

HIGH TEMPERATURE RESISTANCE OF THE TERRESTRIAL RED MITE (*BALAUSTIUM* SP.) AS A PRODUCT OF SUPPRESSED HEAT INDUCED WATER PERMEABILITY

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ABSTRACT - An impressive capacity to thrive at temperatures as high as 50°C is reported for adults of the velvet mite, *Balaustium* sp. near *putmani* (Acari: Erythraeidae) from Ohio, USA. This mite also has the ability to recover from injury due to heat shock, demonstrating a 2/3 survival rate after treatment at 52°C. Exposure to 54°C was lethal and could not be protected against by conditioning at a sublethal temperature. These mites exhibit a 50-52°C threshold where evaporative water loss rate accelerates sharply, an inflection point that we have designated as the lethal permeability temperature (LPT); mortality is attributed to rapid water loss at temperatures above LPT. When data are plotted on an Arrhenius plot as in the case of critical transition temperature (CTT) however, this inflection point (LPT) disappears, thus implying that this mite resists an increase in cuticular lipid fluidity as the temperature rises.

Key words - Acari, Erythraeidae, *Balaustium*, heat stress, critical transition temperature (CTT), lethal permeability temperature (LPT).

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