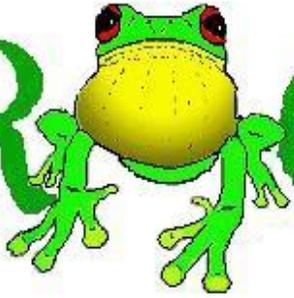


FROG CALL



THE FROG AND TADPOLE STUDY GROUP NSW Inc.

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NEWSLETTER No. 107 June 2010

NSW Frog licences must be sighted if you would like to adopt a frog.



Photo above by Jake Janos
Magnificent Tree Frog *Litoria splendida*

MEETING FORMAT Friday 4th June 2010

- 6.30 pm** Lots of lost frogs needing homes. Please bring your FATS membership card, \$\$ donation and NSW NPWS licence.
- 7.00 pm** Welcome and announcements.
- 7.45 pm** The speakers include:
Andrew Nelson, "Famous Frogs in History";
Grant Webster "Canadian Frogs" and
Sheila Brifa "Smiths Lake Field Trip".
- 8.30 pm** Field trip reports, show us your frog images, tell us about your frogging trips or experiences, guessing competition, light refreshments and a chance to chat with frog experts.

Arrive 6.30 pm for a 7 Pm start.

Friday 4th June 2010

**Meeting to be held at the
Field Studies Centre (Education
Centre)
Bicentennial Park**

Easy walk from Concord West railway station and straight down Victoria Ave.

Take a torch.

By car: Enter from Australia Ave at the Bicentennial Park entrance and drive through the park (one way road). Turn off to the right if entering from the main entrance. Or enter from

Bennelong Rd / Parkway. It's a short stretch of 2 way road and park in p10f car park (the last car park before the exit gate). See map page 12

CONTENTS

PAGE

- Main speakers last meeting:
Rowena Hamer, Scents of Danger and Arthur White, Cane Toads at Taren Point and *Litoria castanea*, and Judy Harrington Dorrigo and beyond field trip 2
- Growling Grass Frog 4
- Atrazine study
- Frogs, Zoologists and the French connection 6
- Tadpoles scream under water 8
- Papua New Guinea frog changes colour 9
- Unique Indian frog 10
- What's at the bottom of your garden 11
- FATS committee contacts
- Field trips, FATS Code of Conduct, meeting map and Frog-o-graphic competition 12



LAST FATS MEETING 9th APRIL 2010

Punia Jeffery, our FATS Chairperson and Judy Harrington from the Sydney Olympic Park Authority, welcomed members and visitors to our new home at the Field Studies Centre aka Education Centre, at Bicentennial Park, Homebush. The new venue is very comfortable and a huge improvement on our previous meeting hall, being warm in Winter and cool in Summer.



Our farewell night at heritage building 22 George Madani and Judy Harrington foreground Wendy Grimm outside. February 2010 Photo Phillip Grimm

The end of daylight saving had caught everyone by surprise. The roads leading to the Education Centre were unintentionally left unlit. Well done the sixty of you who found the Field Studies Centre in the dark! Apologies to those who got lost! If you are uncertain of the way there, then the Bennelong Road/Parkway entry may be the most direct route to use.

Arthur White announced the very popular and final FATS field trip for the season, to be held at Smiths Lake. See page 12, FrogCall newsletter 106.

The Frog and Reptile Show has moved to Sydney Olympic Park showground. Thank you to all those who assisted at the FATS stall, including Karen and Arthur White, Punia Jeffery, Marion Anstis, Phillip Grimm, Robert Wall, Grant Webster, Monica Wangmann and especially Lothar Voigt.

Our main speaker at the FATS meeting was Rowena Hamer from the University of NSW, presenting findings about scent communication between Great Barred Frogs *Mixophyes fasciolatus* – the coolest frog in the world, according to Rowena. The study looked at these adult frogs who are known to have low mobility, use of scent

communication and are targeted by red bellied black snakes. There has been little research into amphibian responses to odours from other frogs and behavioural responses to reduce predation risks.

Mating call signals made by frogs may be picked up by females, as well as competitors or predators. Scent signals are an alternative way to communicate but these odours can also be picked up by predators. Scent trails from frogs with low mobility may cause those amphibians to be more at risk from predation.

Forty two frogs were tracked over 176 nights over a two year period. Each frog was tracked from between one and nine nights. Distances travelled, distances from water, environmental conditions and microhabitats were studied. On 50% of the nights they didn't move at all, with up to seven nights in the same shelter. Females were found in isolation, further from water than males, possibly reducing predation risk and avoiding over amorous males (who harass females even if their eggs are not ready to be fertilized). If it's too cold, too dry or too hot they tend not to move.

Pheromones and skin secretions marked sites used by frogs. Those with high resting site fidelity may be vulnerable to predation. Using scent communication may be increasing predation risk and transference of bacterial and viral infections.

Scent strategy responses were studied in the lab. Given a choice of shelter, frogs were attracted to their own species scent when there was no predator odour present. When predator scents were added, the frogs appeared to avoid shelters with odours of their own species. Females were less interested in frog scents. Much more work needs to be done to determine how scent communication works and the affect feral predators have.

Many comments and questions from the floor followed. Thank you Rowena for a fascinating and thought provoking presentation.

Arthur White, talked about the alarming numbers of Cane Toads found in the Sutherland Shire in 2010. There is great concern about their breeding in Sydney and the susceptibility of local tree frogs, other small creatures, native predators and wetland birds.

Arthur has been employed by Sutherland Shire Council to prepare a plan of management and strategy for the toads' eradication. More information will follow in future FrogCalls.

By the 1960's Cane Toads had moved into Brisbane. Over successive years they have marched South and West, traversing the Northern Territory in a space of five years, which shows how fast these animals can move under ideal conditions. The first record of Cane Toads in Sydney was 1983 but they may have been here earlier than that. The first record in the Shire was 1986.

In 1998 FATS started its frog rescue service and commenced picking up Cane Toads as a result. There were a number of people at the April 2010 FATS

meeting who were involved with the successful Cane Toad eradication at Port Macquarie, in recent years.

In conjunction with NSW National Parks and Wildlife Service (NPWS), FATS started a Cane Toad Alert Programme. On average 50 toads are collected in Sydney a year with normally a couple from the Shire.

Over the February to April 2010 period most Cane Toads reported by local residents came from Taren Point. It was obvious by the size range of the toads collected that they have been breeding for at least three years. This year, excellent wet and warm weather conditions have escalated the numbers of Cane Toads breeding at Taren Point.

The impact of highly mobile, toxic, parasite ridden Cane Toads on native fauna, predators, cats and dogs could be significant. Recently the number of foxes reported in the Shire has dropped dramatically.

Experiments are under way to see if Cane Toads can be infected by parasites to reduce their numbers whilst not affecting other species, but trials show that Cane Toad parasites (not native to Australia) are potentially lethal to native Australian tree frogs.

How far have the toads dispersed in the Shire?

Overseas, these animals are known as the Marine Toad. They have a very high ability to withstand saline conditions. It is of concern that they may spread into the continuous coastal mangroves leading into Taren Point Nature Reserve, which is mostly wetland mangrove, home to internationally renowned water bird life. Small wetland birds are unlikely to survive if they commence eating baby Cane Toads. Sutherland's National Park is also under threat.

NSW NPWS and FATS will target known toad breeding sites. We will be calling on the resources of FATS members and sister societies, to stop all this, gearing up for a fairly large assault in Spring and Summer 2010. FATS is in the process of buying Cane Toad traps and solar strip path lights. The intention is to hammer known sites including some industrial land, before the next breeding season. Get your wellies and torches ready.

Arthur spoke about the subject of our proposed August 2010 presentation: the rediscovery of *Litoria castanea* the Yellow-spotted Bell Frog in the Southern Highlands.

It was thought to be extinct but it is back from the dead, rediscovered by NSW Fisheries Field Scientist, Luke Pearce See photo above.

<http://www.abc.net.au/news/stories/2010/03/04/2836418.htm?site=sydney> in late 2009. Dr Dave Hunter from NSW NPWS had been conducting a series of talks about threatened species. Luke had attended one of those presentations and called his colleague Dave... and from there they made headlines.

A recovery strategy is being prepared very quickly. Taronga zoo has successfully raised *Lt. castanea* tadpoles, which have commenced turning into froglets.

The owners of the private property where they were found, are very excited about the find and happy to help protect the frogs and their habitat.



Back from the dead: the yellow-spotted bell frog was thought to be extinct for more than 30 years (ABC)

The Yellow-spotted Bell Frogs were first described in 1867. At one stage about 1975 they were called *Litoria flavipunctata* and were last seen West of Guyra in 1978. Are the Southern populations, last seen in 1973, the same as the Northern species? The older, snake keeping residents of the Bathurst district, who collected, photographed and recorded frogs were able to shed further light on this species, last seen there in 1977.

Judy Harrington presented great slides about FATS' inaugural week-long field trip to Dorrigo and beyond, including the wonderful birdlife. The troupe swam creeks, climbed mountains, assembled tents in magnificent camping areas, photographed diverse wildlife, such as frogs of course, snails, birds, leaches and turtles, went frogging, walked through rain forests, sat around the fire at night and had a unique adventure. Thank you Judy for your entertaining presentation.



Feb 2010 Building 22 farewell. The "girls" of the FATS committee left to right (plus Arthur White) Marion Anstis, Wendy Grimm, Punia Jeffery, Monica Wangmann & Karen White. Photo Phillip Grimm

The meeting ended with our raffles with many winners, loads beverages and tasty home made munchies. Many thanks to our regular contributors of culinary delicacies, Karen White, Fiorella Nelson and Wendy Grimm. **MW**

GROWLING GRASS FROGS GET \$100K HOME



The Growling Grass Frog. Picture: Alex Coppel

Three frogs living on land earmarked for Victoria's biggest horse racing precinct are heavily backed for survival - but it's costing the developers more than \$100,000. The *Herald Sun* reports plans for the \$40 million hub, to be built in Tynong, east of Pakenham, hit a hurdle when the tiny amphibians were found during a compulsory "flora and fauna" audit of the area.

The discovery means the Pakenham Racing Club must build a new home for the growling grass frogs, which are an endangered species. "We've done our flora and fauna studies and our cultural heritage studies, as required by law for any of these significant developments," the club's chief executive, Michael Hodge, said. "And yes, we have found what is called the growling grass frog. "As a consequence of that, we need to do a 'growling grass frog management plan' and submit that to the appropriate government authorities for approval. "We'll be looking to relocate those frogs, all three of them, in the next 12-18 months. "We're building a new (wetlands) habitat for them."

Mr Hodge said accommodating the frogs would cost "in excess of \$100,000", and admitted that he was initially surprised by the measures required. But he said the club was more than happy to comply. "We acknowledge it's a lot of time, money and effort, but we don't have a problem with that," Mr Hodge said. "The club respects that the frog is an endangered species, and the law is the law."

The new racing precinct, being built on 245ha in Tynong, is due to open in 2013. Mr Hodge said 14ha had been set aside for wetlands. This will include a series of ponds for the frogs, and water filtration systems and dams needed to meet other environmental criteria. "We're still finalising the master plan for the entire site," he said. "But the wetlands will be the first thing that will be constructed, because we need to relocate the frogs".

Mr Hodge said the flora and fauna audit was completed in the middle of last year. The growling grass frog, a ground-dweller, is one of Victoria's most endangered frogs.

Growing up to 10cm long, they are bright green and bronze with a "warty" back and have a distinct three-note call, which has been likened to the sound of a duck being strangled.

<http://www.theaustralian.com.au:80/news/breaking-news/growling-grass-frogs-get-100k-home/story-fn3dxity-1225850711853> By Evonne Barry Herald Sun 7 April Sent to FrogCall by Andrew Nelson.

STUDY

WEEDKILLER ATRAZINE CASTRATES FROGS

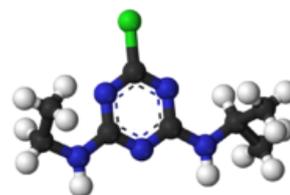
ONE of the most common weed killers in the world, atrazine, causes chemical castration in frogs and could be contributing to a worldwide decline in amphibian populations. Researchers compared 40 male control frogs with 40 male frogs reared from hatchlings until full sexual maturity, in atrazine concentrations similar to those experienced year-round in areas where the chemical is found.

Ninety per cent of the male frogs exposed to atrazine had low testosterone levels, decreased breeding gland size, feminised laryngeal development, suppressed mating behaviour, reduced sperm production and decreased fertility. **And an alarming finding of the study was that the remaining 10 per cent of atrazine-exposed male frogs developed into females that copulated with males and produced eggs.**

The larvae that developed from those eggs were all male, according to the study by researchers at the University of California at Berkeley, which was published in the *Proceedings of the National Academy of Sciences*. Earlier studies have found that atrazine feminised zebra fish and leopard frogs and caused a significant decline in sperm production in male salmon and caiman lizards. "Atrazine exposure is highly correlated with low sperm count, poor semen quality and impaired fertility in humans," the study said.

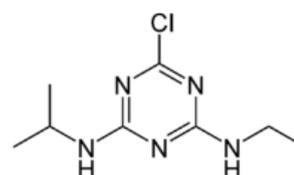
Atrazine is widely used by farmers around the world as a weed- and grass-killer, particularly in production of corn, sorghum and sugar cane. According to the Washington-based Natural Resources Defense Council, the chemical herbicide has been banned in the European Union, although advocates for atrazine, who say the weedkiller increases crop yields, say only some European countries have banned it.

1225836005219 2/3/2010 Sent to FrogCall by Lothar Voigt and Andrew Nelson
<http://www.news.com.au/breaking-news/weedkiller-atrazine-castrates-frogs-study/story-e6frku0->



IUPAC name

1-chloro-3-ethylamino-5-isopropylamino-2,4,6-triazine



ATRAZINE <http://en.wikipedia.org:80/wiki/Atrazine>

Properties

Molecular formula	C ₈ H ₁₄ ClN ₅
Molar mass	215.68 g mol ⁻¹
Appearance	colourless solid
Density	1.187 g/cm ³
Melting point	175 °C (448 K)
Boiling point	200 °C (473 K)
Solubility in water	0.007 g/100 mL (?°C)

Except where noted otherwise, data are given for materials in their standard state (at 25 °C, 100 kPa)

Atrazine, 2-chloro-4-(ethylamine)-6-(isopropylamine)-s-triazine, an organic compound consisting of an s-triazine-ring is a widely used herbicide. Its use is controversial due to its effects on nontarget species, such as on amphibians, and because of widespread contamination of waterways and drinking water supplies. Although banned in the European Union, it is still one of the most widely used herbicides in the world. Like many herbicides, it is sold under numerous trade names.

Biodegradation

Atrazine degrades in soil by the action of microbes. The half-life of atrazine in soil is 13 to 261 days. Atrazine biodegradation can occur by two known pathways: 1) Hydrolysis of the N-Cl bond, followed by the ethyl and isopropyl groups, catalyzed by the hydrolase enzymes called AtzA, AtzB, and AtzC. The end product of this process is cyanuric acid, itself unstable with respect to ammonia and carbon dioxide. The best characterized organisms that utilize this pathway are of *Pseudomonas* sp. strain ADP.2) Dealkylation of the amino groups to give 2-chloro-4-hydroxy-6-amino-1,3,5-triazine, the degradation of which is unknown. This path also occurs in *Pseudomonas* species as well as a number of bacteria. SNIP

The genes for enzymes AtzA-C have been found to be highly conserved in atrazine-degrading organisms worldwide. The prevalence of these genes could be due to the mass transfer of AtzA-C on a global scale. In *Pseudomonas* sp. ADP, the Atz genes are located non-contiguously on a plasmid with the genes for mercury catabolism. This plasmid is conjugatable to Gram negative bacteria in the laboratory and could lead to the worldwide distribution, in view of the extensive release of atrazine and mercury. AtzA-C have also been found in a Gram positive bacterium but are chromosomally located. The insertion elements flanking each gene suggests that they are involved in the assembly of this specialized catabolic pathway. Two options exist for degradation of atrazine using microbes, bioaugmentation or biostimulation.

The Controversy

According to Extension Toxicology Network in the U.S., "The oral LD₅₀ for atrazine is 3090 mg/kg in rats, 1750 mg/kg in mice, 750 mg/kg in rabbits, and 1000 mg/kg in hamsters. The dermal LD₅₀ in rabbits is 7500 mg/kg and greater than 3000 mg/kg in rats. The 1-hour inhalation LC₅₀ is greater than 0.7 mg/L in rats. The 4-hour inhalation LC₅₀ is 5.2 mg/L in rats."

Atrazine use in pounds per square mile by county. Atrazine is one of the most commonly used herbicides in the United States. Atrazine was banned in the European Union (EU) in 2004 because of its persistent groundwater contamination. In the United States, however, atrazine is one of the most widely used herbicides, with 76 million pounds of it applied each year, in spite of the restriction that used to be imposed. It is probably the most commonly used herbicide in the world, and is used in about 80 countries worldwide. Its endocrine disruptor effects, possible carcinogenic effect, and epidemiological connection to low sperm levels in men has led several researchers to call for banning it in the US.

Effect on amphibians

Atrazine is a teratogen, causing demasculinization in male Northern Leopard Frog even at low concentrations, and an estrogen disruptor. A 2002 study found that exposure to atrazine caused male tadpoles to turn into hermaphrodites - frogs with both male and female sexual characteristics. But another study, funded by Syngenta, was unable to reproduce these results. Tyrone Hayes, Department of Integrative Biology, University of California, notes that all of the studies that failed to conclude that atrazine caused hermaphroditism were plagued by poor experimental controls and were funded by Syngenta, the company that produces the chemical. The U.S. Environmental Protection Agency (EPA) and its independent Scientific Advisory Panel (SAP) examined all available studies on this topic — including Hayes' work — and concluded that there is "currently insufficient data" to determine if atrazine affects amphibian development. Hayes, formerly part of the SAP panel, resigned in 2000 to continue studies independently. The EPA and its SAP made recommendations concerning proper study design needed for further investigation into this issue. As required by the EPA, Syngenta conducted two experiments under Good Laboratory Practices (GLP) and inspection by the EPA and German regulatory authorities. In 2006 the EPA concluded that the triazine herbicides posed "no harm that would result to the general U.S. population, infants, children or other...consumers." In 2007 the EPA held another SAP on the topic and concluded "that atrazine does not adversely affect amphibian gonadal development based on a review of laboratory and field studies, including studies submitted by the registrant and studies published in the scientific literature." On its website in July 2009, the Agency said "At this time, EPA believes that no additional testing is warranted to address this issue." A 2008 study reported that tadpoles developed deformed hearts and impaired kidneys and digestive systems when exposed to atrazine in their early stages of life. Tissue malformation may have been induced by ectopic programmed cell death, although a mechanism was not identified. Some studies suggest that even the concentrations meeting U.S. federal standards may be dangerous, with implications for human birth defects, low birth weights and menstrual problems

Extracts from Wikipedia articles sent to FrogCall by Lothar Voigt and Andrew Nelson

Frogs, Zoologists & the French Connection A Short History.

The Australian continent had been intermittently navigated and mapped by Europeans since about 1600's. By the late 1780's, detailed mapping of our coastline and the study of the Australian landscape and her native population had begun in earnest. The urgency to study the Australian coastline arose from the great uncertainty over whether the Great South Land was merely one continent or two separate ones. The British had already laid claim to the Australian east coast. It was not conclusive to the early explorers whether the roughly-sketched west Australian coast was part of the same continent. For both the British and their colonial rivals, the French, this would have both significant strategic military implications and long-term commercial consequences.

Set against a backdrop of national rivalries and competing colonial ambitions, the French assumed a formidable presence in our region, carrying out much valuable scientific research. Many of the scientific personnel aboard these early French vessels became names forever associated not just with our froglife and scientific study, but also with the naming of geographic landmarks and the exquisite portrayal of our natural history in numerous sketches, drawings and paintings.

From the earliest years of exploration, the French had been carrying out scientific study in the Pacific. In 1785, La Perouse had set sail with a complement of scientists, famously arriving in Botany Bay on 26 January 1788, just in time to witness the founding of the colony. After a short stay in Sydney, he set out for New Caledonia for further scientific work and was never seen alive again.

His disappearance caused much concern in his native France, and a second expedition was launched to search for the vessels of the much-revered La Perouse. This expedition was led by Antoine de Bruni d'Entrecasteaux. D'Entrecasteaux was also given the task of exploring the coastline of Van Diemen's Land (Tasmania). The safe harbours near the mouth of the Derwent River (Hobart,) are amongst his discoveries. The D'Entrecasteaux Channel and Bruny Island commemorate his name today. Botanists and reptile enthusiasts would also be familiar with the name of Jacques **La Billardiere**, who was the botanist aboard and chronicled the voyages of that expedition. Amongst numerous plant and animal species named after him, the skink, *Ctenotus labillardiere* honours his name. D'Entrecasteaux never discovered the fate of the La Perouse expedition. The wreckages of the two La Perouse vessels were eventually found washed up

on the reefs of the Santa Cruz group of islands much later in 1827.

Despite the outbreak of hostilities between Britain and France in 1793, and the tremendous upheavals of the Napoleonic campaigns, the scientific communities of both England and France had retained very cordial relations. Joseph Banks, a luminary of British science, remained a close friend of the director of the Natural History Museum of Paris, Antoine Jussieu.

It was this relationship that secured, in a time of war, the safe-conduct documents required for the safe passage of the scientific expeditions of the Frenchman Nicolas Baudin, (and some months later, Matthew Flinders of the British Command). Unfortunately, while scientific concerns were ostensibly the noble aims of these expeditions, political and military influence ensured that science, empire and economic ambitions became inextricably linked.

Baudin, in charge of the vessels *Le Geographe*, and *Le Naturaliste*, set sail in 1800. On board were Henri and Louis **Freycinet**, capable naval men who would both go on to achieve highly distinguished naval careers. Louis Freycinet is honoured in the name *Litoria freycineti*. Louis Freycinet's mapping of the north-west Australian coastline is considered by many cartographers to be superior to the mapping undertaken by Matthew Flinders, who was himself regarded as an extremely formidable cartographer. An assortment of zoologists, astronomers, hydrographers, geologists and botanists completed the ship's scientific contingent.

One of the scientists on board was Francois **Peron**, who would in time acquire a well-merited reputation as an anthropologist and zoologist, although he did possess the annoying habit of becoming so absorbed in nature that he would frequently become lost and would need to spend a night on shore, having to be rescued by a search party the next day. Together with a disenchanted Louis Freycinet, Peron would eventually write up a generally derogatory and perhaps somewhat unfair account of Baudin's competency and expedition failings. Also accompanying the expedition were two talented young men, Charles-Alexandre **Lesueur** and Nicholas-Martin Petit.

Both had ostensibly been hired as assistant gunners, although Baudin simply preferred their artistic work to the ship's official artists and saw to it that they were on board his scientific vessel. In an age before cameras, official artists were responsible for working with scientists to accurately record anatomical detail of specimens for later research by museum staff at home. In addition, these artists recorded coastal profiles (for naval navigation) as well as documenting landscape and anthropological details for state and scientific purposes. Lesueur and Petit proved their worth as

talented artists, in time, effectively replacing the ship's official artists. Together, Lesueur and Petit have recorded some of the most enduring images of Australian natural history and the early settlement of Sydney. Petit was certainly destined to become an influential figure of Australia natural history and no doubt would have become a name familiar to modern frog enthusiasts. Sadly, Petit's career was cut regrettably short, dying of gangrenous infection at 28 years of age.

Forever linked to the Baudin expedition is the scientific expedition of Matthew Flinders. The two expeditions famously met at Encounter Bay, off the South Australian Coast in April, 1802. On board the Flinders' *Investigator* was Ferdinand Baur, an accomplished Austrian artist, eminent botanist Robert Brown and the landscape artist William Westall. All enjoy iconic status in Australian science and art today. Flinders himself, an enthusiastic naturalist, was mapping the still-incompletely known southern coastline.

Despite being at war, the meeting between Flinders and Baudin was exceedingly warm and brimmed with scientific camaraderie, with both captains sharing much scientific information and exchanging updated coastline maps that would assist the other. It was not to be the only occasion that professional respect and courtesy would be called upon by these scientists from opposing nations. Many months later, Baudin's vessel limped into Port Jackson with a large contingent of his crew critically ill and his ship in a poor and battered condition. Baudin himself later praised Governor King for the '*extreme kindness, unfailing medical care of my men and deep generosity in the re-fitting and re-supplying of my vessel*' - all while in a so-called 'enemy-port'! The Baudin crew enjoyed the freedom of the city while Baudin and Governor King quickly established what would become a life-long friendship. Curiously, Peron mischievously spread rumors in an attempt to disrupt the friendship.

Today, the Baudin expedition is perhaps only formally acknowledged in a rather trifling way in the names of *Cape Naturaliste* and *Geographe Bay* in W.A., both sites being named after Baudin's vessels. For Australians, Baudin never achieved the heroic status of Flinders. Even in his native France, naval rivalries and domestic politics engulfed the achievements of the Baudin expedition. It perhaps deserved greater respect for the astonishing numbers of zoological specimens collected and the vast amount of information gathered from the Great South Land, a zoological and anthropological contribution that far exceeded that of the Flinders' expedition, or for that matter, any other expedition, British or French.

Three decades later, in 1842, Jules **Verreaux** arrived in Australia. Verreaux had been sent around the world to collect specimens for various French scientific institutions. Landing in Australia, he had already survived one shipwreck in his career. This shipwreck had cost him his scientific collection gathered over fifteen years. Departing Australia, he returned to France in the early 1850's to take up a post at the National Museum of Paris.

Some of the French identities that we celebrate in our frog names never made it to Australia. Andre **Dumeril**, was Professor of Anatomy at the Museum of Natural History, Paris, in the early 1800's. He specialized in herpetology and entomology and remained an influential figure in zoology all of his life.

Interestingly, his assistant at the Museum was one Gabriel **Bibron**. Bibron was also a herpetologist, describing many South American species that had come into the Museum's collection. He was also a skilled and conscientious museum worker whose talents Dumeril had come to appreciate. Dumeril enjoyed Bibron's company and they collaborated on many major zoological works. Dumeril was devastated at the early and untimely death of his good friend at only 42 years of age. Dumeril's son, Auguste, took over Museum duties upon his father's retirement and served with distinction. Australian citations generally however refer to Dumeril the elder.

Early British naturalists certainly eclipsed the reputations of the French scientists in Australian culture. Our British heritage ensured that we were more exposed to British accounts and publications. Men like Matthew Flinders also spent considerable time writing up and embellishing log entries into a very readable and commercially lucrative account of their expeditions.

For the French version, we need to rely on Baudin's official, drier, and therefore less popular log entries for his account. Peron's rather poisonous account also dented much of the credibility of the Baudin expedition. Some French zoologists essentially remained in their native home. Their remoteness from Australia often ensured their role in Australian or international zoology was largely overlooked here.

Fortunately, in the scientific names of many of our frogs, we do acknowledge the significant contribution, the sometimes tragic sacrifice, and the lasting legacy of early French scientific endeavour in Australia.

*FATS recently ran a fieldtrip highlighting the prevalence of French names associated with our frogs. Following a number of enquiries we have included the following article. **Robert Wall***

FROG TADPOLES 'SCREAM' UNDERWATER DISCOVER SCIENTISTS

Tadpoles of one frog species let out an audible "scream" when they come under attack, scientists have discovered. They only make the noise, described as a brief, clear metallic sound made up of a series of notes, when in distress. It is the first time any vertebrate larva has been found to use sound to communicate underwater. The discovery that frog tadpoles can make sounds also raises the possibility that a host of aquatic larvae communicate in a similar way.

The distress calls are made by tadpoles of the horned frog *Ceratophrys ornata* which lives in Argentina, Uruguay and Brazil, researchers report in the journal *Acta Zoologica*. Scientist Dr Guillermo Natale of the National University of La Plata in Buenos Aires, Argentina, and his colleagues, were studying the mating calls of adult frogs.

Many adult amphibians use loud sounds such as croaks to advertise their presence, and often to attract sexual partners. Until now though, researchers did not realise that amphibian larva might also produce sounds underwater.

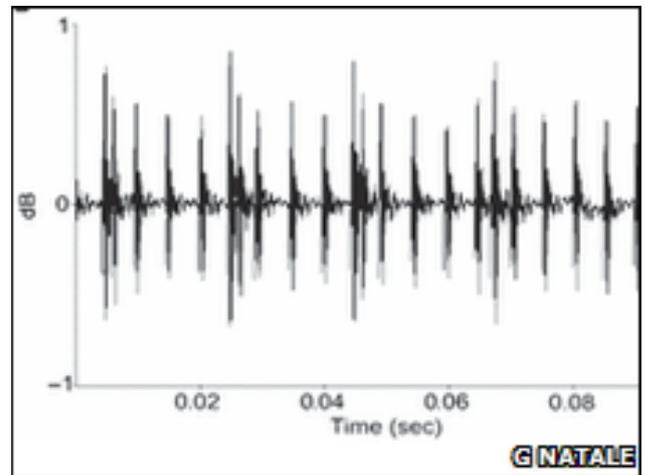
That changed when Dr Natale caught a horned frog tadpole in a pond using a hand-held net. *C. ornata* tadpoles are difficult to find in the wild, so the researchers caught a wild pair of breeding adults, and began a programme to rear the young amphibians in captivity. This enabled the scientists to better study the noise they had heard in the field.

The team discovered that *C. ornata* tadpoles are naturally aggressive and carnivorous, often eating the tadpoles of other frog species that they encounter. However, "much to our astonishment, they do not eat each other," says Dr Natale, who is also an assistant researcher Argentinean Research Council (Conicet). That may be because of the "screams" emitted by the tadpoles. The researchers found that when *C. ornata* tadpoles come into contact with, or are prodded by, an external object such as a metal spatula, they let out a brief, metallic sound consisting of a short series of higher frequency pulses. Each "scream" lasts for just 0.05 seconds. Producing distress calls is likely to help prevent the tadpoles cannibalising each other.

Underwater call

The tadpole produce the sound by pushing air out of their lungs. The lungs develop very early in this species; tadpoles that are just three days old are capable of emitting loud distress signals. They continue to emit distress calls underwater both as tadpoles and after they have begun metamorphosis (when they become frogs).

The tadpoles also produce the sounds when they are removed from the water. In fact, when out of the water, they make the distress call more frequently. This could be because the tadpoles can more easily access air, which they then expel.



An oscillogram show the pulsated structure of the tadpole's distress call with pulsated structure

"That tadpoles communicate somehow is simply amazing," says Dr Natale. "They possess the structures to do so within 3 days of life."

He and his colleagues now want to study how and why the ability develops so rapidly, and how the sound is perceived by other tadpoles. "[We want to know] what information specifically is communicated," he says. Few larvae of any animal species are known to produce sounds. Those that do tend to be insect larvae, which live on land, making their sounds into the air rather than underwater. For example, juveniles of one species of common silkworm caterpillar (*Antheraea polyphemus*) make "clicking" sounds with their mandibles to warn off predators such as ants.

But as far as the researchers can tell, horned frog tadpoles



A female adult horned frog

are the first underwater larvae, and first larvae of any vertebrate, to make sounds.

The discovery could have far-reaching implications for our understanding of the behaviour and ecology of amphibians, many of which are threatened by disease, habitat destruction and illegal trade. "We have definitely underestimated their abilities," says Dr Natale. "In more than 200 years of [amphibian research] this has never been reported."

http://news.bbc.co.uk:80/earth/hi/earth_news/newsid_8609000/8609235.stm By Matt Walker Editor, Earth News sent to FrogCall by Andrew Nelson



All change for the Papua New Guinea frog (left: a young frog and right: an older member of the same species)

NEW SPECIES OF PAPUA NEW GUINEA FROG CHANGES COLOUR

A new species of frog undergoes a remarkable transformation as it grows into an adult, report scientists. Shiny black juvenile frogs with yellow spots dramatically change into peach coloured adults with bright blue eyes. Scientists discovered the unique frog in a remote part of south-eastern Papua New Guinea. The bright pattern of the young frog could act as a warning to predators, they say, but it is a mystery why the adult then loses this colour.

The scientists from Bishop Museum in Honolulu, Hawaii, US, report their findings in the journal *Copeia*. Amphibian species come in a range of colours and patterns, from the brightly patterned poison dart frogs to the plainer greens of the common toad.

After metamorphosing from a tadpole, some frogs change in colour as they get older. However, it is unknown for juveniles and adults of a species to have strikingly different colour and pattern schemes.

The research team came across the new species of frog *Oreophryne ezra* while on an expedition to find new species on Sudest Island, Louisiade Archipelago, off the south-eastern tip of New Guinea.

Of the new species they found, the frog particularly caught their attention. "It's always exciting to discover a species you know to be new. However, the obviously unusual biology of this frog made its discovery especially exciting," says Dr Fred Kraus who along with Dr Allen Allison undertook the study. "The remarkable thing about this frog is the drastic nature of its change in colour pattern as it matures from a tiny froglet into adulthood," Dr Kraus says.

Consisting of more than 5,000 species described, frogs are among the most diverse groups of vertebrates. Populations of certain frog species are declining significantly, due to habitat loss, climate change and the spread of an infectious fungus.

There is increasing evidence that some frogs around

the world synchronise their mating activity by the full Moon

As a juvenile the frog is dark black with yellow spots and black eyes but then switches to a uniform peach colour with blues eyes. "This raises the question of what possible function the striking colours of the juveniles might serve," says Dr Kraus.

Juveniles closely resemble the general appearance of some of the poison dart frogs from the tropics.

Like these frogs, the colouration could serve as a warning to potential predators.

Although untested, the frog may also have harmful toxins in its skin like those present in poison dart frogs. Poison dart frogs have skin that contains harmful alkaloids acting as a chemical defence against predation.



"If this is the case this would make this species another instance of the independent evolution of such a system," says Dr Kraus.

The behaviour of the frog also points to the idea that its colour advertises that it is toxic. The researchers write how the juvenile frogs perch in conspicuous places during daylight hours and also demonstrated a lack of a well developed escape behaviour, indicating that they have another form of defence.

One aspect that cannot be explained is if the colour offers protection to the juvenile, why does the frog then change its colour scheme as it ages to one that offers no protection.

For now this poses further questions for the researchers. "No other such instance is known in frogs," Dr Kraus says. "If it does serve as protective warning colouration, the reason for its loss remains a mystery."

Sent to FrogCall by Andrew Nelson By Jody Bourton Earth News reporter
http://news.bbc.co.uk:80/earth/hi/earth_news/newsid_8483000/8483739.stm

'UNIQUE' FROG SPECIES DISCOVERED BY SCIENTISTS IN INDIA



The frog's habitat is less than three square kilometres in size

A new species of "brightly coloured frog" has been discovered in a remote peak in the southern part of India, scientists have told BBC News. This reddish orange amphibian, spotted in the Eravaikulam National Park of the Western Ghats mountain range, has been named *Raorchestes resplendens*.

The scientists found the frog at an altitude of 2,698m above sea level on the Anaimudi peak. It inhabits a very small area of less than three square kilometres. The discovery was made by a team of scientists including Dr S D Biju, from the School of Environmental Studies at the University of Delhi. His collaborators were Yogesh Shouche of the National Centre for Cell Sciences in Pune; S Dutta from North Orissa University, Franky Bossuyt of the Free University of Brussels, Belgium and Alain Dubois of the France-based organisation Reptiles et Amphibiens.

The frog was initially identified back in 2001. Dr Biju, who led the authentication study, explained that it took almost a decade to show, via careful study of its anatomy and genome, that this brilliantly coloured specimen was in fact a new species. "This new species of frog has got extremely short limbs and multiple glands and swellings almost like a toad," Dr Biju told BBC News.

The species is a unique new member of the tree frog group, he explained. It is the only tree frog to have what the researchers call "macro glands".

Mysterious glands

The purpose of these glands is uncertain, and the scientists are now carrying out further studies of their role and function. The team's first step in confirming the frog as a new species was to study its breeding behaviour, comparing it to more than 200 species of frogs living in South East Asia. "This took almost seven years," said Dr Biju.

Molecular labelling techniques were also used to distinguish this species from the other varieties.

The team also made the genome map of the new specimen available via the International Gene Bank, so it could be verified and studied further by other researchers.

Tribute to a pioneer

In naming the newly discovered species *Raorchestes resplendens*, the scientists have paid tribute to a pioneer in the field of herpetology - the study of amphibians.

Franky Bossuyt, a member of the team chose the first part of the name in honour of late Professor C R Narayan Rao, a herpetologist who was internationally renowned for his contribution to the study of amphibians in India.

The second part, *resplendens*, comes from the Latin word meaning brilliantly coloured or glittering and is based on the bright reddish-orange colouration of the frog's body.

According to the observations made by the scientists, females of the new species may mate with multiple males and possibly breed more than once in a single season. The tree frog also has extremely short limbs. "[These] have resulted in a much more pronounced crawling behaviour," said the researchers.

The scientists also observed that the frog buried its eggs under the moss-covered forest floor, deep inside the base of bamboo clumps.

Tiny habitat

These frogs may represent a classic example of "point endemism" in amphibians, says Dr Biju. This means that the species lives in a very limited range of environmental conditions, making it very vulnerable to extinction. The team say that fewer than one thousand of these frogs survive in a unique ecosystem that is less than three square kilometres in size.



The frogs have swellings, "almost like a toad"

The scientists discovered the frog on the Anaimudi peak in Eravikulam National Park

Its habitat will require "special attention" in order to conserve the species, says the team. About one third the world's amphibians are under threat from extinction. Habitat destruction due to human activity identified as a primary cause of their numbers being so drastically reduced.

Sent to FrogCall by Andrew Nelson
<http://news.bbc.co.uk/2/hi/science/nature/8675828.stm> Sivaramakrishnan Parameswaran
Producer, BBC Tamil Service

FIELD TRIPS

The Field-trips programme is in its Autumn/ Winter Recess. No fieldtrips scheduled.

The 2010/2011 Spring/Summer Programme commences in September. With many new members joining FATS in recent times, I thought it timely to once again publish our Code of Conduct. It is important for all members to be familiar with this document, particularly those intending going out in the field.

FATS Code of Conduct.

Privately undertaken fieldtrips need to meet all departmental and FATS Group conditions. It is the responsibility of each participant to be familiar with any requirements and ensure the fieldtrip meets all conditions and complies with all hygiene protocols as laid down by authorities. If in any doubt, check with a committee member or contact the Area Manager of NPWS or State Forests.

Members will respect the rights of private landowners and will not enter private property unless permission has been granted. FATS will not tolerate any incident of illegal, unethical or anti-social behaviour, or any behaviour that brings the FATS Group into disrepute or unfairly damages the reputation of any member.

Please Note: Prosecution by authorities will not preclude FATS from issuing its own, additional disciplinary measures. A decision by authorities not to commence legal proceedings, or launching unsuccessful proceedings against a member, will not necessarily excuse that member from disciplinary action from the FATS Group. The FATS Group reserves the right to expel any member for serious or repeat offences **The FATS Committee.**



FATS FROG-O-GRAPHIC COMPETITION

In 2008, FATS conducted the first Frog-o-graphic competition. This proved very successful as we have many creative people in the group who take marvellous photo, do incredible drawings and art works, can sculpt, potter or create frog do-dahs from just about anything. Here is your chance to show off your skills.

There are several categories in this competition: Best Frog Image (Adult), Best Frog Image (Junior), Most Interesting Frog Image (Adult), Most Interesting Frog Image (Junior), Best Frog Artwork (Adult), Best Frog Artwork (Junior) and the People's Choice Award. The first six awards will be selected by a specifically hand-

INSURANCE DISCLAIMER FATS has public liability insurance for its various public functions. Members should be aware that this insurance does not cover FATS members, it covers the public and indemnifies FATS. We are currently checking with insurance firms to see whether a realistic group policy can be organised to cover FATS volunteers and people who attend field trips. **FATS MEETINGS** commence at about 6.30 pm, end about 10pm and are usually held on the **first Friday of every EVEN month February, April, June, August, October and December at the Education Center / Field Studies Centre, Bicentennial Park, Sydney Olympic Park, Homebush Bay.** Call or email us for further directions. Easy walk from Concord West railway station and straight down Victoria Ave. Take a strong torch in Winter. By car: Enter from Australia Ave at the Bicentennial Park entrance and drive through the park (one way road) or enter from Bennelong Rd/Parkway. It's a short stretch of 2 way road and park in p10f car park (the last car park before the exit gate). Turn off to the right if entering from the main entrance. We hold 6 informative, informal, topical and practical meetings each year. Visitors are welcome. We are actively involved in monitoring frog populations, other field studies, produce the newsletter FROGCALL and FROGFACTS information sheets. All expressions of opinion and information are published on the basis that they are not to be regarded as an official opinion of the Frog and Tadpole Study Group Committee, unless expressly so stated. Material from FROGCALL MAY NOT BE REPRODUCED without the prior consent of the Editor or President of FATS. Permission from FATS and/or author/s must be obtained prior to any commercial use of material. The author/s and sources must be fully acknowledged.

picked panel of judges while the People's Choice will be decided by the audience at the December Fats meeting.

How many times can you enter? Maximum six entries per person. **Please include name, age if under 18 and contact number.**

Is there a Prize? Fabulous prizes will be awarded for each division winner. No correspondence will be entered into the judge's decision. Please note: the entries must be original and your work. The winning entries will also be featured in a colour supplement in FrogCall. **Entry Date:** Entries may be submitted until the 1st of October 2010. So start painting, drawing, photographing or whatever you do to capture the essence of a frog. We look forward to see your entries.

Arthur White