

during which time they encountered an average of 16.9 ± 9.5 nestmates and engaged in food exchange 5.5 ± 2.4 times.

Toward the end of the recruitment process, the incoming recruiter workers experienced increasing difficulty in getting rid of their food, due to the fact that a large percentage of the nest workers already had filled or partially filled crops. By this stage the rate of trail-laying and the outward flow of workers decreased markedly (Fig. 4).

Although recruitment to food masses was accomplished mostly by major workers (which further conducted all of the foraging), a small number of minor workers also emerged from the leaf nests when excitement in the colony was highest. The largest number we saw outside at any moment was seven; at the same moment 187 major workers were in the foraging area. The minor workers did not venture far beyond the leaf nests. Only rarely did one come all the way off the tree and onto the flat surface of the arenas.

After traffic to a large sugar source had run for a while, the ants accumulated one to several persistent trunk trails that led in a relatively straight line from the food to the nest. The workers were able to travel accurately along the trails, increasing the rate of transport in the average volume of liquid carried per ant.

b) Glandular Source of Trail Pheromone. Because many species of formicine ants lay trails with hindgut contents, we tried to trace the hindgut material

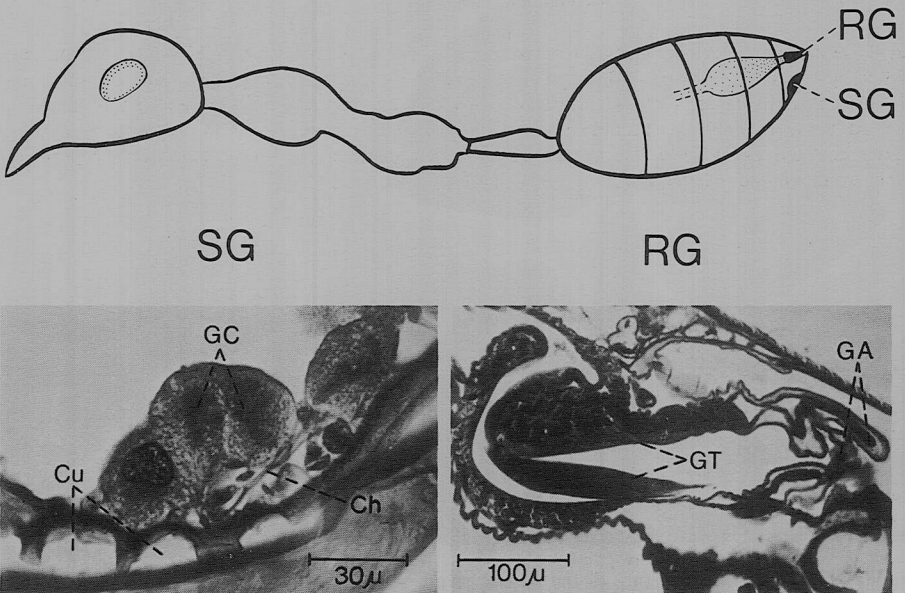


Fig. 5. The two newly discovered exocrine glands of *O. longinoda* are depicted in this diagram of a major worker. The lower photographs show longitudinal sections of the glands. The sternal gland (SG) consists of cells (GC) lining the inner wall of the terminal abdominal sternite; they are connected by intracellular channels (Ch) to outer cups (Cu) in which the pheromone accumulates. The rectal gland (RG) is an infolding of the rectal wall that includes glandular tissue (GT) and an eversible gland applicator (GA)