

# BIOL 215 ASSIGNMENT - 1

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## 1 Question 1

What type of variation did the Authors' find in natural populations of the ant *Pheidole morrisi*, which prompted the Author's study (**1 mark**)? What is nature of the polyphenism found in *Pheidole* species (**1 mark**) and how did it help understand the developmental origin of the variation found in natural populations of the same species (**1 mark**)?

TODO

## 2 Question 2

What role do the vestigial wing discs play in understanding the developmental and evolutionary origin of super soldier ants in *Pheidole* (**2 marks**)?

TODO

## 3 Question 3

How did the Authors experimentally induce supersoldier-like ants in species that have not evolved them (**1 mark**)? Why do experimentally induced supersoldierlike ants have little vestigial wings (**0.5 mark**)? What conditions in nature may induce super soldier anomalies (**0.5 mark**) ?

In order to experimentally induce supersoldier-like ants in species such as *P. morrisi*, the author exposed the larva to methoprene. Methoprene is a JH analog that cause the larva to develop into a supersoldier-like subcaste.

At the larva stage, there are two JH-mediated switch point that will determines the subcaste of the subject. The queen has two complete wing discs with two hinges and two

pouches. On the other hand, the minor worker has none of these (they are missing) and the soldier ants has a regular hinge but the pouch was not conserved at the larva stage. It seems that the supersoldier-like individuals differ in their wing pouch expression of sal and the number of wing disc present at the larva stage, causing the subcast to have little vestigial wings.

There are several conditions that might have motivated the induction of the supersoldier-like subcasts. This subcast is induced when the larva is developing through JH and may be influenced by nutrition. This is why the researcher used methoprene during their experience.

## 4 Question 4

Give an example from the class on variation resulting from environmental cues that relates to this paper (**2 marks**)? Are the environmental cues the same or different as what was discussed in class (**1 mark**)?

TODO

## 5 Question 5

What is the definition of independent or parallel evolution (**1 mark**)? How many times did supersoldier ants evolve independently (**0.5 marks**)? What is ancestral developmental potential (**0.5 marks**)? How does ancestral potential change our idea of independent evolution (**2 marks**)?

TODO

## 6 Question 6

Why has the potential to induce supersoldiers in species that do not have them been retained for millions of years (**1 mark**)?

TODO

## 7 Question 7

Do other animals have ancestral developmental potential? If so, please give an example (**1 mark**)?

TODO