Caste Plasticity in the H. saltator Ant - Social Context Influences Dominance and Reproduction Related Gene Expression

ANIM075

Animal Sciences

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The effects of social conditions on gene expression in Harpegnathos Saltator were analyzed to provide a better understanding of caste plasticity and reproductive potential in these ants. As eusocial insects, H. Saltator ants are organized in colonies that have a queen ant that produces queen pheromones. This in turn induces expression of corazonin, which in worker ants prevents them from becoming reproductive. However, when the queen ant is not present in a colony, worker ants can become reproductive as corazonin is no longer inhibited. Vitellogenin, a reproductive stimulating hormone, starts to be expressed in some ants. The ants that exhibit reproductive ability also exhibit a behavior known as dueling during the transition phase. This study attempts to understand the correlation of gene expression associated with dominant ants, or ants with the most dueling activity. Colonies of thirty ants, set without a queen, were allowed to duel for one and a half months. Once dominant duelers emerged, they were isolated from the colony and forced to revert back into non-reproductive ants. Extractions of the fat body and brain, at set time points, were taken and analyzed for expression levels of corazonin and vitellogenin. It was determined that corazonin was significantly lower in reproductive ants but increased as they reverted back to non-reproductive states. Vitellogenin levels correlated with reproductive potential with higher levels in ants that were reproductive. This experiment correlates extent of dueling, a social behavior with reproductive potential, inviting the question of gene priming for selective reversion of previous duelers.

1. In this research project, the student directly handled, manipulated, or interacted with (check ALL that apply):

human participants	potentially hazardous biological agents		
vertebrate animals	microorganisms	rDNA	tissue

2. I/we worked or used equipment in a regulated research institution or industrial setting (Form 1C):	✘	YES		NO
3. This project is a continuation of previous research (Form 7):		YES	✘	NO
4. My display board includes non-published photographs/visual depictions of humans (other than myself):		YES	✘	NO
5. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only:	✘	YES		NO
6. I/we hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.	✘	YES		NO

The stamp or embossed seal attests that this project is in compliance with all federal and state laws and regulations and that all appropriate reviews and approvals have been obtained including the final clearance by the Scientific Review Committee.

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