

## The Multiple Recruitment Systems of the African Weaver Ant *Oecophylla longinoda* (Latreille) (Hymenoptera: Formicidae)

Bert Hölldobler and Edward O. Wilson

Museum of Comparative Zoology Laboratories, Harvard University,  
Cambridge, Massachusetts 02138, USA

Received April 20, 1977

**Summary.** 1. African weaver ants (*Oecophylla longinoda*) utilize no less than five recruitment systems to draw nestmates from the leaf nests to the remainder of the nest tree and to the foraging areas beyond: (a) recruitment to new food sources, mediated by odor trails produced from the rectal gland, a newly discovered exocrine organ, together with tactile stimuli presented during mouth-opening, antennation, and head-wagging; (b) recruitment to new terrain, entailing odor trails released from the rectal gland and tactile stimulation through antennation; (c) emigration to new sites; (d) short-range recruitment to territorial intruders, during which the terminal abdominal sternite is maximally exposed and dragged for short distances over the ground to release an attractant from the sternal gland, a second newly discovered structure; and (e) long-range recruitment to intruders, mediated by odor trails from the rectal gland and by antennation and intense body jerking.

These systems exist in addition to the elaborate pheromone-mediated alarm communication previously described by Bradshaw et al. (1975). In aggregate, the alarm and recruitment systems of *O. longinoda* constitute the most complex of such repertoires thus far discovered in ants.

2. Weaver ants recognize new terrain by means of both visual and olfactory cues, with the latter being the more effective. When major workers cannot cross gaps to the terrain by walking, they attempt to make the traverse by building bridges with their bodies. Individuals are attracted to the bridge site visually, but when the bridge is complete, they recruit nestmates to the new terrain with rectal-gland odor trails.

3. Workers mark newly acquired home range with randomly placed drops of fluid extruded from the rectal vesicle. They distinguish their own domain from that of alien conspecific colonies in part by means of the odor of the anal spots. When a section of terrain is found unmarked, the rate of anal-drop deposition is accelerated, even when adjacent areas are already heavily marked.

4. The anal substance is a true territorial pheromone: workers respond to alien spots initially with hostility and aversion, then by recruiting nestmates