in nine orders. Overall invertebrate density was not associated with changes in temperature and moisture; however, both richness and evenness were associated with changes in temperature and moisture. Density and richness of springtails (*Collembola*) were higher in covered blocks, which had higher temperature and moisture values as compared with reference blocks. Densities of 20 invertebrate species were correlated with changes in mean daily temperature, mean moisture, or changes in the range of temperature and moisture. Maximum and minimum values for both temperature and moisture increased in covered blocks, and there were more significant associations of invertebrate density and richness with changes in range (maximum and minimum values) than with changes in the average temperature or moisture values. Litter ATP decreased in covered study blocks.

Temporal (month and season) and spatial (forest, watershed, aspect, and location on slope) variables had an effect on invertebrate density, richness, and evenness, as well as on litter temperature and litter moisture. Results from this study indicate that small changes in litter temperature and moisture can effect forest-floor invertebrate communities.

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