



A little gecko tells a big story



Clawless geckos in the Kimberley are secretive creatures which scientists are only now starting to learn more about.

by Russell Palmer, Viki Cramer and Paul Oliver

The Kimberley rests in our imagination as one of Australia's, if not the world's, last great wild places. The classic image of the Kimberley is one of rugged sandstone formations rising above a sea of savanna; or of cascades of monsoonal rain falling to the ocean over deeply weathered cliffs. Yet it is under rocks on unassuming scree slopes and within clumps of spinifex, and in other small and overlooked places, that surprising discoveries for biodiversity are found. This is where the secretive clawless gecko (*Crenadactylus* sp.) hides. Recently, a major collaboration between Australian museums and universities has revealed a remarkable underestimation of species diversity in Australian reptiles, including the clawless gecko. Field surveys in the Kimberley islands are contributing to this research, and helping to unravel the hidden identities of Australia's smallest gecko.

Cryptic geckos

The clawless gecko is a 'cryptic' species; a term that—somewhat ironically—does not refer to its reputation as being a gecko that is secretive, rare and difficult to collect. Biologists refer to a complex of species as cryptic when two or more species are so similar in external appearance

that they are mistakenly believed to be the same species. Recent genetic analysis of the clawless gecko has shown that what was once thought of as a single widespread species found across much of Western Australia and the Northern Territory includes at least 10 species. Revealing the true diversity of cryptic species is not only essential for species conservation, but also provides important clues to the climatic and biogeographic history of Australia across geological time.

One of the main barriers to this research has been the limited availability of tissue samples for genetic analysis, particularly from remote areas such as the Kimberley, where a systematic survey of reptiles had not been conducted. Of the five potential Kimberley species previously identified by scientists at the South Australian and WA museums, genetic material for four species was only available from a single location. In 2007, the Department of Environment and Conservation (DEC), in collaboration with the Kimberley Land Council, WA Museum and Australian Museum, began field surveys in the Kimberley islands (see 'Treasures of a sunken coastline: a biological survey of the Kimberley islands', *LANDSCOPE*, Winter 2008). The surveys aimed to

increase knowledge of the biodiversity and conservation status of the islands, particularly in light of increasing threats to fauna and flora on the Kimberley mainland from changed fire regimes and feral animals, including the cane toad (*Bufo marinus*).

High diversity and limited distribution

Biologists recorded 75 species of reptile during the survey, 17 of which had not been recorded on the Kimberley islands before. The clawless gecko lived up to its reputation: of the more than 2,500 individual reptiles captured over 300 days of survey time on 24 islands, only 11 were clawless geckos. Despite long hours installing funnel traps along drift fences at each site, not a single clawless gecko was caught in the traps. Some were caught by land snail expert Vince Kessner as he turned over rocks searching for aestivating snails (see 'Diversity hot spot revealed: land snails of the Kimberley',

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Main Aerial view of the Kimberley islands.

Photo - David Bettini

Inset Kimberley island clawless gecko.

Photo - Brad Maryan

Below A helicopter landing on an island in Talbot Bay.

Photo - Russell Palmer/DEC





Above Traditional owner John Jangoot checking a funnel trap for reptiles on Coronation Island.

Below right One of the trap lines set on Adolphus Island.

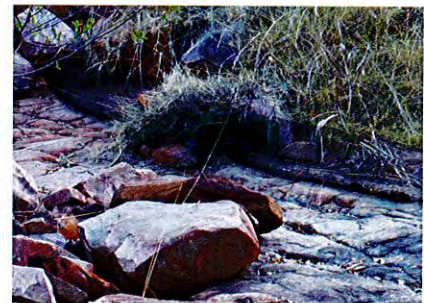
Below left Hilltop view of Adolphus Island, which is home to one of the new species of clawless gecko.

Photos – Russell Palmer/DEC

LANDSCOPE, Spring 2010). One clawless gecko was momentarily disorientated by the downwash of the rotor blades of a landing helicopter and scurried out from beneath a rock, only to be caught thanks to the quick reaction of DEC research scientist David Pearson.

Genetic work revealed that the 11 specimens collected during the Kimberley island survey were four separate species with geographical ranges of less than 100 kilometres by 100 kilometres. At least two species are known from only a single island. Thus the clawless geckos of the Kimberley are not only multiple cryptic species, but are also short-range endemics: a species group with high diversity but with very limited distribution

(see 'Spineless impact assessments', *LANDSCOPE*, Summer 2010–11). Both cryptic species and short-range endemics require special consideration in conservation planning, as a single development or severe disturbance may irreversibly impact much of a species' population and habitat. With continued mining exploration and development in the Kimberley, the advance of the cane toad, and loss of habitat through an increase in frequent and intense fires, identifying such species in poorly surveyed areas on the Kimberley mainland is paramount. If such diversity in the clawless gecko can be recognised from just 11 individuals, clearly there is much yet to discover about the little things that inhabit one of our last great wild places.



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