THE GENETICS OF BEHAVIOURAL RESISTANCE IN THE BIRMINGHAM HOUSE MOUSE (*MUS DOMESTICUS* RUTTY)

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Over the last twenty years controlling the house mouse (*Mus domesticus*) in the centre of Birmingham had become a serious problem. Since the early eighties various pest control contractors have used a wide range of anticoagulant rodenticides to no avail. A previous study, sponsored by Rentokil, indicated that the house mice residing in the city centre of Birmingham are not only resistant to anticoagulant poisons but also exhibit unusual behaviours through being extremely difficult to trap and having very distinct dietary preferences (Humphries *et al.*, 1992). This very localised phenomenon has since been termed 'behavioural resistance' due to the combination of anticoagulant resistance and specific behavioural traits. Humphries (1994) suggested that there could be a genetic basis for this phenomenon through introduced selective pressures from intensive poisoning campaigns. Therefore, the work outlined here is being conducted, in conjunction with Rentokil, to test the hypothesis that there is a genetic basis for behavioural resistance through the analysis of the genetic diversity of Birmingham house mice compared with other house mouse populations. Also, further behavioural studies are in progress in order to continue the accumulation of information on the ecology of urban house mice in general and Birmingham house mice in particular. The main technique being utilised in this investigation is that of DNA profiling. This involves first live trapping animals in known resistant and non-resistant urban areas, and in rural sites. These animals are subsequently humanely killed, weighed and sexed with standard autopsy measurements being taken before storage in a freezer. Tissue samples (the tip of the tail) are then taken for multilocus DNA fingerprinting for which a range of protocols are being followed (see Russell *et al.*, 1993 for details). The Jeffreys probe 33.15 is being used with a range of restriction enzymes to assess the best combination for further analysis (*Alu*I, *Hae*III, *Hind*III, *Hinf*I). It is hoped that these enzymes will fragment the DNA sufficiently to pick up any variation that may be occurring between the populations through highlighting differences in the barcode-like patterns produced as the end product of the process. The ultimate aims of this project are to contribute to the understanding of behavioural resistance and the general ecology of the phenomenon.

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