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THE BEHAVIOURAL RESPONSE OF A SMALL PREY ANIMAL TO THE ODOUR CUES OF FAMILIAR PREDATORS IN A NEW ZEALAND MODEL SYSTEM.

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ABSTRACT

There is a rich ethological literature examining the effects of predators upon the behaviour of their prey. There are also apparent discrepancies in results reported particularly with respect to wild versus domesticated or captive subject species, and especially amongst Rodentia where predator avoidance behaviours predominate. Using New Zealand as a model system, the aims of this thesis were to determine how prey animals respond behaviourally to a familiar predator odour; to evaluate the role of predator exposure in prey behaviour; and to test whether captive-derived results are applicable in wild populations.

I undertook experiments under three different conditions: the standard laboratory Y-maze choice test, an enclosure test, and a field test. In each experimental scenario the prey (ship rats) were initially presented with odour treatments derived from a familiar predator (stoat), familiar non-predator (possum) and novel non-predator (chinchilla). The rats' behaviour was then video recorded for analysis of either avoidance or non-avoidance behaviour. The captive enclosure rats and the free-living rats exhibited clearly definable non-avoidance responses to stoat odour, but in the Y-maze the same captive rats did not exhibit a consistent response.

I hypothesized that the non-avoidance behaviours represented a form of predator inspection behaviour. Further captive enclosure and field experiments aimed to test whether the non-avoidance response to stoat odour was specific or generalized. Under both conditions the most marked non-avoidance behaviour was in response to male stoat and secondarily to the mixed sex cat odour. My research concluded with a snap trap experiment pairing stoat-odour lure and no-odour snap traps, yielding an overwhelming capture success in the stoat-odour lured traps.

Significant developments in the study of predator-prey behaviour resultant from this research include the development of a captive experimental protocol that generates comparable field results, the description of non-avoidance responses to predator odour, and the reporting of predator inspection a behaviour previously unreported in ship rats and rarely reported within Rodentia. Future studies should aim to verify the non-avoidance behaviours in other rat species as a first step to determining whether this is a ship rat specific behaviour, or if its lack of expression in other rodents is an experimental artefact.

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