

## FEATURE ARTICLES

### **THERMOREGULATION AND HABITAT PREFERENCE IN MOUNTAIN CHICKADEES AND JUNIPER TITMICE**

SHELDON J. COOPER<sup>1</sup> AND JAMES A. GESSAMAN

Department of Biology, Utah State University, Logan, UT 84322-5305

Manuscript received 10 March 2004; accepted 27 July 2004.

<sup>1</sup>Present address: Department of Biology and Microbiology, University of Wisconsin, Oshkosh, WI 54901-8640. E-mail: [cooper@uwosh.edu](mailto:cooper@uwosh.edu)

**Abstract.** The Mountain Chickadee (*Poecile gambeli*) and the Juniper Titmouse (*Baeolophus ridgwayi*) are closely related, ecologically similar passerines sympatric in portions of their range. However, Mountain Chickadees prefer higher altitude, cooler habitats than Juniper Titmice. We measured oxygen consumption, evaporative water loss, body temperature, and thermal conductance on seasonally acclimatized individuals to determine if thermoregulatory differences correlate with habitat preference. The Mountain Chickadee's lower critical temperature was 4.2°C lower than the Juniper Titmouse's in summer and 2.4°C lower in winter. Thermal conductance decreased significantly in winter relative to summer in Mountain Chickadees but not in Juniper Titmice. The Mountain Chickadee's upper critical temperature was 4.2°C lower than the Juniper Titmouse's in summer. Also in summer, Mountain Chickadees had significantly higher body temperature above the upper critical temperature than Juniper Titmice, indicating less heat tolerance. The overall metabolic response to temperature in these two species suggests that physiology plays a role in maintaining their habitat segregation.

**Key words:** *Baeolophus ridgwayi*, energy metabolism, evaporative water loss, habitat preference, oxygen consumption, *Poecile gambeli*, thermoregulation.