

Caste Determination in Desert Harvester Ants Altered by Overwintering Processes

Social insects such as ants, bees and wasps have two castes; queens and workers. Depending on the age of the colony, workers may also vary in size. Past research on harvester ants has supported that queen condition, including her age, exposure to cold, or nutritional factors influence the caste of her offspring. Whether worker size is also influenced by seasonal temperature change on a queen's egg laying processes is yet to be discovered. In this study, I tested whether natural environmental changes in temperature will result in the development of different sized workers by comparing the size of worker pupae in overwintered versus non-overwintered colonies, then cross-fostered eggs to independently vary overwintering status of queens and workers. Experimental colony pupae were measured and compared between those artificial colonies while the parental colony pupae were compared to each other. According to my results, pupae morphology increased from a time when pupae were sampled before environmentally conditioned to afterwards. Pupal size increased significantly over time in both non-overwintered and overwintered source colonies, despite the fact that overwintered colonies had not been growing in numbers during the intervening period. However, pupal size in the experimental crosses was not significantly affected by the overwintering environment of the queen or the workers. These results could be due to inadequate sampling size and/or other factors also affecting the colonies of study.