

## MOTOR DISPLAY AS A MEANS OF RECRUITMENT TO FOOD IN ANTS

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The main means of social communication in recruitment to food is considered to be chemical. It has been proved that by means of a pheromone trail the scouts are able to recruit additional foragers. The scent trail also directs the ants to the food source.

In addition to chemical recruitment motor display has been found to play an important part in recruitment to food (Szlep & Jacobi, 1967; Szlep, 1970 and Hölldobler, 1971). The display consists of running, head oscillations and antennal beatings, and stimulates the foragers in their search for food.

In trail-laying ants, chemical and the tactile communication (by means of a motor display) are interconnected. The part played by motor display differs between species. In some it appears only inside the nest, and not outside. In others (Crematogaster) it is also found on the way to the nest (Leuthold, 1968).

In some species, the recruitment to food is achieved mainly, if not solely, by a motor display (Cataglyphis, Formica, Polyrhachis). This display is performed in a state of high food excitation. It is performed on the way to the nest, inside the nest and on the return journey to the food. The significance of the display as a means of recruitment can be observed in a pure form in Cataglyphis. In these species the foragers hunt separately, scattering in different directions from the nest. The displaying ant excites a group of foragers and brings about an emergence from the nest and searching for food in different directions.

In Formica and Polyrhachis there is a great deal of display outside the nest, on the way to the nest, and also on the return journey to the food source. The recruited ants are in this way directed to the food source. The display has a double function; to excite and to direct.

The Cataglyphis display is a weaker means of recruitment compared with compound recruitment by trail and display. Repeated runs bring, nevertheless, a considerable number of foragers to the food.

It is suggested that the motor display evolved from food sharing behaviour. It differs from the invitation to feeding by the increase in speed and the decrease in actual feeding. Even in cases when food sharing starts it is soon interrupted. There is also evidence for a lasting effect of the display, which exceeds the period of invitation to food sharing.

On its way back to the food source the recruiter leaves the excess of food in the nest. The display is now simply a ritualized means of recruitment.

The development of a strong pheromone trail diminishes the importance of the motor display. However, in species with a weak

and short-lasting scent trail, the role of the motor display in recruiting increases.

The evolutionary development of the means of social communication seems to be in two directions. On the one hand there is a strengthening of the chemical trail and on the other, strengthening of the motor display by prolonging its duration.