

DIPLOID DRONE SUBSTANCE — CANNIBALISM SUBSTANCE

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Drone larvae which hatch from fertilized eggs are eaten by the worker bee 6 hrs. after hatching. The cause of this phenomenon is not known.

Eggs laid by sibling mated queens producing 50% of diploid drones were hatched in the incubator. Part of the larvae was reared there for several hours on bee milk. Next live, dead or extracted larvae were added as second individuals to larvae of similar age in the comb cells in the colony. As a control normal larvae were added also as second individuals to other cells.

In the first experiment only normal larvae were added. It was found that both larvae survived one and two days later in 93% and 86% of cells. Similar results were obtained when haploid drone larvae were added to the female larva. Thus the bees reared two larvae in a single cell almost normally during the first days.

After larvae of sibling mated queens were added, both larvae were found two days later only in 53% of cells. Both larvae were females. In the other half of cells where one of the larvae was diploid drone, the both larvae were eaten. Both larvae were eaten also in 50% of cells when the low survivals were added to the drone cells. Thus a predominance effect of the diploid drone larvae on normal female as well as diploid male larvae was found.

After the low survival larvae were hatched in an incubator, reared there for several hours, killed and then added to the colony, both larvae were found two days later in 50% of cells, similar to the live larvae. Thus a different behavior of the diploid drone larvae is not the cause of eating, but rather a substance produced by them.

After the larvae were extracted with alcohol at first, and then added as second individuals, both larvae were found two days later in 47% of cells containing the added low survivals and in 83% of cells with the normal ones. Thus alcohol did not extract any substance causing the eating phenomenon.

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Additional extraction in benzene resulted the second day in 80% of cells containing both larvae of which one was the low survival, and in 95% of cells with both normal larvae. Similar results were obtained with ether or hot alcohol. Here the extraction eliminated in high degree the eating phenomenon.

This shows that the young diploid drone larvae must produce some substance causing the eating phenomenon. The substance is soluble in benzene and some other organic solvents and thus can be a kind of lipid. The eating phenomenon can be eliminated by extracting this substance.

So a biological test for the substance was found, evidence of its existence is given and some characteristics of it are described.

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