

Spezifität und Inaktivierung des Spurpheromons von *Lasius fuliginosus* Latr. und Orientierung der Arbeiterinnen im Duffeld*

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Specificity and Inactivation of Trail Pheromone in Lasius fuliginosus LATR. and Orientation of Ant Workers in the Scent Field

Summary. 1. The trail substance of *Lasius fuliginosus* is neither colony nor caste specific. All tested species of the subfamily Formicinae accumulate their trail substance in the rectal ampulla. The *fuliginosus* workers can interpret all formicine trail substances with the exception of that from *Lasius flavus*, but the secretions in their own rectal ampullae can be understood by none of the other species tested. The trail substance of *Lasius fuliginosus* is, therefore, highly species specific. This specificity is independent of the concentration of the test solution.

2. The activity of the trail substance from *Lasius fuliginosus* can be lost through the action of pure oxygen, heat or sodium hydroxide. However, it proved to be stable against the effects of atmospheric oxygen and sunlight. The duration of action of an artificial trail is dependent on the volume of substance employed and the porosity of the surface. An inactivated trail can be reactivated by moistening with water or other solvents. This reactivation fails, however, when the trail is prevented from drying out during the entire inactivation time.

3. Through studies with animals whose antennae had been unilaterally amputated or crossed it was possible to demonstrate osmotropotaxis during trail following. After unilateral antenna amputation, a clear veering tendency toward the intact side was observed along the artificial trail as well as in the diffuse scent field. This veering tendency was noted to increase with increasing concentration of the trail substance solution. Animals with crossed antennae consistently entered the scent-free arm of a unilaterally scented T-path. When workers were allowed to follow a double trail, one side of which became suddenly weaker, it was observed that by asymmetric placing of the antenna tips in the scent path the animals could detect a concentration difference between left and right.

Zusammenfassung. 1. Die Spursubstanz von *Lasius fuliginosus* ist weder kolonie- noch kastenspezifisch. Alle getesteten Arten der Unterfamilie Formicinae speichern in der Rektalampulle eine auf die eigene Art spurbildend wirkende Substanz. Die *fuliginosus*-Arbeiterinnen können diese Spursubstanzen mit Ausnahme derjenigen von *Lasius flavus* lesen, während ihre eigene Rektalampullen-Flüssigkeit von keiner der getesteten Arten verstanden wird. Die Spursubstanz von *Lasius fuliginosus* ist hoch artspezifisch. Diese Spezifität geht auch bei verschiedenen Konzentrationen der verwendeten Spursubstanz-Lösungen nicht verloren.

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