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ACTHA NEWS
DEC 08 - JAN 09
Newsletter of the ACT Herpetological Association Inc.

IN THIS BUMPER ISSUE

ACTHA AGM - 21 October 2008

A summary of what happened at the meeting is on *page 2*. Your 2009 Committee Members are listed at right.

Turner Primary School Fete - 8 November 08

Yet another successful display of herps to inform the younger generation, *page 2*.

The critically endangered Fiji Crested Iguana

Suzanne Morrison, School of Botany & Zoology, ANU, studies iguanas. In Fiji. See from ***page 3*** for a glimpse of life on an island in Fiji and how people like Suzanne are trying to preserve the population of one of these stunning reptiles.

Late news! A new species of iguana has been found in the Fijian archipelago

Read all about how our very own **Danielle Edwards** and **Scott Keogh** (ANU), and team member **Peter Harlow** (Macquarie Uni), have discovered there are three species of *Brachylophus* not two as previously thought**, *page 8***. (*The timing with October's speaker is impeccable! Ed.)*

Rare geckos discovered

Two new geckos have been discovered: one in WA and the other in SA, *page 9*.

The International Scene

New genetic research has revealed that flatback turtles who dine on fish, shrimp, and mollusks, are closely related to primarily herbivorous green sea turtles, *page 10*.

What gecko species is that?

Geoff Robertson, ACTHA member, helps a fellow herpetologist out, *page 11*.

Tiger Snake observing opportunity

A member writes about their encounter with a Tiger Snake, *page 11*.

YOUR COMMITTEE

President	Joe McAuliffe
Vice President	Ric Longmore
Secretary	Angus Kennedy
Treasurer	Margaret Ning
Newsletter Editor	Mandy Conway
Public Officer	John Wombey
Excursion Officer	Ric Longmore
Committee Members	Christian Robertson
	Philip Robertson
	DennisDyer
Student Representative	Jake McAuliffe

DIARY DATE

The usual *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. **But...**

UPCOMING MEETING

CHRISTMAS PARTY

Tuesday, 16 December 2008.

Our Christmas party looks like it will be held in a cosy spot within the Australian National Botanic Gardens...

"Food, drinks and fine company!" our Secretary says.

It is imperative that you **RSVP** by **COB 12 December** to: margaretning@iprimus.com.au.

All attendees will be notified of final details so please RSVP ASAP!

ACTHA AGM 21 October 2008

Dennis Dyer, outgoing President, opened the meeting and gave many examples of why our Association, small as it is, continues to succeed in its prime objective. That is 'to educate the community about our reptiles'.

Exceptional speakers at our meetings throughout the year, small displays at local fetes etc, provision of grants to people doing research or forwarding advancement of our aims and, of course, *Snakes Alive!* which just about has a cult following these days.

The Association remains in a good financial position and has much to look forward to in the coming year.

All Committee Members, and indeed members, were thanked for their efforts over the year. *(The new Committee for 2009 is listed on the front page.)*

The Committee Members also expressed their sincere gratitude to **Dennis Dyer** for his efforts in ensuring ACTHA's survival at a time, many years ago, when things looked bleak. I don't think we'll ever be in that situation again somehow. So, thanks Dennis and don't think you can sit on your laurels now that you're no longer President!

Joe McAuliffe, as our new President, you have some big shoes to fill and we know you will do so reptilingly!

Angus Kennedy, our new Secretary, ditto!!

Ed.

TURNER PRIMARY SCHOOL FETE 8 NOVEMBER 2008

This article by Margaret Ning

Early on Saturday 8 November a dedicated group of eight ACTHA members turned up to Turner Primary School to affect a relatively speedy and efficient set-up, and to display some of our animals for four hours.

Everything went really well. The animals were well behaved, as were the children admiring them (though there were a few squeals from the adults!), and even the weather put its best foot forward!

Our room was superbly appropriate, and well set up, with eight enclosures and a tub containing around a dozen animals including pythons, dragons, blue tongues, and a turtle. Tables were placed in the right places and we were given a couple of display boards on which we hung our ever-increasing number of posters. The latter were well utilised and scrutinised throughout the course of the day. There was even a photographer who took photos over two 45 minute sessions as a further fund raising effort for the school.

It was a successful day with throughput of many hundreds, all at a steady rate with no bottlenecks. We were very well looked after by the school which helped us with all our requests and even fed us – the curries were excellent!

Many thanks to our members who helped out and to Turner school for inviting us to do our thing.

HELP – ATTENTION FROG OWNERS!!

We really have a bit of a gap when it comes to frogs at these small exhibits, ie we don't have any! and there were some disappointed youngsters as a result. Are there any members out there who would be able to lend us their frogs for future displays? Please contact me on margaretning@iprimus.com.au or 6241 405 if you can help with this, as any offers would be much appreciated.

Angus Kennedy, our new Secretary, with one of his favourite reptiles, the Bearded Dragon.

The Critically Endangered Fiji Crested Iguana

Suzanne Morrison
School of Botany and Zoology, ANU

This article by Mandy Conway

Suzie addressed ACTHA at its October 2008 meeting to talk about Fiji and the critically endangered Fiji Crested Iguana, *Brachylophus vitiensis.*

Suzie has spent many months in Fiji's surrounds and said it was a challenging place to work in, not all resorts and honeymoons as people might think.

She is in the middle of her Phd which involves detailed data collection on reproduction, diet and behaviour which will become a basis for the conservation and ecology of this iguana. Her project supervisors are Dr Scott Keogh (ANU) and Dr Peter Harlow (Taronga Zoo).

About Iguanas

Iguanas are large bodied animals and, unusually amongst lizards, the great majority are herbivorous.

There are 8 genera containing 40 species of iguana. Their distribution is interesting, living in Central America, South America, the Caribbean, the Galapagus and finally, throughout Fiji.

Iguanas in Fiji

The Fijian archipelago is comprised of two main islands and over 300 small islands. Among these:

- Yadua is a small island with 1 village on it and has no iguanas.
- Yadua Taba, a tiny island of 100 x 500 meters (or 70 hectares), has about 15000 iguanas on it, and 95% of the world's population of the crested iguana species.

Iguanas are believed to have lived here for tens of millions of years.

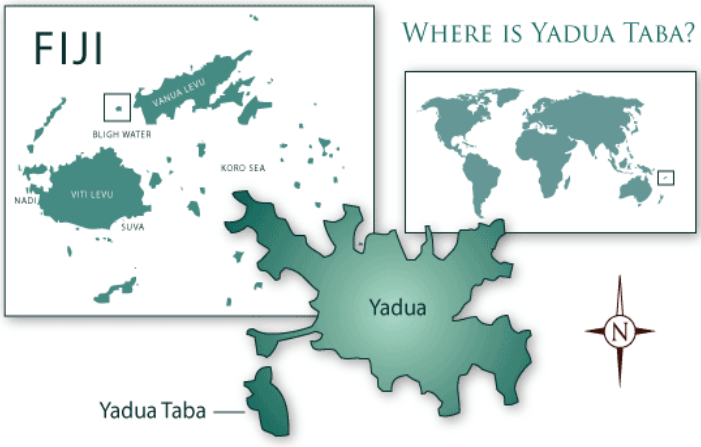
Brachylophus fasciatus, the **Fiji Banded Iguana** (*right)*, is the only genus which occurs in Fiji and was first described in the 1700's. It wasn't until 1980 that the **Fiji Crested Iguana** (*left)* was described as a separate species. 400 individuals were thought to exist on the island of Yadua Taba, which led to it becoming the first nature reserve in Fiji.

Throughout the 1990's and in early 2000 Peter Harlow conducted surveys on the western side of Fiji. Banded Iguanas were found in the east, Crested Iguanas were found on the drier western side.

On a second survey of the Islands, Peter found that the populations were rapidly declining. On some islands where he had found 20 individuals, the population had fallen to only 5. So the populations that were there were very few and scattered and were already quickly declining The only place where they were still in abundance was on the Yadua Taba Island on which they were first discovered

The source of threat to iguanas is much as anywhere else in the world: competition for food, especially as vegetarians; goats and the burning carried out to catch the goats which also destroys the habitat; introduced predators like cats and rats, and mongoose represent a challenge to these lizards.

Natural predators on the Island include the Fiji Goss Hawke and the Fiji Swamp Harrier. By looking through the bones at the Harrier feeding stations Suzie can determine age groups and sexes the Harriers are feeding on.



Yadua Taba Island

Experiencing Fiji at close hand

Little tinnies take Suzie and her provisions from the mainland across 20kms of open ocean to Yadua Taba, her study site. The only village becomes her home on the weekend, where 200 traditional villagers make her feel very welcome.

Subsistence living is the name of the game here, where residents make their own houses. Although there is some corrugated iron used in structures, most are built by traditional methods using cane grass and wood from the forest. Tops of houses are tree ferns imported from the mainland. The houses last 6-10 years unless a cyclone blows them away.

There is one school which the children will only leave to attend a high school on the mainland. "Everything here looks as it would have more than 100 years ago." Suzie commented.

The villagers, as custodians, protect the Island and are the only people allowed to reef-fish and collect coconuts. A Ranger, who does speak English, takes the main responsibility for the Island and his family is Suzie's host family whenever she is there.

Villagers' food comes from both the sea and land. The western side of the Fiji archipelago can see little or no rain for most of the year, which means sometimes even root crops can't be grown. This means buying it from the mainland which will cost the village $200 in fuel to get: a hard life a lot of the time.

Fish is a staple: women line fish and men use spears. Coconut is the other staple, so all food is called 'baka lolo' or 'with coconut'.

Money is also spent on flour to make sweet fried bread on the weekend, and on special occasions like weddings and funerals. Villagers do catch turtles for these feasts, which requires a permit, but this is not regulated. Suzie has seen Greenbacks and Hawksbills and has heard of Leatherbacks as well. Villagers harvest the turtles however leave the turtle eggs alone.

Kava roots from the pepper bush is a popular drink at welcomings, farewells and really any occasion at all. Actually, basically every night! Suzie never really acquired a taste for it but if you want to go to Fiji and want anything done then you have to drink Kava!

"Fiji is a very bright place with lots of dressing up." Suzie said.

Spectacular mats are made from Pandanas with beautiful designs.

Suzie spends Saturday and Sunday in the village, attending church on Sunday, and she didn't always escape the language barriers! She recounted some very humorous faux-pas including calling the chief "a very good but a very big pig" early on...she called a couple of beautifully dressed ladies "big grapefruit" instead of saying "they looked beautiful"... The most embarrassing one? Calling out to her family grandmother across the village and telling her she had "excellent pubic hair" instead of "excellent chickens". Suzie was confronted with much laughter and asked to repeat what she'd said (she didn't find out for some time her error).

The Island of Yadua Taba

Temperatures fluctuate between 25 and 32°C day and night. All fresh water needs to be carried onto the island and bathing is in the sea with a couple of cups of fresh water for rinsing.

Casuarina trees cover much of the Island. When the dry forest gets a downpour of rain a leaf flush occurs within a few days, which sets off the wet ecosystem. The native birds start breeding at this time.

15,000 water dragon sized Crested Iguanas live up in the trees. They have longer tails than our water dragons, for counterbalance. They are also well camouflaged and difficult to see during the day.

There are two species of fruit bats, lots of crabs such as hermit crabs, land crabs, and the 'Vicks Vapour Rub Crab', *(right).*

Insects are encountered at night when the torches are used. "You can hear the insects coming before they hit you on the head!" Suzie recalls.

Other critters include:

- a number of *Emoia trossula* species which are similar to our water skinks;
- the green tree skink *Emoia concolor (below);*

- lots of geckos including *Nactus pelagicus*, the Pacific Slender-toed Gecko *(below*).

These geckos have long digits which are distinctly clawed without enlarged pads;

- the Pacific Boa, *Candoia bibroni*, *(below)* averages 1.5m in length and villagers think these are poisonous (villagers also believe iguanas are poisonous);

Ed: *'A Field Guide to the Herpetofauna of Fiji' by Clare Morrison, Institute of Applied Sciences, The University of the South Pacific, Suva, Fiji, 2003, was an invaluable reference in writing this article.*

- the White-lipped Sea Krait, *Laticauda colubrina*, is highly venomous but non-aggressive and is found through the rocks and roots of coastal vegetation on occasion.

The 3 year study

Suzie starts her field work on a Monday after spending the weekend with her hosts. One or two field assistants sometimes accompany her. Three months at a time are spent at the field site so lots of gear is taken over on the little boats.

Approach is on the eastern side of Yadua Taba in high tide. But the area is very rocky and steep so the boats come around to the western side to land: more accessible and calmer. It is sheltered from the wind and has beautiful dry forest.

The mark and recapture study is carried out mainly at night with spotlights when the iguanas can be seen well. Long fishing poles with the tip replaced by a taped piece of wood is used to poke the iguana. It hopefully grabs the pole and is brought down. "Easier than it sounds…" Suzie said.

Each individual is weighed, measured and marked by inserting a pit tag (similar to a microchip in dogs) which goes in under the skin.

The iguanas change colour from green to black within 3 minutes when angry. They have small teeth and very long sharp claws so care is needed to minimise wounds (especially due to the lack of medical facilities in most tropical areas).

A set area is used for the marking and recapture study with a number of transacts across the island. Numbers of animals per area is worked out within habitat sectors. This currently gives an overall figure of 15,000 iguanas on the island!.

So…

Before Suzie began her study, the main research that had been conducted was on distribution. This identified that Crested Iguana populations were diminishing and that there was a problem.

Part of the management plan that arose from this knowledge was to conduct research to find out more about the ecology of the iguanas in the wild. This is the basis of Suzie's current work (being done in conjunction with separate research being carried out by Clare Morrison) looking at diet, movement, reproduction and threats to the population on Yadua Taba. This research will inform future translocation decisions.

What is known to date is that:

- iguanas mate in the wet season;
- females lay eggs in a nest at the end of the wet season (so in the beginning of the year) and do so every second year;
- the nest is a 15cm long hole in the ground;
- three eggs are laid in the wild compared to 6 in captivity, so their recruitment is very slow which will have implications for translocations;
- the eggs incubate in the ground for 9 months to transverse the dry season; and
- lots of fighting between males occur at breeding times!

A few questions to finish

Wider distribution?

Other Pacific islands are not like the old land forms of Fiji. They rise and fall over geological time. There are other examples of reptiles rafting as these creatures don't need to eat or drink for long periods so they just cling to floating vegetation, often resulting from cyclones.

Are all 3 species critically endangered?

The Fiji Crested Iguana is critically endangered, the Banded Iguana is endangered but not enough is known about *B. Bula bula* to say.

Has any work been done on the Tongan iguana?

Tongan iguanas, which are thought to have lived there for about 300 years, can be genetically traced to a distinct island in Fiji.

Although the islands of Fiji are very close together each island has its own genetically distinct population so movement can be identified.

Exclusive: A new discovery!

Suzie gave members details of a new species of iguana discovered by her fellow Australian researchers. See over the page….

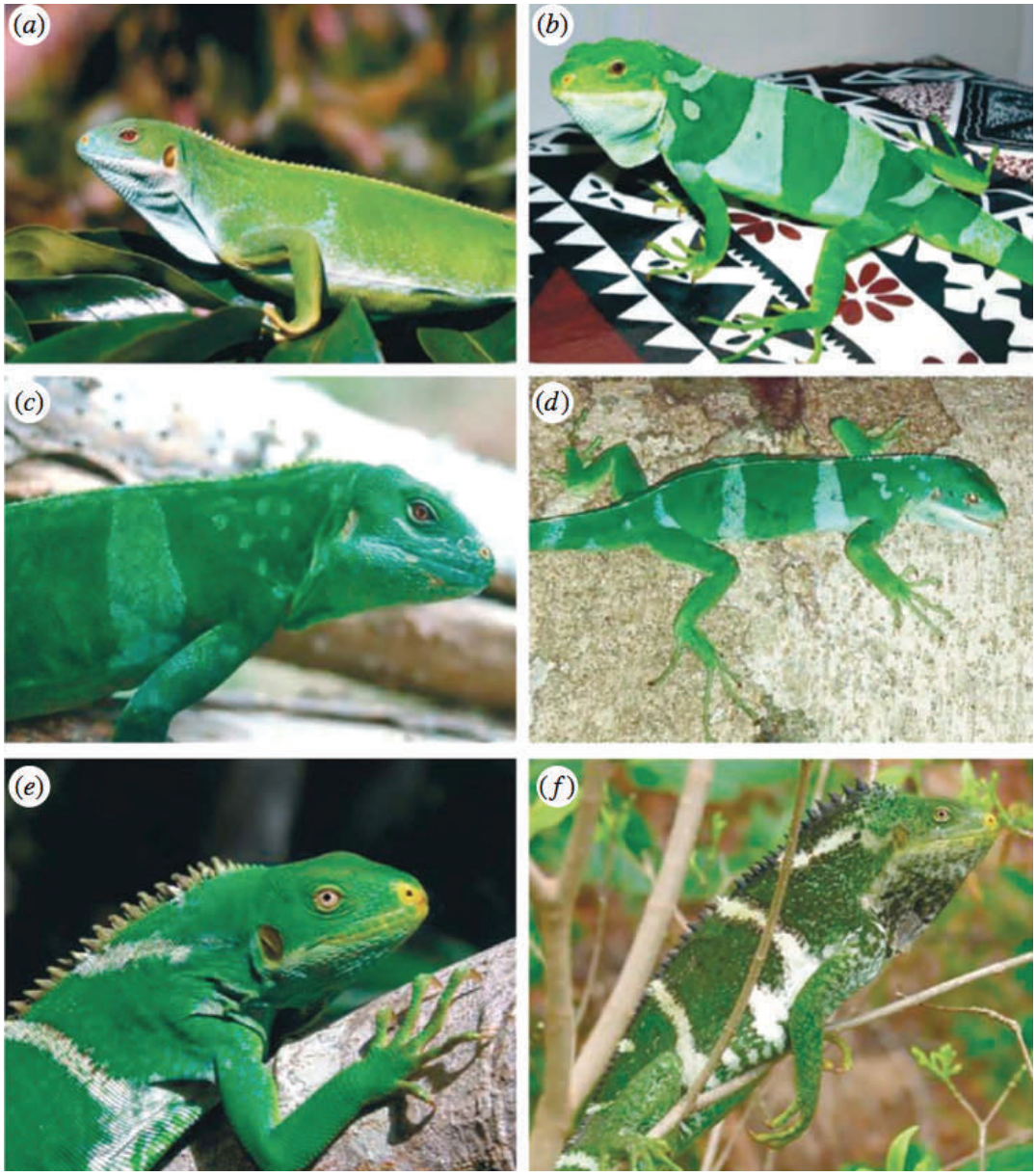


Figure 3. (*a*) Female *B. bulabula* sp. nov. from Kadavu Island, Fiji; photo by Peter Harlow. (*b*) Male *B. bulabula* sp. nov. from Kadavu Island, Fiji; photo by Paddy Ryan. Note the sexual dimorphism in colour pattern and diagnostic nuchal stripe, yellow nostril and red eye colour in *B. bulabula* sp. nov. (*c*) Male *B. fasciatus* from Eueiki Island, Tonga, representing the introduced populations that are type location (country) for *B. fasciatus*; photo by Harold Cogger. (*d*) Male *B. fasciatus* from Aiwa Levu Island, Fiji, representing the native populations of this species from the Lau Group Islands; photo by Greg Pregill. Note the diagnostic *B. fasciatus* features of nuchal spotting, reduced nostril coloration and golden eye colour. (*e*) Female *B. vitiensis* from Yadua Taba Island, Fiji. (*f*) Male *B. vitiensis* from Yadua Taba Island, Fiji. Both photos by Suzanne Morrison. *Brachylophus vitiensis* is highly variable in coloration and pattern. Note the prominent crest that is both larger and darker than *B. bulabula* or *B. fasciatus*, lack of colour pattern dimorphism, the nuchal stripe that it shares with *B. bulabula* and the increased yellow nasal coloration and golden eye colour.

Late breaking news!
A new species of iguana has been found in the Fijian archipelago

Source: Paddy Ryan, Philosophical Transactions of the Royal Society B. Sept 2008

A new paper has been released as a result of genetic work carried out by Danielle Edwards and Scott Keogh, Australian National University and Peter Harlow, Macquarie University. The team shows there are three living species of *Brachylophus* iguanas, not two as indicated in current taxonomy.

The new species is named *Brachylophus bulabula* after the Fijian word for 'hello'.

"In the reptile world the Fijian iguanas are iconic," says lead author
Associate Professor Scott Keogh, of the
Australian National University's
School of Botany and Zoology.

"To discover a new species of them is very exciting."

But he says the new species and its cousins are under threat from habitat loss and attacks by feral cats and mongoose.

"Two species of the iguana are already extinct, having been eaten out of existence about 2800 years ago by the earliest arrivals on the islands", Keogh says.

He says of the surviving three species, the Fiji Crested Iguana, is listed as critically endangered and the other two as status unknown, due to lack of information about their numbers.

The new species was uncovered after analysis of the mitochondrial DNA of 61 iguanas from 13 islands.

The study shows the *B. bulabula* iguana is genetically and physically different from the two other species.

It has a different coloured nose, is intermediate in size, has a slightly different pattern on its body and is found only in the central region of Fiji.

As part of the research the team also evaluated competing arguments about how the iguana arrived in the Pacific.

He says the Pacific iguanas of the Fijian and Tongan archipelagos are a bio-geographic enigma because their closest relatives are found only in the Americas.

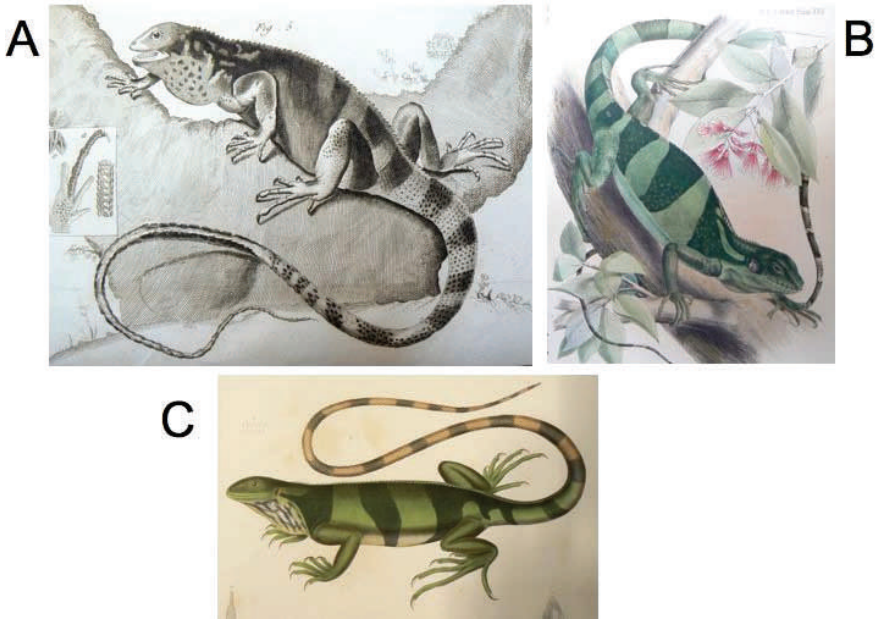
Keogh says the genetic analysis adds weight to the theory the iguanas "**floated on some kind of raft**" to the Fijian islands somewhere between 13 to 14 million years ago.

The competing argument suggests the animals came via Asia when Fiji was connected to Melanesia.

"The problem with that is it requires there to be relatives in Asia and there aren't." he says.

The analysis also shows that, with only one exception, every island for which there were samples was represented by at least one distinct iguana lineage.

Keogh says their work is particularly important in helping the Fijian Government find ways to protect the reptile.



These old prints show what were all previously thought to be B. fasciatus. A) male B. fasciatus and B&C) recently identified as male B. bulabula. Among other things fasciatus has more 'spotting' behind the head while bulabula has a more defined band (as does vitiensis).

Rare geckos discovered

Narelle Towie, Science reporter, 'Perth now'
(30 October 2008)
http://www.news.com.au/perthnow/story/0,21598,24576302-5017007,00.html

TWO new species of gecko have been discovered in the arid landscape of Western Australia's Northwest Cape and the deserts of South Australia

The rare new WA species looks just like its nearest relatives the stone gecko, but DNA evidence shows that it evolved from its relatives millions of years ago.

Geckos are famous for their ability to stick to vertical surfaces thanks to microscopic hairs on the pads of their feet.

The newly discovered **Cape Range Gecko** has been named *Diplodactylus capensis* meaning two finger pads because it has two pads on each toe instead of one.

WA Museum curator of herpetology
Dr Paul Doughty said the Cape Range Gecko had previously been confused with a similar-looking Pilbara species, but is more closely-related to the southern species.

"What is fascinating about this species is its evolution in isolation on the northwest Cape, far from its nearest relatives more than 600kms away.

"The Cape Range is made up of an ancient block of limestone which has created a unique habitat to which the species has adapted", said Dr Doughty.

The Cape Range Gecko only occurs on the Northwest Cape near Exmouth.

It is characterised by its distinctive broken stripe on its back, larger head and reddish colouration which matches the colour of the rocks on the Cape Range.

"Little is known of this new species and we are still in the process of describing other new species of reptiles from this special area of Western Australia.

Cape Range Gecko

"This region is better known for the Ningaloo Reef and its Whale Sharks, but we are finding unique and fascinating new species of lizards on this ancient land," said Dr Doughty.

The second species, the **Southern Sandplain Gecko**, *Lucasium bungabinna*, occurs in the southern deserts in Western Australia and South Australia, north of the Nullarbor Plain.

This species belongs to a group of ground-dwelling desert geckos that have mostly lost the sticky toe pads used by climbing geckos.

The new species is distinctive in that it still has small toe pads and still spends some of its time climbing low shrubs.

The scientific name 'bungabinna' is derived from the Bungalbin Sandplain in the west and the Yellabinna Sandplain in South Australia where it occurs.

Continuing work involving studies of both the physical appearance and the genetic diversity of Australia's geckos is revealing that there are yet more new species to be described.

The research on both species was carried out at the Western Australian Museum and South Australian Museum, and was funded by a grant from the Australia and Pacific Science Foundation.

The International Scene

Seafood eating Flatback turtles closely related to herbivorous Green Sea turtles

ScienceDaily (Oct. 21, 2008)

It's confirmed: Even though flatback turtles dine on fish, shrimp, and mollusks, they are closely related to primarily herbivorous green sea turtles. New genetic research carried out by Eugenia Naro-Maciel, a Marine Biodiversity Scientist at the Center for Biodiversity and Conservation at the American Museum of Natural History, and colleagues, clarifies our understanding of the evolutionary relationships among all seven sea turtle species.

Naro-Maciel and colleagues used five nuclear DNA markers and two mitochondrial markers to test the evolutionary relationships of all species of marine turtles—leatherback, flatback, green, hawksbill, loggerhead, Kemp's Ridley, and Olive Ridley—and four 'outgroups,' or more distantly related animals. The results formed a well-supported phylogenetic tree, or cladogram, that tells the story of sea turtle evolution and is reported in the journal *Molecular Phylogenetics and Evolution*.

"The evolution of a specialized diet appears to have occurred three times, independently," says Naro-Maciel. "Many sea turtles are carnivorous generalists. However, hawksbills tend to have a diet of grass—they eat toxic sponges—while the leatherback consumes jellyfish and the green grazes mainly on algae or sea grass." Each of the species with specialized diets is positioned uniquely in the evolutionary tree.

Naro-Maciel and colleagues confirmed that one major group of sea turtles includes sister species flatback and green turtles (one carnivorous and the other herbivorous), while another clade is formed by the hawksbill, loggerhead, Kemp's Ridley and Olive Ridley turtles. The leatherback is confirmed as the most basal of all the sea turtles, and the Eastern Pacific green turtle—thought by some to be a separate species—falls within the green turtle species. The branches of this evolutionary tree can be calibrated with time using the new phylogeny and DNA data: Even though the ancestor of all sea turtles arose over 100 million years ago, the separation between the flatback and green turtles happened about 34 million years ago.

Determining the evolutionary relationships among sea turtles as well as the species identity of different populations of this highly migratory group of animals has implications for conservation. All sea turtles are included on the IUCN's Red List of Threatened Species, some of them as critically endangered, and an accurate understanding of this highly migratory group is important.

"These research results are another example of the importance of using systematics and taxonomy as a way to prioritize conservation efforts and strategies," says George Amato, Director of the Sackler Institute for Comparative Genomics at the Museum and an author of the article. "Only with these detailed studies can we better conserve the naturally occurring evolutionary novelty and patterns of genetic diversity for endangered species."

Other authors of this article, funded in part by the Regina Bauer Frankenberg Foundation for Animal Welfare, are Minh Le (American Museum of Natural History) and **Nancy FitzSimmons (University of Canberra, 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.

What species is that?

Geoff Robertson, ACTHA

The following photo was sent to me from Friends of Grasslands member **Beth Stokes**, living a little west of Mittagong.

This beautiful creature is a **Thick-tailed or Barking Gecko**, *Underwoodisauris milii.* Apparently, the animal barks when threatened.

To identify it I looked up several authors, and found in each case the basis pattern of markings was the same. However, there was a wide range of colour and the frequency of dots on its back varied somewhat. The photo by Gerry Swan in the Swan, Shea and Sadlier book *A Field Guide to Reptiles of NSW (Second edition)* (p42) looks most like Beth's photo. Gerry's photo is labelled Sydney. The Wilson and Swan book *A Complete Guide to Reptiles* (ps 100-101) has a photo taken in Queensland - colour and dot pattern look somewhat different. Coggar's book *Reptiles & Amphibians of Australia (sixth ed)* (P275), photo taken in Hornsby, Sydney, also has a very different in colour.

The maps in the books suggest that the area west of Mittagong is outside, or on the margin of, the Barking Gecko's reported range.

Thick-tailed or Barking Gecko, *Underwoodisauris milii*

Ed. *Got a good photo of something you can't quite identify? Send it in for our Newsletter. I'm sure many of our members would be delighted to attempt to identify it.*

Tiger Snake in motion

Margaret Ning writes...

Late in October Geoff and I went with friends to Eden for a whale watching weekend. In addition to the animals in the ocean we were also treated to a couple of interesting sightings around the BBQ area in our caravan park.

We had an evening of viewing scampering rats (presumably a feral species) running up trees and around under the bushes, and, more excitingly, an hour or so one afternoon of watching a very active tiger snake moving around in the same bushes. Perhaps the snake was there because of the rats? This all occurred only a few metres away from us and Geoff managed to get a couple of photos, but not one with the whole snake in it unfortunately.

CHRISTMAS PARTY

Tuesday, 16 December 2008

Looks like it will be held in a cosy spot within the Australian National Botanic Gardens...

It is imperative that you **RSVP** by **COB 12 December** to: margaretning@iprimus.com.au.

All attendees will be notified of final details so please RSVP ASAP!

Having trouble? email Margaret or call Mandy on 6259 2224 (evenings)

ACTHA News
PO Box 160
Jamison ACT 2614