

# THE INTERACTION OF SURFACE AND DUST PARTICLE SIZE ON THE PICK-UP AND GROOMING BEHAVIOUR OF THE GERMAN COCKROACH *BLATTELLA GERMANICA*

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The relationship between the particle size of an inert silica dust, its up-take from different surfaces and grooming behaviour of male, gravid female, and 5th & 6th instar nymphs of the German cockroach *Blattella germanica*, was investigated. The normal grooming behaviour of gravid females, nymphs and males differed according to sex and age. The gravid females and nymphs had the highest grooming response especially of the antennae and second legs.

The gravid females, nymphs, and adult males exhibited increased grooming behaviour after exposure to dust in the size range 0.5-63  $\mu\text{m}$  but there was no significant difference ( $P < 0.05$ ) in cockroach behaviour from the control for dust sizes greater than 70  $\mu\text{m}$ . The highest grooming response of the legs and antennae occurred with dust particle size 2 (4.5-7.5  $\mu\text{m}$ ) followed by 1 (0.5-5  $\mu\text{m}$ ), 3 (10-40  $\mu\text{m}$ ), 4 (40-63  $\mu\text{m}$ ) and 5 (70-140  $\mu\text{m}$ ) for adult males, gravid females and 5th & 6th instar nymphs. Antennal grooming of males was higher than leg grooming for all dust sizes except size 2 where there was no significant difference ( $P < 0.05$ ). In the case of females there was a significant difference between antennal and leg grooming only for dust sizes 1 and 2.

With the fifth and sixth instar nymphs all dust sizes produced significant differences in grooming behaviour, but in each case there was no difference between leg and antennal grooming.

A dust pick-up experiment clearly indicated that the average amount of dust transferred to the German cockroach is indirectly proportional to the particle size and also is dependent on the porosity of surface, sex and age of the cockroaches. Gravid females picked up greater amounts of dust than nymphs and males, while the (5th & 6th instar) nymphs picked up greater amounts than males.