



ACTHA contact details
PO Box 160
Jamison ACT 2614
E-mail: info@actha.org.au
Website: www.actha.org.au

ACTHA Inc. News DEC '14 - JAN '15

*Newsletter of the
ACT Herpetological
Association Inc.*

Your Committee for 2013 - 2014

| | |
|-------------------------|--|
| President | Dennis Dyer |
| Vice President | Ric Longmore |
| Secretary | Vacant |
| Treasurer | Margaret Ning |
| Newsletter Editor | Mandy Conway |
| Webmaster | Angus Kennedy |
| Public Officer | John Wombey * |
| Excursion Officer | Ric Longmore * |
| Conservation Officer | Joe McAuliffe |
| Committee Members | Iris Carter Greg Flowers Peter Child |
| Student Representatives | Vacant |

** Denotes Life Members*

Annual General Meeting

Notice is hereby given of the 2014 Annual General Meeting of the ACT Herpetological Association Inc, to be held at the Reptile Zoo, Nicholls, in conjunction with our Christmas party, Tuesday, 16 December '14 at 7pm.
All members welcome!

Agenda

Present, Apologies, Minutes of the Previous Annual General Meeting,
President's Report, Treasurer's Report, Election of Office Bearers
Other Business

In this issue

The evolution & convergence of eco-morphology in pythons, boas and their relatives: Damien Esquerre, ANU, was our guest speaker at the October Meeting and his presentation will appear in our next edition, but here's a taste! p3.

The Australian & International Scene:

Turtles disappearing from Murray-Darling river system as foxes destroy nests p4.

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ID Queries from ACTHA's Website, from p8.

SNAKES ALIVE!

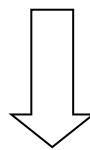
CARING FOR OUR THREATENED
NATIVE REPTILES & FISHES

Page 2

Upcoming meeting

Tuesday, 16 December 2014

Note – Change of venue



Christmas party for ACTHA members

from 6pm, Tuesday 16th December 2014

to be held at **Canberra Reptile Zoo,**
O'Hanlon Place, Gold Creek, Nicholls.

A selection of food & drink will be available for all financial members
(Margaret will have her receipt book for *last minute subscriptions, still only \$10pa*)

RSVP to mandyconwy@gmail.com by Sunday, 14 December 2014

SNAKES ALIVE!

CARING FOR OUR THREATENED NATIVE REPTILES & FISHES

Live displays and feedings of snakes, lizards, frogs, turtles, crocodiles and for the first time local threatened fish.



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10am - 4pm weekdays
10am - 6pm sat & sun



12 - 18 January 2015



Feeding Times - 11am & 2pm daily



Crosbie Morrison Building
Australian National Botanic Gardens



Adults \$6
Children \$3
Concession \$5

Threatened Fishes

For the first time see some of the ACT Regions rarest and most threatened aquatic species such as the Two-spined Blackfish and Murray Crayfish.

Presenter



Partners



Reptiles Inc.



The evolution and convergence of ecomorphology in pythons, boas and their relatives

The following is largely based on Damien Esquerre's comprehensive notes and has been presented here by Mandy Conway

The guest speaker at ACTHA's 21 October '14 meeting was Damien Esquerre, Keogh Lab, The Australian National University. Damien gave an extensive overview of his work on the above subject and presented it in his own passionate way.

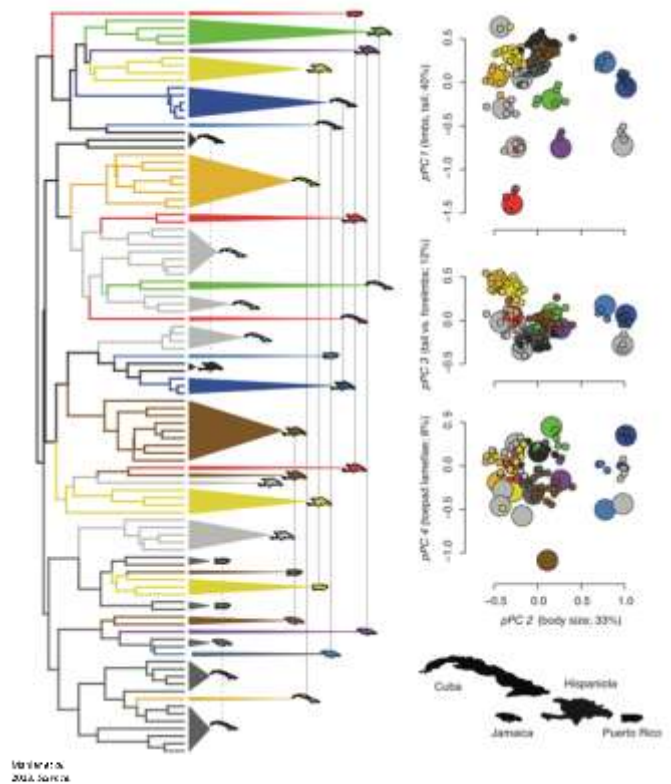
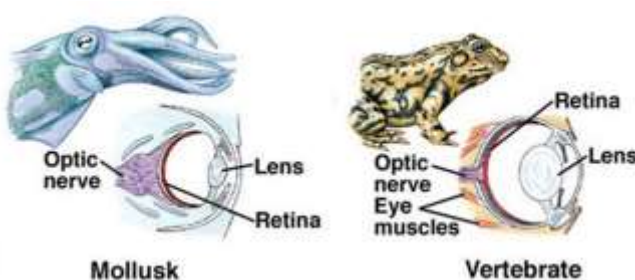
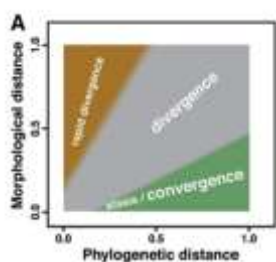
Damien started his presentation by stating "Ecomorphology is the study of the relationship between the ecological attributes of an organism and its morphology. This has been central in evolutionary biology since Darwin." His first slide illustrated the forelimb of different



mammals which have adapted to suit different environments. "Natural selection has acted on the limb morphology of mammals and created this remarkable diversity of 'tools' perfectly adapted to

their way of life, be it swimming in the ocean, galloping the savannas, swinging in the trees or flying through the skies."

"Convergent evolution is defined as the independent evolution of similar traits or phenotypes. It gives evolution, a rather unpredictable phenomenon, some kind of predictability. Certain traits evolve again and again under similar conditions. One of the most impressive cases is the independent evolution of the complex camera eye in cephalopods and vertebrates. Convergence can drive distantly related species towards the same adaptive optima. This can be sometimes driven by engineering constraints. For example, there is a limited number of ways, maybe even one, to construct a camera eye.



The image above shows what convergence looks like in a phylogenetic tree. This tree depicts the evolutionary relationships of the anoles. Each color represents an adaptive optimum, or phenotype. The same coloured phenotypes are convergent and arose independently.

The better known case of convergence, which is quite extraordinary, is the one between green tree pythons and emerald tree boas. They not only look extremely alike and live in the rainforest canopy, they also perch in the same peculiar way, and they also have the same brightly coloured red and yellow. This is a case of extreme convergence! I also want to know if there is a convergence in shape and is convergence more wide spread across other ecomorphs like aquatic or terrestrial species.



Ed. The full presentation of Damien's talk will appear in our next Edition.

Turtles disappearing from Murray-Darling river system as foxes destroy nests

A zoology expert says Australia's freshwater turtle population in the Murray-Darling river system is in crises and has almost disappeared in parts
ABC News, November 2014



Above: Due to foxes, hatchlings of freshwater turtles are becoming rarer.

Dr Ricky Spencer, a senior biology lecturer at the University of Western Sydney, said foxes were destroying most of the turtle nests as they sought food.

"There's a multitude of issues. Foxes are probably one that spans say the whole river and most of the country. River conditions, water conditions, those sorts of things are probably impacting them, particularly the adult population that might be dying off," he said.

"Foxes are destroying about 95 per cent of nests each and every year."

A phone app is now available so the public can help monitor what is left of the freshwater turtle population.

Dr Spencer said November was the peak time for turtle nesting and he was keen to enlist people's support to record the turtles they spotted along the river system.

"People can download TurtleSAT and record, become citizen scientists, do community mapping and actually record where they see turtles," he said.

"This is the time of year where turtles come out and nest, particularly on the Murray, but [after] the next rain storm I can guarantee that people will start seeing them crossing the road."

The mapping information will help researchers develop their conservation strategies

Sea Snake Harvest in the Gulf of Thailand

Wiley Online Library, Society for Conservation Biology, Article first published online, 11 Nov '14

Abstract

Conservation of sea snakes is virtually non-existent in Asia, and its role in human–snake interactions in terms of catch, trade, and snakebites as an occupational hazard is mostly unexplored.

We collected data on sea snake landings from the Gulf of Thailand, a hotspot for sea snake harvest by squid fishers operating out of the ports of Song Doc and Khanh Hoi, Ca Mau Province, Vietnam. The data were collected during documentation of the steps of the trading process and through interviews with participants in the trade. Squid vessels return to ports once per lunar synodic cycle and fishers sell snakes to merchants who sort, package, and ship the snakes to various destinations in Vietnam and China for human consumption and as a source of traditional remedies. Annually, 82 t, roughly equal to 225,500 individuals, of live sea snakes are brought to ports. To our knowledge, this rate of harvest constitutes one of the largest venomous snake and marine reptile harvest activities in the world today.

Lapemis curtus and *Hydrophis cyanocinctus* constituted about 85% of the snake biomass, and *Acalyptophis peronii*, *Aipysurus eydouxi*, *Hydrophis atriceps*, *H. belcheri*, *H. lamberti*, and *H. ornatus* made up the remainder. Our results establish a quantitative baseline for characteristics of catch, trade, and uses of sea snakes. Other key observations include the timing of the trade to the lunar cycle, a decline of sea snakes harvested over the study period (approximately 30% decline in mass over 4 years), and the treatment of sea snake bites with rhinoceros horn. Emerging markets in Southeast Asia drive the harvest of venomous sea snakes in the Gulf of Thailand and sea snake bites present a potentially lethal occupational hazard. We call for implementation of monitoring programs to further address the conservation implications of this large-scale marine reptile exploitation.

Brown Snake antivenom evidence questioned

Anna Salleh, ABC Science, 12 November '14



Above: Antivenom is regarded as a magic bullet against bites from snakes like this – but how much do we really know? Flagstaff photos.

We need better evidence to weigh up the benefits and risks of using antivenom against bites from certain snakes, including the common Australian brown snake, argue some experts.

While they don't recommend we stop using antivenom for these snakes, the two clinical toxicologists argue there is little high-quality evidence that antivenom prevents blood clotting problems caused by the snakes' venom. The experts lay out their case in a recent issue of *PLoS Neglected Tropical Diseases*.

"This review article is not about changing clinical practice anywhere. It's a call for better evidence," says lead author, Dr Geoff Isbister of the University of Newcastle.

Snakebite is the single most important cause of human injury from venomous animals worldwide.

The venom of some snakes contains toxins that bind to human clotting factors causing a condition known as venom-induced consumption coagulopathy (VICC), which can lead to serious and life-threatening haemorrhage.

These snakes include Australian tiger snakes, taipans and most often, the common brown snake (*Pseudonaja* species).

"Seventy-five per cent of cases where antivenom is given in Australia is for coagulopathy and

that's because [bites from] brown snakes are the most common snake bites in Australia."

Because antivenoms are produced by injecting snake toxins into horses, they can cause allergic reactions in humans, says Isbister.

He says evidence he collected in a previous Australian study suggests this could occur in around 20 per cent of people, with 3 per cent suffering severe anaphylactic shock.

Isbister says such risks can be higher in some countries and a review of the evidence shows it is not possible to properly weigh benefits and risks of antivenom use without higher quality studies.

Evidence review

Isbister and PhD student Dr Kalana Maduwage carried out a global review of evidence on antivenom effectiveness for treating coagulopathy and found studies were largely limited to comparing antivenoms with other antivenoms, or with different treatments for coagulopathy.

"There are no randomised controlled trials that compare antivenom to placebo for VICC," says Isbister.

He says antivenom was introduced to Australia in the 1940s and 1950s before the advent of regulations requiring this level of evidence for new therapeutic drugs.

"The problem with antivenom is because it's regarded as a magic bullet it must work."

The most convincing evidence in support of antivenom for coagulopathy, says Isbister, is a study from Africa that looked at treatment for bite by the African vipers. The study compared what happened at different times -- some when the antivenom was available and others when it was not.

On the other hand, says Isbister, a study that he co-authored found that antivenom was not effective at reducing recovery time from coagulopathy from Australian snake bites.

While there is no doubt from laboratory studies that antivenom binds to the venom toxins that disrupt the human clotting system, Isbister says the question is whether this benefits patients in the real world.

Isbister says after the toxins destroy a person's clotting factors, the liver must make new

clotting factors. This process can take 24-48 hours, during which time no administration of antivenom will be of any help.

He says the length of time a person is in hospital [and being administered antivenom] for brown snake bite is 24-36 hours and after this time the toxins appear to be no longer active.

In the case of the African viper, however, the toxins appear to continue to be active for longer -- a week or two weeks, says Isbister. When patients bitten by this snake are given antivenom, their recovery time is reduced to a similar time to those bitten by the Australian brown snake, he says.

Isbister says the discrepancy between the findings in Africa and Australia could point to the fact that antivenom may be useful for treating coagulopathy from some snake bites but not others.

Weighing risk and benefit

While Isbister believes there is low level evidence that antivenom prevents paralysis and muscle damage from Australian tiger snakes and taipans, he says randomised controlled trials are needed to show this, and to show whether they do in fact help deal specifically with coagulopathy.

He says this would then help clinicians weigh up the risks and benefits of using the antivenom.

There are some areas in Australia where taipans and tiger snakes don't occur so any coagulopathy, detected in a patient would be due to brown snake, says Isbister.

If randomised controlled trials showed that antivenom didn't stop coagulopathy, but did stop paralysis and muscle damage, then in areas where more than one type of snake occurs, he says antivenom would need to be given anyway to protect against paralysis and muscle damage.

Isbister says his questioning of antivenom use has raised the ire of many experts in Australia

He acknowledges there are challenges in carrying out randomised controlled trials.

"Ethically, it's very difficult to do a placebo-controlled randomised controlled trial," Isbister says.

But, he says, a recent research into red-back spider antivenom demonstrates it is possible to obtain approval for placebo-controlled studies on established clinical practices.

Comment from CSL

CSL, which manufactures antivenom under contract to the Commonwealth Government on a non-commercial basis, says antivenoms are critical to the treatment of systemic envenomation.

"The decision to administer antivenom to a patient is a clinical decision made by the treating physician, based on risk/benefit assessment that includes the severity of envenomation and risk of fatality," it said in a statement.

"Case series or prospective observational studies are the main stay of evidence available to support the safety and efficacy of antivenoms.

"It is not surprising that there are few placebo-controlled studies given the ethical issues associated with studies."

And speaking of Brown Snakes...

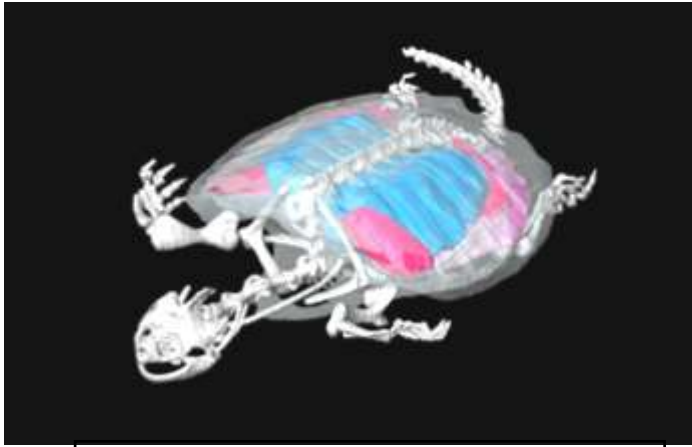
Take a good look at the picture below, what type of snake do you see?



If you answered Eastern Brown you would be correct! Did you know you cannot identify a snake by its colour alone? And ALL of these snakes are the highly venomous Eastern Brown Snake!

Origin of the unique ventilator apparatus of turtles: How their ribs got embedded in their shell

ScienceDaily, University of the Witwatersand,
7 November '14



Above: A Computed Tomography rendering of a snapping turtle (*Chelydra serpentina*) showing the skeleton (white), lungs (blue), and abdominal muscles (red and pink) used to ventilate the lungs. Because turtles have locked their ribs up into the iconic turtle shell, they can no longer use their ribs to breathe as in most other animals and instead have developed a unique abdominal muscle based system. Credit: Emma R. Schachner. Ed: check out our website to view this image in full colour!

Through the careful study of modern and early fossil tortoise, researchers now have a better understanding of how tortoises breathe and the evolutionary processes that helped shape their unique breathing apparatus and tortoise shell. The findings published in a paper, titled: Origin of the unique ventilatory apparatus of turtles, in the scientific journal, *Nature Communications*, on Friday, 7 November 2014, help determine when and how the unique breathing apparatus of tortoises evolved.

Lead author Dr Tyler Lyson of Wits University's Evolutionary Studies Institute, the Smithsonian Institution and the Denver Museum of Nature and Science said: "Tortoises have a bizarre body plan and one of the more puzzling aspects to this body plan is the fact that tortoises have

locked their ribs up into the iconic tortoise shell. No other animal does this and the likely reason is that ribs play such an important role in breathing in most animals including mammals, birds, crocodilians, and lizards."

Instead tortoises have developed a unique abdominal muscular sling that wraps around their lungs and organs to help them breathe. When and how this mechanism evolved has been unknown.

"It seemed pretty clear that the tortoise shell and breathing mechanism evolved in tandem, but which happened first? It's a bit of the chicken or the egg causality dilemma," Lyson said. By studying the anatomy and thin sections (also known as histology), Lyson and his colleagues have shown that the modern tortoise breathing apparatus was already in place in the earliest fossil tortoise, an animal known as *Eunotosaurus africanus*.

This animal lived in South Africa 260 million years ago and shares many unique features with modern day tortoises, but lacked a shell. A recognisable tortoise shell does not appear for another 50 million years.

Lyson said *Eunotosaurus* bridges the morphological gap between the early reptile body plan and the highly modified body plan of living tortoises, making it the Archaeopteryx of turtles.

"Named in 1892, *Eunotosaurus* is one of the earliest tortoise ancestors and is known from early rocks near Beaufort West," said Professor Bruce Rubidge, Director of the Evolutionary Studies Institute at Wits University and co-author of the paper.

"There are some 50 specimen of *Eunotosaurus*. The rocks of the Karoo are remarkable in the diversity of fossils of early tortoises they have produced. The fact that we find *Eunotosaurus* at the base of the Karoo succession strongly suggest that there are more ancestral forms of tortoises still to be discovered in the Karoo," Rubidge added.

The study suggests that early in the evolution of the tortoise body plan a gradual increase in body wall rigidity produced a division of function between the ribs and abdominal respiratory muscles. As the ribs broadened and

(The Australian & International Scene, cont'd...)

stiffened the torso, they became less effective for breathing which caused the abdominal muscles to become specialised for breathing, which in turn freed up the ribs to eventually -- approximately 50 million years later -- to become fully integrated into the characteristic tortoise shell.

Lyson and his colleagues now plan to investigate reasons why the ribs of early tortoises starting to broaden in the first place. "Broadened ribs are the first step in the general increase in body wall rigidity of early basal tortoises, which ultimately leads to both the evolution of the tortoise shell and this unique way of breathing. We plan to study this key aspect to get a better understanding why the ribs started to broaden."

ID QUERIES FROM ACTHA'S Website

Angus Kennedy, ACTHA's Web Master, keeps an eye on any reptile identification requests!

Hi, I am a founder of Questabird (www.questabird.com). Users submit sightings of birds and reptiles using our app; we have been receiving photographs of *skinks* that we are unable to identify. Is it possible to have one of your members help verify the odd submission we receive? I have attached a recent submission (below left) from Warwick, QLD. Can you pls help id this?

Regards, **Mallika**

ACTHA expert replies:

The only skinks of this appearance with a distribution that includes the Warwick area seem to be *Lampropholis* and based on the images supplied and the photograph on page 265 of Wilson and Swan I am reasonably certain it is *Lampropholis delicata*. The lateral black

and white lateral stripes occur on some populations on coastal NSW and the one on page 265 at Noosa River puts that colour variation at least in the general vicinity.



Spotted! Goanna Stake-out

Matthew Higgins writes:

"This week I've been up the Qbn River in the Galignite Crossing-Compo Canyon area photographing the beautiful and rare (officially listed as 'Vulnerable' in NSW) Rosenbergs Monitor. Some hours were spent getting a nice suite of images of this reptile." (below)



Subsequent related article from Tim the Yowie Man, The Canberra Times, 7 November '14

After considerable effort, Matthew Higgins of Ainslie, recently captured a photograph of one of our region's rarest goannas.

Having spotted a Rosenberg's monitor (*Varanus rosenbergi*) last year on Mount Ainslie, but unable to take a photo of it, when Matthew caught a glimpse of another specimen during a recent bushwalk in the rugged gorges upstream of Googong Dam, he was determined to get a photo.

Matthew reports that he "visited the area on two days, spending two hours with the reptile the first day and about one-and-a-half hours the next - waiting for Rosie to come out of its rocky lair."

Thankfully, the 1.5 metre long monitor finally obliged, and Matthew snapped away. "They are very beautiful and impressive animals," explains Matthew, who adds, "this one displayed nicely that marvellous reptilian tongue-flicking behaviour too".

(The Australian & International Scene, cont'd...)

Did You Know? Apart from the Rosenberg's monitor, the other monitor (goanna) found in and around the ACT is the Lace Monitor (*Varanus varius*). "Canberrans will be more familiar with lace monitors from encountering them at the south coast [especially around camping areas] where they are more numerous," explains Matthew, who adds, "as for Rosenberg's they are a bit more common around the Googong area than close to Canberra but are officially listed as 'vulnerable' in NSW."

Jill from 'Moorilla' Wallaroo, NSW, Writes:
"Sunday, 26 Oct '14, I walked out the door to empty coffee grounds on a pot around midday and spotted a large Brown Snake in a great knot on the verandah. It was making a meal of one of our Cunningham Skinks (for years we called them blue-tongues before the plumber put us right). Ralph was inside working on our tax returns and was pretty intrigued. He went out to take a photo but found a disgorged skink and an aggressive brown. When I looked again the brown was wrestling with a real blue tongue."



This time Ralph took a photo though the window. As he was doing so a larger Cunningham Skink arrived, watching the snake and draping itself over the smaller skink. The brown managed to swallow the blue tongue and as it moved off into the grass the bigger skink rushed at it nipping its tail. Of course the snake retaliated, quick as a flash, and it was on for young and old but the skink got away. I can't say if it survived.

So Sunday we had a dead skink on the verandah and are minus a blue-tongue. The bigger skink hovered near the dead one until the ants moved in and I haven't seen it since.

From Julian Robinson - flickr, mid November

"Here's the flower-munching Shingleback.... Campbell Park. It happily munched its way slowly around the meadow as we watched for sometime, eating only flowers - no grass and no insects...."



Sheridan Roberts took these photos of a Rosenberg's Monitor crossing Dicks Creek Rd, Murrumbateman just near her front gate. It was ushered across the road. "It seems to have taken up residence (again if it is the same one we saw last year) under our back shed."





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RSVP to margaretning1@gmail.com by Sunday, 14 December 2014

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So please come along to say hello, enjoy the occasion, and perhaps even let us know whether you can help us by volunteering at our *Snakes Alive!* Exhibition which is on From Monday 12th to Sunday 18th of January '15.
Geoff Robertson will do a short presentation on last year's *Snakes Alive!*



ACTHA News
PO Box 160
Jamison ACT 2614