

Critical temperatures for survival of brood and adult workers of the giant honeybee, *Apis dorsata* (Hymenoptera: Apidae).

ABSTRACT

Capped brood (capped within 36 h) and adult workers of *Apis dorsata* were removed from naturally occurring colonies and kept incubated in laboratory hoarding cages at constant temperatures ranging from 26 to 45 °C to study mortality, survivorship, and water and syrup consumption. Capped brood died at temperatures above 36 °C. Below 30 °C adults tended to emerge deformed. Low temperatures delayed development. The optimal temperature for complete emergence of healthy adult workers was 34 °C. Adult workers survived well from about 26 to 36 °C. At 38 °C they died within 5 days and at 45 °C they died within 48 hours. Although syrup (1 sugar: 1 water W/W) consumption did not change over the range of temperatures used, water consumption rose rapidly above 38 °C to over 3 ml/bee in 48 hours at 45 °C. Nest temperature control is critical for survival of brood of *A. dorsata* and adult worker bees have tight constraints on their abilities to endure high temperatures. Water availability is vital for cooling the colony under hot, tropical conditions, and rearing healthy brood.

Keyword: *Apis dorsata*; Optimal temperature; Thermoregulation; Tropical Asia; Brood; Workers.