BIOL 215 ASSIGNMENT 1

***Rajendhran Rajakumar, Diego San Mauro, Michiel B. Dijkstra, Ming H. Huang, Diana E. Wheeler, Francois Hiou-Tim, Abderrahman Khila, Michael Cournoyea, Ehab Abouheif. 2012. Ancestral Developmental Potential Facilitates Parallel Evolution in Ants. Science 335 (6064): 79-82*.**

Questions TOTAL 15 Marks (*please keep your answers concise and to the point*):

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)**?

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

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

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)**?

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)**?

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

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