

Hands off the poison – our mice don't need it

GOOD news for Australian wildlife with a recent study suggesting that mice numbers could be controlled with much smaller doses of poison.

Edith Cowan University (WA) Honours student Bridget Duncan tested the resistance of mouse populations in metropolitan Perth to a common and particularly potent brand of rat poison.

Her study showed house mice are particularly vulnerable to rat poison in Western Australia.

She and her supervisors were surprised to discover local mice lacked a gene mutation found in mice around the world that helps to resist the effects of rat poison.

"Mice in Europe, the United States and Canada have all been found to carry this mutation and we assumed that mice in Western Australia would be the same," Bridget said.

"But, results told a different story. This is particularly surprising as rat poisons are much more accessible to consumers in Australia compared to other parts of the world and we assumed they would have built up resistance over time."

This was the first investigation to test for this mutation in Australian mice and results may have implications for mouse control around the country.

Building resistance over time

Rat poisons such as warfarin has been used to control rodents for more than 80 years, and as rats and mice developed resistance to these chemicals, a new generation of more potent chemicals were developed.

"Over time the population gains resistance through animals inheriting the protective genetic mutation from the survivors over generations," Bridget said.

"As a result, the extremely potent second-generation chemicals are now widely used around the world, including Australia, where they have a devastating effect on the local wildlife.

"Small native mammals, birds and reptiles are all killed by these potent poisons, but our research has indicated there might be no need to be so heavy handed with these chemical controls."

Bridget said the research team had speculated why Western

TESTING THE GENETICS

The house mice in Perth and the ones that cause damage to crops and stored grain across Australia are the same species. Unfortunately nobody has tested to see if resistance genes are present in populations in WA's grain belt or in the eastern states.

The genetic strain of house mice we found in the Perth region is the most common strain found in Australia. Again, we have not tested any mice in the eastern states. It is likely that the eastern Australian wheatbelt harbours house mice from a different genetic strain, which is also likely present in the WA wheatbelt along with the Perth mice.

House mice in Australia shows relatively little genetic diversity and we can trace its origins clearly to European settlement, with links to the British Isles and The Netherlands.

Australia mice were so different from populations in other parts of the world, but more research needed to be done.

"Mice in the Perth metropolitan area are all very similar to each other and are most closely related to British population of mice," she said.

"It is possible that Australian mice arrived on the early settler ships before this genetic mutation arose in the British population."

Researchers also sampled mice on Browse Island in the remote Kimberley to compare against the Perth metropolitan mice.

"We found the mouse population on Browse Island was more closely related to south-east Asian mice so probably originated from Indonesian fishing boats," Bridget said.

"They also lack resistance to common poisons so environmental managers can employ a very measured approach to population control through this method."

Next steps in the research will examine the resistance of rats in Western Australia to the same poisons.

The study *Mus musculus* populations in Western Australia lack VKORC1 mutations conferring resistance to first generation anticoagulant rodenticides: Implications for conservation and biosecurity can be read in full in the PLOS ONE journal. ■



House mice in Perth lack a gene mutation found in mice around the world. This means Perth mice are much more susceptible to rat poison. Further research is needed but it is likely that this resistance gene is also lacking in the mice causing damage to Australian grain crops.