Presenter Gisselle Mejia

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Discipline Chemistry

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Presentation Type Poster

Title Asellus aquaticus: Genetic basis of pigmentation and eye loss in the Romanian subterranean isopod crustacean, Asellus aquaticus infernus

Abstract

Cave animals live in dark environments and can lack eyes and pigmentation. Surprisingly, studying cave animals can be relevant to human diseases. Asellus aquaticus is an isopod crustacean with both surface populations and cave populations that are found in many locations throughout Europe. Previous research generated a linkage map of A. aquaticus and found different regions responsible for distinct eye and pigment phenotypes in a Slovenian cave population. Surprisingly, these same regions were also found to be responsible for similar phenotypes in another cave population, also from Slovenia. However, it is unknown if other cave populations also have the same regions responsible for eye and pigment phenotypes. To address this question, we studied Asellus aquaticus infernus, a cave population from Romania, which lives in sulfidic subterranean environments that are geographically distant from other populations previously studied as well as ecologically different. Similar to the previously studied populations, Asellus aquaticus infernus also lacks pigmentation and eyes. We investigated whether Asellus aquaticus infernus had the same regions responsible for pigment loss and eye loss, as those known from the cave populations from Slovenia. We hypothesized that the same regions were responsible for no pigment, orange pigmentation, red pigmentation, and no eyes in A. aquaticus infernus as the Slovenian cave population. We generated 120 F2 individuals by crossing cave males to surface females. We genotyped them for several genetic markers known to mark for phenotypes in the previously studied Slovenian population including nckx30 (orange pigment), scarlet (pigment loss), fat facets (eye loss), and pax 2 (red pigment). In order to genotype these individuals, we used PCR, gel

electrophoresis, and DNA sequence analysis. We compared genotypes of these genetic markers with eye and pigment phenotypes in the F2 individuals. So far, we were able to conclude that the same region, marked by the gene scarlet, is responsible for presence versus absence of pigment in A. aquaticus infernus and the previously studied Slovenian cave population. Currently, we are also investigating if the same regions are responsible for other phenotypes in A. aquaticus infernus and the Slovenian cave populations including orange pigmentation, red pigmentation, and eye loss.