



## ACTHA CONTACT DETAILS

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## ACTHA NEWS JUNE - JULY 09

Newsletter of the  
ACT Herpetological  
Association Inc.

### DIARY DATE

The *bi-monthly* meetings of the Association are held on the *third Tuesday of the month* at 7.30pm, West's Southern Cross Club, Catchpole Street, Macquarie, Belconnen.

### UPCOMING MEETING

**Tuesday, 16 June 2009**

**Guest Speaker: Renee Catullo**

School of Botany and Zoology, ANU

#### \* **Why little brown frogs aren't boring!**

Renee will be talking about the Myobatrachid frog genus *Uperoleia*. There are currently 26 described species of *Uperoleia*, distributed in a wide range of habitats, from tropical rainforest, to dry local forests, to the middle of the Simpson desert. Despite the fact that these animals are adapted to a wide range of habitats, they look extremely similar. Renee's PhD research involves completing a genetic scan of all specimens to understand how many species there are, and the true range of individual species. Her work thus far has shown a high number of as yet unidentified species, and that the range of various species is highly different from currently believed

#### \* **What did the python say to the goanna?**

Some of you may have seen a series of amazing photos showing a python eating a goanna (*p 3*). **There will be a small prize at the upcoming ACTHA meeting** on June 16th for any members under the age of 12 who can identify the species of both the python and goanna correctly!

#### \* **In addition, Peter Child of Reptiles Inc. will be bringing the snake shown in the photos and a very closely related goanna to the meeting for everyone to see in the flesh - this is an opportunity not to be missed!**

### YOUR COMMITTEE

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Student Representative	Jake McAuliffe

### IN THIS ISSUE

#### ***Female Lake Eyre Dragons use colour to stop unwanted attraction***

These female dragons use their colour in the opposite way to most, *page 2*.

#### ***Snake wolfs down large goanna***

Internet pictures draw huge interest, *page 3*.

#### ***Humble roof tile fills ecological niche***

Lack of grassland rock habitat makes NPW Rangers think outside the square, *page 4*.



#### ***Understanding the Beak-faced Gecko***

Mitzy Pepper, ANU, was our April 09 guest speaker. Read all about her gecko exploits and exciting new discovery, *page 5*.

#### ***Boy or Girl? In lizards, egg size matters***

Another discovery on lizard sex determination, *page 7*.

#### ***Australia frog field guide plates available for sale soon***

Details *page 8*.

## FEMALE LAKE EYRE DRAGONS USE COLOUR TO STOP UNWANTED ATTRACTION

Anna Salleh, ABC, 29 April 2009

Source: <http://www.abc.net.au/science/articles/2009/04/29/2555087.htm>

Dr Devi Stuart-Fox, Evolutionary ecology, University of Melbourne and colleagues, report their findings online ahead of print publication in the *Journal of Comparative Physiology A*.



Surprisingly, this pose of a female Lake Eyre dragon lizard (with bright orange markings on the belly and under the chin) stops unwanted males from mating with her.

Females of an Australian species of lizard rely on testosterone for a most unusual method of keeping amorous males off their back, researchers have found.

In most animals that use colourful displays for attraction, it's usually the male that's flashy, such as the peacock.

But the female Lake Eyre dragon lizard (*Ctenophorus maculosus*) is an exception. She displays a bright orange belly and throat during parts of her breeding season, which researchers think is driven by the hormone testosterone.

Interestingly, the colour features prominently when the female wants to put off a male from copulating with her.

Stuart-Fox and colleagues took a close look at a number of female lizards taken from Lake Eyre in South Australia and observed what happened when they were in the company of males.

### PERSISTENT MALES

When Lake Eyre lizards copulate the male bites the female's neck, climbs on top of her, wraps his tail around hers and inserts one of his two penises.

This can be hazardous to the health of the female because when the males bite them on the neck this can pierce the female's spine and result in death.

Therefore once the female's eggs have been fertilised, she will try to avoid mating. But males aren't easily put off.

"The males are really persistent," says Stuart-Fox. "They try and force copulation and they harass females all through the breeding season."

**Unreceptive females scare off advancing males by taking on a threatening posture.**

**If this doesn't work, they throw themselves on their backs and reveal their bright orange underside.**

"Males can't actually force themselves onto a female when she's on her back," says Stuart-Fox.

### SEX STEROID

Stuart-Fox also measured the levels of sex steroids in blood samples taken from the lizards over time.

Progesterone and testosterone usually decrease once female lizards are no longer receptive to mating, but not in the Lake Eyre dragon lizard.

"They maintain high testosterone levels all through the reproductive cycle including when they weren't receptive later in the cycle," says Stuart-Fox.

The researchers believe the testosterone is used to drive the female courtship rejection behaviours.

### WAR OF THE SEXES

Sexual conflict between persistent males and reluctant females has led to an evolutionary tit for tat involving all manner of behaviours, says Stuart-Fox.

"You get this runaway process where males evolve elaborate ways of trying to gain matings and females evolve elaborate ways of trying to avoid matings," says Stuart-Fox.

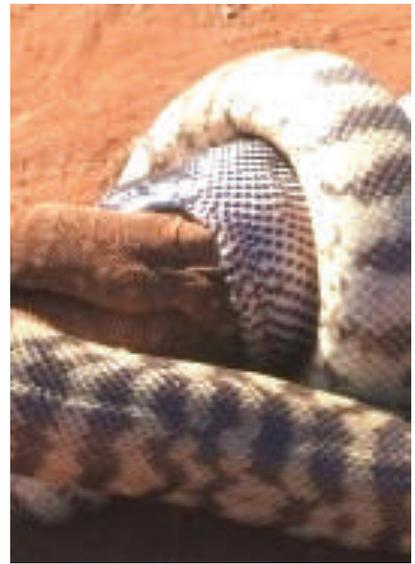
But she wondered about the evolutionary benefit to females of spending time on their back, which makes it difficult for them to run away from predators.

Especially given they live in a rather drab landscape, the bright orange could be a flag to predators that says "come and get me", says Stuart-Fox.

But she says more recent studies have suggested predators do not recognise the brightly-coloured female lizards as prey.

So, says Stuart-Fox, the risk of being vulnerable to prey is much lower than the risk of having unwanted sex.

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## SNAKE WOLFS DOWN LARGE GOANNA

Tues 12 May 2009  
By Jay Savage, ninemsn

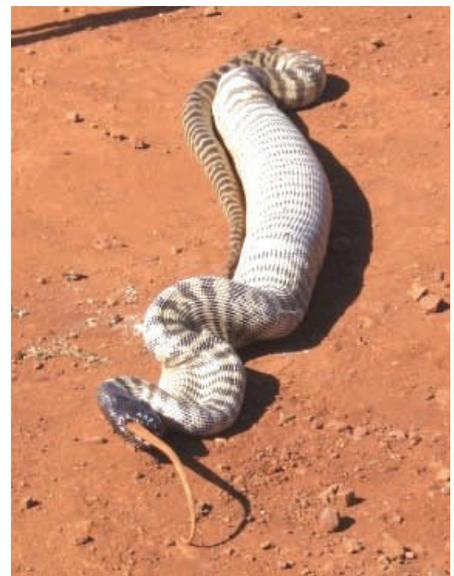
**Amazing images of a snake devouring a goanna in outback Western Australia have "exploded" into e-mail inboxes around the world.**

Engineer Trevor McGowan, who took the photos, said he and his workmates watched on stunned as the snake consumed the giant lizard over about five hours near Cloudbreak Mine in the Pilbara region last week.

The Irishman said he took the pictures early in the day and when he returned later he saw the goanna's "bulge outline" inside the snake.

"I sent the pictures to a couple of mates back home and it just exploded — the e-mail went around the world and came back to me," he said

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## HUMBLE ROOF TILE FILLS ECOLOGICAL NICHE

*News Release 25 May 2009*

*NSW National Parks and Wildlife Service*

*Media contact Stuart Cohen*

The humble terracotta roof tile has found an environmentally friendly role being recycled as important grasslands habitat and survey tool in Turallo Nature Reserve at Bungendore.

The 25 hectare Turallo Nature Reserve is one of the region's finest examples of natural temperate grassland, an ecosystem now regarded as among the most threatened in the country.

The reserve was declared in 2003 to protect a high quality remnant of native grassland and the unique flora and fauna that it supports.

NPWS Ranger, Dr Damon Oliver, said today that the roof tile was filling two important roles within the reserve.

"It's 25 hectares of native grassland with very few trees and almost no rock so habitat for some grassland reptiles in this space is quite limited.

"About five years ago we spread the tiles around the reserve to create habitat and to survey the site for wildlife.

"The special thermal qualities of the roof tile attracts animals such as the threatened Little Whip Snake, other small grassland reptiles, frogs such as the Spotted Marsh Frog as well as a range of invertebrates including the rare and spectacular Canberra Raspy Cricket.

"The roof tiles are now readily used by a range of species and we are able to locate them easily within the grassland because they are so obvious.

"One of the great advantages of using the roof tile as a survey tool is that normally grassland wildlife is small, inconspicuous, difficult to locate and occupies cracks and crevices that are extremely difficult to survey.

"The roof tile has changed all that and now we are able to monitor efficiently the local population of the Little Whip Snake as a way of finding out how we need to manage its habitats at Turallo.

"So far we have established that the reserve contains a healthy population of Little Whip Snakes as well as a number of other more common reptiles such as the three-toed skink," Dr Oliver said.

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# UNDERSTANDING THE BEAK-FACED GECKO: USING 21ST CENTURY METHODS TO SOLVE A 19TH CENTURY PUZZLE

ACTHA's April 2009 talk was given by  
Mitzy Pepper, School of Botany and Zoology, ANU.

This article by Mandy Conway

Mitzy has always been interested in herps, however she studied rocks and landscape ecology in far north-western Australia before her interest moved to biology and genetics at the Phd level.

Mitzy started her presentation outlining the importance of taxonomy, which refers to the classification and description of organisms and is the basis to specimen identification.



## CLASSIFICATION EFFORTS 150 YEARS AGO

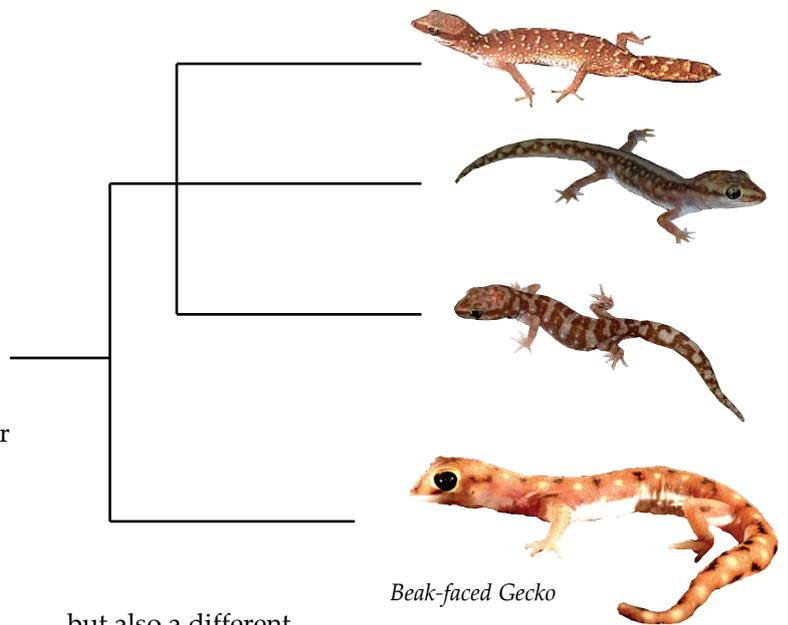
Albert CLG Gunther was a German born zoologist (3 October 1830 - 1 February 1914). He replaced a Mr John Grey as the keeper of zoology at the Natural History Museum of Michigan in 1867, describing reptiles from India, Africa and Australia.

Whilst studying Australian geckos he found who looked quite similar and so put them in Genus, *Diplodactylus*. He then found a gecko w was of a similar size and lived in the same ha but with very different scales, especially the c the front which looked like a beak. He put th gecko into its own Species called *Rhynchoedura*. Its distribution occurs across all of the arid zone of Australia, it is a termite specialist and lives down spider holes and burrows.

Fast forward 100 years to a gent called **Arnold G Kluge** who was fond of reptiles. He finished his PhD on reptiles in the 1950's and went on to get a job at the Michigan Museum of Zoology.

Kluge was placing his reptiles into species gr because they looked like one another and ha same evolutionary history.

Now, the Beak-faced gecko is related to others but not as closely related as they are to one another. It not only has a big scale at the front of its snout which looks like a beak



Beak-faced Gecko

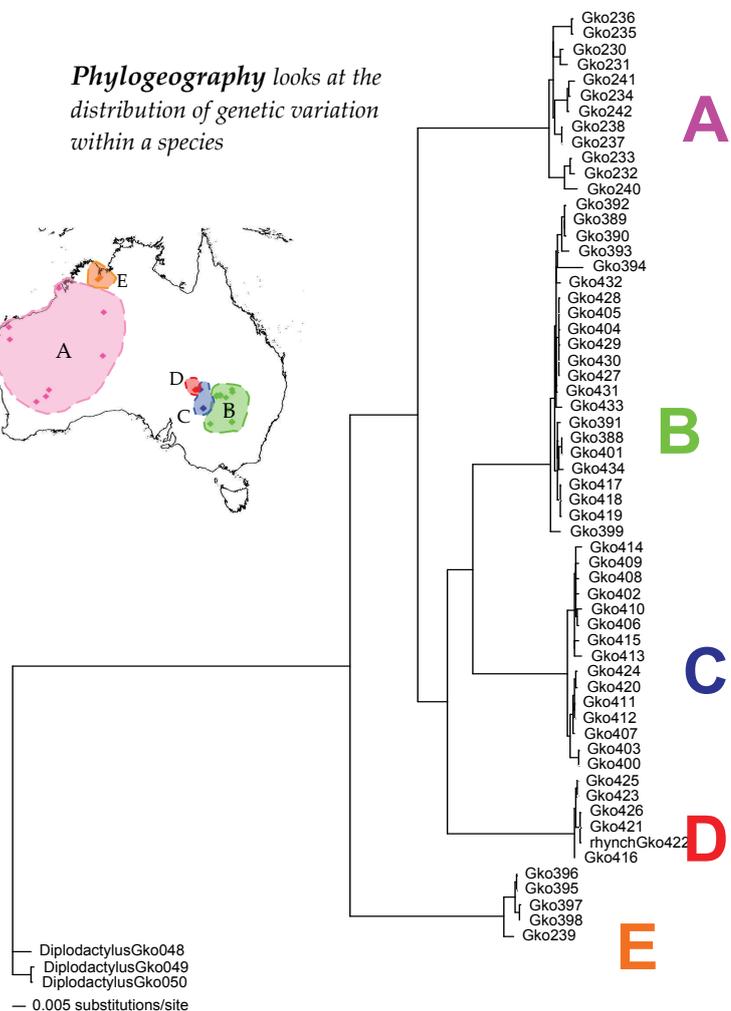
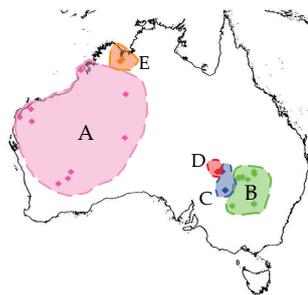
but also a different arrangement of femoral pores (scent glands on the inside of the thighs).

## CLASSIFICATION TODAY

Mitzy is doing her PhD on Australian geckos, specifically how they have evolved in the arid zone, looking at the way landscape has shaped their evolution, why there are so many and whether the evolutionary landscape shift from tropical to arid habitats has affected Genuses.

Mitzy is looking at the same group of geckos previously mentioned, in a molecular age where

*Phylogeography* looks at the distribution of genetic variation within a species



arrangement of how they relate to each other.” Mitzy is particularly examining genetic variations within and between different species. Was Kluge right 40 years ago, is the Beak-faced Gecko genetically unique?

**BACK TO THE ORIGINAL SPECIMENS**

Visits back to the museum were necessary to take morphological measurements of the specimens to see if this could tell them apart. A standard set of traits or characters are examined, which are relatively similar in a group. You need to measure at least 15 males and 15 females of each species to really gauge true species description. Specimens have a tag which will refer you to a database which in turn tells you where they were from, who collected them etc and then you start measuring them. (Geckos have tiny beady scales unlike most lizards which makes counting them very difficult, Mitzy laments!)

Clade E (see Chart on previous page), containing geckos with a distribution in the Kimberly, far north-western Australia, have a unique back pattern (small not large spots), have 6 femoral pores instead of 2, are discreet geographically, and genetically distinct in not one but five genes. This is all leading to the description of a new species.

**A SLEUTHING EXERCISE**

Looking in the Sydney museum Mitzy found one animal with a fatter than usual nose and thigh pores which looked different. Surprisingly the specimen was from Blackall, near Longreach in QLD.

Mitzy travelled up to try and find more of these geckos. Her team hunted every night along roads and spent a long time keying things out.

They found some cool lizards including *Tympanocryptis* which looked like a pebble on the road. *Egernia depressa* a spiny skink, and the Pygmy Spiny-tailed Goanna were also observed.

Lots of *Heteronotia binoei* (right) were about, a gecko which is one of the only reptiles in Australia with a population of all females.

“We even saw heaps of frogs, in



the middle of the desert?!”

“Sadly we didn't find any beak-faced Geckos in over 2 weeks of searching so we canoed down a gorge to make ourselves feel better.”

Feeling most despondent, with a few hours to go before coming home, Mitzy dropped into the QLD Museum and looked through a jar of *Rhynchoedura*. Bingo, the second last one in a jar of 50 was another of the beasts. Its origin was Mariala National Park, QLD.

Upon her return to Canberra, Mitzy wrote fervent letters to about 12 parks and wildlife people in the QLD areas asking them to keep any eye out for the geckos. In the last month she has received 4 specimens and they have been sent to the QLD Museum to be catalogued. Another two have been received as well, surfacing after heavy rain.

The geckos haven't been sequenced yet, so we await the next installment...

See also the presentation by Mitzy on 'Geckos in the Pilbara', ACTHA Newsletter Apr - May 2008

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## **BOY OR GIRL? IN LIZARDS, EGG SIZE MATTERS**

*ScienceDaily* (June 4, 2009) Adapted from materials provided by [Cell Press](#), via [EurekAlert!](#), a service of AAAS

Whether baby lizards will turn out to be male or female is a more complicated question than scientists would have ever guessed, according to a new report published online on June 4th in *Current Biology*. The study shows that for at least one lizard species, egg size matters.

We were astonished," said Richard Shine of the University of Sydney. "Our studies on small alpine lizards have revealed another influence on lizard sex: the size of the egg. Big eggs tend to give girls, and small eggs tend to give boys. And if you remove some of the yolk just after the egg is laid, it's likely to switch to being a boy, even if it has female sex chromosomes; and if you inject a bit of extra yolk, the egg will produce a girl, even if it has male sex chromosomes."

In many animals, the sex of offspring depends on specialized sex chromosomes. In mammals and many reptiles, for instance, males carry one X and one Y chromosome, while females have a pair of X chromosomes. In contrast, animals such as alligators depend on environmental cues like temperature to set the sex of future generations.

The new findings add to evidence that when it comes to genetic versus environmental factors influencing sex determination, it doesn't have to be an either/or proposition. In fact, Shine and his colleagues earlier found in hatchlings of the alpine-dwelling *Bassiana duperreyi* that extreme nest temperatures can override the genetically determined sex, in some cases producing XX boys and XY girls. His group had also noticed something else: large lizard eggs were more likely to produce daughters and small eggs to produce sons.

Despite the correlation, Shine said he had assumed that the association was indirect. In fact, his colleague Rajkumar Radder conducted studies in which he removed some yolk from larger eggs, more likely to produce daughters, to confirm that assumption.

"We were confident that there would be no effect on hatchling sex whatsoever," Shine said. "When those baby boy lizards started hatching out, we were gob-smacked."

Shine thinks there will be much more to discover when it comes to lizard sex determination.

"I suspect that the ecology of a species will determine how it makes boys versus girls, and that our yolk-allocation effect is just the tip of a very large iceberg," he said.

The authors include Rajkumar S. Radder, University of Sydney, Australia; David A. Pike, University of Sydney, Australia; Alexander E. Quinn, University of Canberra, Australia; and Richard Shine, University of Sydney, Australia.

**A NOTE FROM THE EDITOR**

*The views expressed by contributors and authors and any links to Websites provided in this Newsletter are not necessarily those of ACTHA.*

**PLATES OF FROG ILLUSTRATIONS FROM THE UPCOMING 'FIELD GUIDE TO FROGS OF AUSTRALIA' AVAILABLE FOR PURCHASE**

A 'Field Guide to the Frogs of Australia', text by Michael Tyler, illustrations by Frank Knight, published jointly by Steve Parrish & CSIRO Publishing, will be published mid-June.

The 72 plates by Frank Knight are in a similar format to those of his two previous Guides to Australian Birds and Mammals.

Previous Frog Guides have used photographs but the new Guide uses gouache paintings so as best to compare frogs between and within species. The plates are A3 in size on rag paper that resists deterioration. Each plate has between four and ten images, depending on the frogs depicted.

Anyone interested in purchasing plates may contact Frank at [fknight8@hotmail.com](mailto:fknight8@hotmail.com) or alternatively his 'sales manager' Andrew Isles at [books@AndrewIsles.com](mailto:books@AndrewIsles.com). This can probably best be done when checking out copies of the Guide when it appears and requesting particular plates via their page numbers, although earlier expressions of interest would also be welcome.

Andrew Isles is organising the pricing of individual plates, but these will be broadly in line with those which were previously set for the Mammal and Bird plates. He should be the contact when actual purchasing has been decided on.



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