Maintaining laboratory cultures of cave-dwelling and surface-dwelling isopod crustaceans

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Abstract

Many aspects of cave animal biology cannot be understood through field observations alone. Access to some subterranean habitats is often technically challenging, rendering long-term monitoring of cave-dwelling species or investigating some aspects of their biology difficult. Also, contemporary research questions and methods require sampling individuals at certain life stages, and most cave adapted species have lengthy life spans or are not accessible in their natural habitats year-round. Therefore, we have established an animal facility in our laboratory where we keep cave-dwelling and related surface-dwelling crustacean species under controlled conditions. This allows us to study physiological and behavioral adaptations and the role of phenotypic plasticity in the evolution of these traits in cave dwellers. We are culturing freshwater, marine, and terrestrial isopods from three different families (Asellidae, Sphaeromatidae, and Trichoniscidae), among others. To date, we have established breeding colonies of several different cave and surface species pairs of aquatic asellids, and our most successful colonies have lived for two years and three generations. We have also established colonies of cave (freshwater) and surface (marine) sphaeromatids with varying degrees of success. Among terrestrial trichoniscids, colonies of cave species have persisted for more than two years, but without successful reproduction. Our repeated attempts to maintain surface species of *Trichoniscus* have been unsuccessful. Here we present our experiences to provide guidance for other researchers making similar attempts. We discuss general care practices such as decontamination of equipment and tools, quarantine, good and bad practices for small aquarium and terrarium design, housing, water treatment and conditioning, various food sources, and breeding approaches. We also review some of the problems we have encountered with our colonies and describe our attempts to solve them with varying degrees of success.

Keywords

experimental animals, animal care, Isopoda, cave-adapted, stygobiont

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