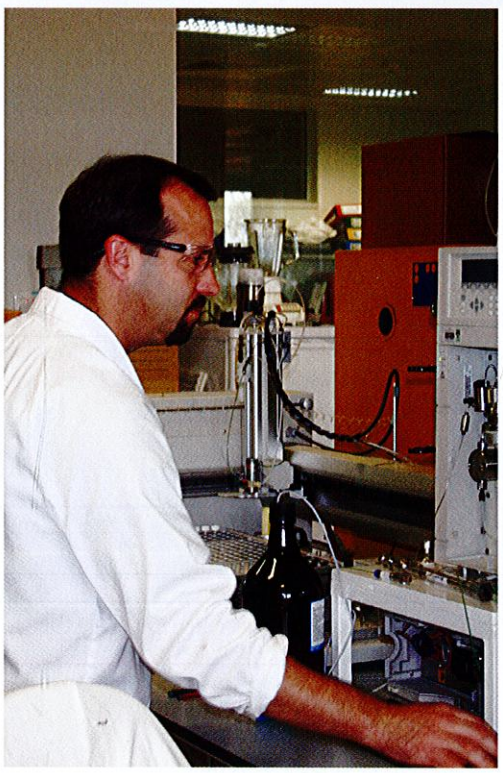
Science, a weed and cat control

A plant that attracts cats to chew the roots and then roll about in an apparent drug-induced stupor? Could this be true? Department of Parks and Wildlife scientists set out to investigate and determine if such a plant can aid cat control efforts.



by Dave Algar, Neil Hamilton, Don Nickels and Gavin Flematti

While conducting research into feral cat control on Christmas Island, several local residents told us of a plant on the island that had a peculiar effect on cats. The behaviour was particularly noticeable when people weeded their gardens and exposed the roots of the plant. Pet cats and strays—and there were many before the start of a cat control campaign—would wander into the gardens and pick this plant out of the weed heap. They would chew the roots and then roll in them in what appeared to be a drug-induced stupor. If the plant was taken away from the cat it became aggressive and attempted to regain the material.

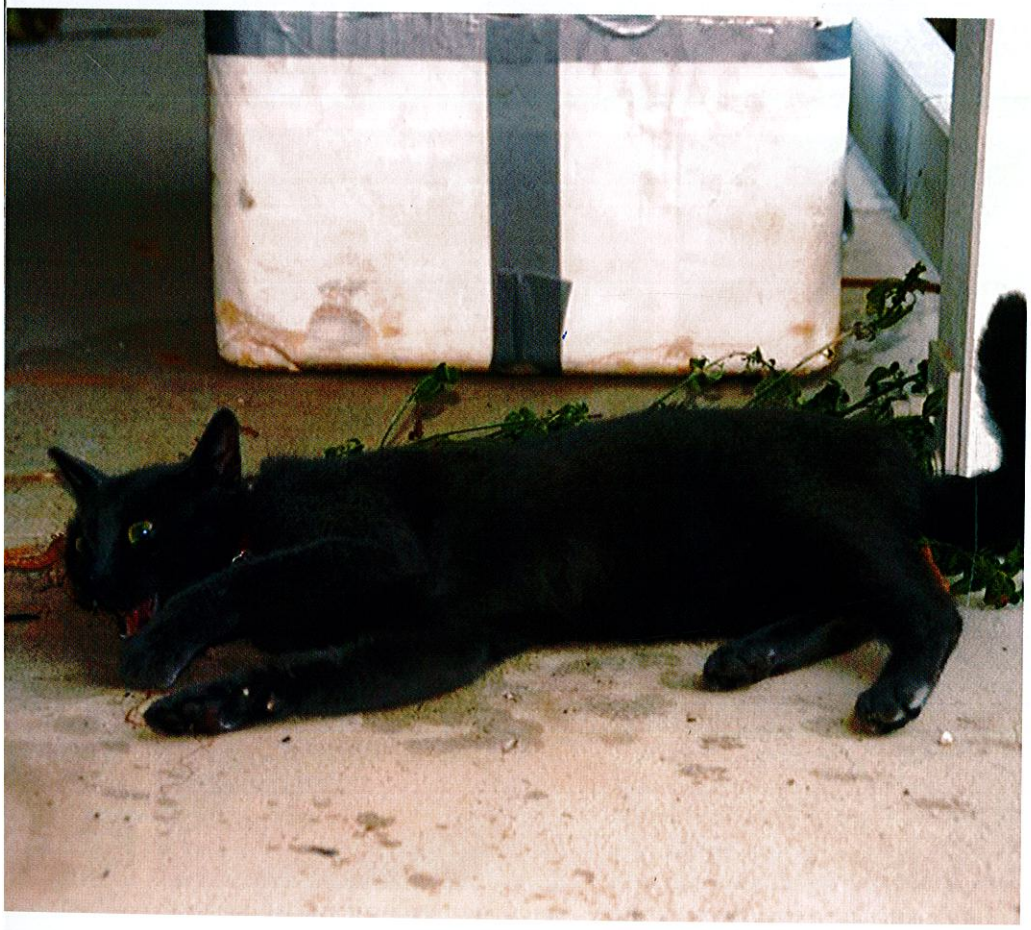
We followed up on these reports and found that the plant was a species called *Acalypha indica* and did indeed induce this behaviour in cats. *Acalypha indica* belongs to the family Euphorbiaceae and is also known by the common names Indian acalypha, Indian nettle and three-seeded mercury. The species occurs throughout tropical Africa and South Africa, in India and Sri Lanka, as well as in Yemen and Pakistan and was probably introduced to Christmas Island where it has become a weed. The plant grows up to 75 centimetres tall and has ovate leaves and green flowers. A literature search revealed that, where the plant grows, it is widely known for its effect on domestic cats, which respond very tenaciously to the root of the plant.

The plant also has medicinal properties and has been used to cure ringworm, rheumatoid arthritis, scabies-infected wounds and more. It is also browsed by cattle, but whether it produces the same narcotic behaviour is not documented.

Enticing cats

Could this plant be used to improve our cat control techniques as an addition to the bait medium, or be used as a lure to survey cat numbers? Pilot trials conducted on Christmas Island showed that the roots lost their impact on cats after being exposed to the atmosphere for a number of days; so we could not grind up root material and use that. It was therefore important to determine which chemicals in the plant's root affected the cats, whether they could be manufactured synthetically, and whether loss of volatility could be prevented.

Initially, a number of plants were brought to the mainland, under Australian Quarantine and Inspection Service permits, to provide fresh root material for chemical analysis. Following fumigation and the regulatory quarantine period, roots were removed and analysed but unfortunately the chemicals could



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Main *Acalypha indica*.
Inset left A cat in an apparent drug-induced stupor after chewing roots of *Acalypha*.
Inset right Gavin Flematti at work in the School of Chemistry and Biochemistry laboratory at UWA.

Above *Acalypha indica* growing on a roadside verge.

Left A cat rolling in plant roots.
Photos – Neil Hamilton/DPaW

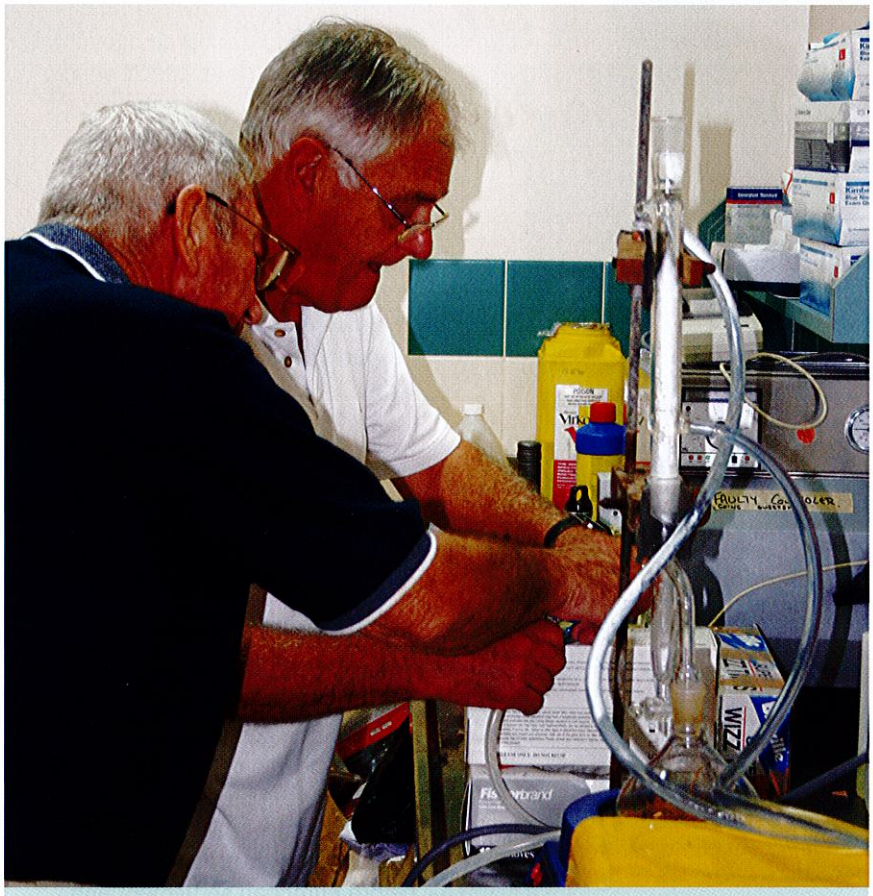
not be identified. We then contacted the School of Chemistry and Biochemistry at The University of Western Australia (UWA) for advice and decided a collaboration between the two organisations would be the best way forward. We conducted chemical extractions on fresh root material at Christmas Island and provided these extracts to UWA for chemical analyses. Vacuum absorption traps were also used to trap volatile compounds emitted from fresh root material.

A compound combination

Chemical analyses of the extracts, and in particular the absorption traps, revealed the presence of two compounds known to cause behavioural responses in cats. The occurrence of these two compounds, not normally found in the same plant, is suspected to have a synergistic effect and therefore be responsible for the elevated reaction in cats. The two compounds are now being prepared synthetically at UWA and, following further testing, this may lead to them being incorporated into baits and lures.

Top A cat chewing plant roots.

Above right Don Nickels (foreground) and Keith Hywood (background) performing chemical extractions on root material on Christmas Island.
Photos – Neil Hamilton/DPaW



Dave Algar is a senior research scientist at the Department of Parks and Wildlife's (DPaW's) Science and Conservation Division at Woodvale. He has worked throughout Western Australia conducting research on feral cat control for the past 20 years. He can be contacted by email (dave.algar@dpaw.wa.gov.au).

Neil Hamilton is a senior technical officer at the DPaW Science and Conservation Division at Woodvale. He has worked on feral cat research under the fauna conservation program for the past 10 years. He can be contacted by email (neil.hamilton@dpaw.wa.gov.au).

Don Nickels is a registered veterinary surgeon with 45 years' experience working with cats and now consulting with DPaW on cat management and control. He can be contacted by email (nickelsd@bigpond.net.au).

Gavin Flematti is a researcher in the School of Chemistry and Biochemistry at The University of Western Australia. His work involves identifying naturally derived compounds that have some form of biological activity. He is currently funded through the Australian Research Council's Future Fellowship scheme. He can be contacted by email (gavin.flematti@uwa.edu.au).

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Editors Samille Mitchell, Joanna Adele, Mitzi Vance, Karla Graham.

Scientific/technical advice Kevin Thiele, Lachie McCaw, Keith Morris.

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Illustration Gooitzen van der Meer.

Cartography Promaco Geodraft.

Marketing Cathy Birch.

Phone (08) 9334 0296 or *fax* (08) 9334 0432.

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