Cyclorana novaehollandiae by Tim Halliday

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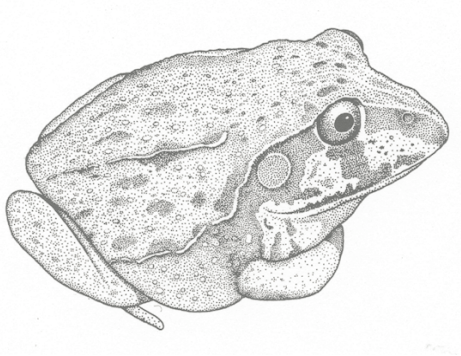


FROGLOG

Newsletter of the Declining Amphibian Populations Task Force

December 2002, Number 54.

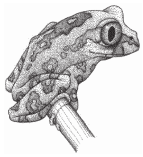
New Zealand Frog Week

During the first week of October, New Zealand celebrated, for the first time, a National Frog Week. The main aim of the week was to raise public awareness of the unique leiopelmatid frogs and the problems that they face in New Zealand today. There was also a focus on global amphibian declines and the consequences to the ecosystem of losing these important animals.

The week-long event, which culminated in a day of talks and hands-on experiences, was coordinated by Phil Bishop (DAPTF Working Group Chair, New Zealand). Phil produced and distributed background information and display materials to regional centres across the country. Overall, 24 institutions took part from Southland Museum and Art Gallery in Invercargill (South Island), through the country to Auckland Zoo in the north. After liaising with people organising International Amphibian Day in Maryland, USA, the final day of New Zealand Frog Week coincided with this event and consisted of a series of talks by New Zealand's frog scientists at Auckland Zoo. In addition, a local New Zealand TV celebrity, Suzy Cato (a self-confessed frog enthusiast), helped swell the crowds at Auckland Zoo and conducted a series of hands-on frog ID sessions for children.

Leiopelmatid frogs are very secretive and scarce and many members of the general public will have never encountered a native frog. As in most countries, children collect tadpoles from local ponds and watch them metamorphose into tiny frogs, but very few of them ever realise that these are larvae from exotic frogs originally introduced from Australia over 100 years ago. The New Zealand Frog Week was heralded a success and more people in New Zealand now realise the significance of New Zealand's native frogs; many of them were previously unaware of their existence. Auckland Zoo are soon to start building a purpose-built unit to house a captive breeding colony of *Leiopelma archeyi*, and it is expected that New Zealand Frog Week next year will be hosted by the zoo with the new native frog colony as a focal point. The success of the week in New Zealand may highlight an avenue for raising public awareness of the plight of amphibians and perhaps next year we should organise World Frog Week? With the backing of DAPTF and a World Frog Week coordinator, each Working Group Chair could coordinate the events in their country to raise the awareness of the plight of amphibians up another notch.

Contact: Phil Bishop, Department of Zoology, University of Otago, PO Box 56, Dunedin, New Zealand.
phil.bishop@stonebow.otago.ac.nz



Chytridiomycosis in Northern and Western Cape frog populations, South Africa

By Samantha Hopkins & Alan Channing*

Chytrid fungus has been discovered in *Xenopus laevis* populations in the Western Cape, South Africa (Speare & Berger 2000). A study carried out by Weldon (2002) on *X. laevis* in the Western Cape has shown that chytrid fungus is widespread and has been present in South Africa for at least two decades. No work had been carried out on the occurrence of chytrid fungus in other species in the area. *Afrana fuscigula* was chosen as the test species because it is widespread, with populations at high and low altitude, and it has a long larval period. All these factors are thought to make the frog more susceptible to chytrid infection. Other species were tested, such as *Afrana vandijki* and *Strongylopus grayii,* when *A. fuscigula* could not be found or when they were found in the same locality.

Seventeen sites in the Western Cape Province and two localities in the Northern Cape Province were visited. Both of the Northern Cape sites were in Goegap Nature Reserve. Every frog seen at a site was caught and a toe tip was taken. At three of the sites dead frogs were found and a toe tip was taken from these as well. These toe tips were then histologically examined for chytridiomycosis.

This study has shown that chytridiomycosis is widespread throughout the Western Cape in *A. fuscigula*. Chytrid fungus was found in frogs at ten of the 17 sites. When chytridiomycosis was discovered in a population, not every individual at the site had the disease. Infection was found at low and high altitude sites and in contrasting surrounding habitats. Chytrid infected frogs were found in rivers in town centers, where there is a lot of human activity, as well as in nature reserves, where human impact upon sites is minimized.

In the two pools in Goegap Nature Reserve, chytrid was found in every frog examined, except one. In one of the pools, 12 dead frogs were discovered and one of these was collected for examination.

At the sites in the Western Cape, no mass die-offs were seen, although chytrid fungus was found in several individuals. The individuals with chytrid infection seemed healthy. The *A. fuscigula* in the Western Cape that we tested are either able to mature while carrying chytrid infections, or infection only occurs later in the life cycle. At the two sites in Goegap Nature Reserve, we found many dead frogs and high levels of chytrid infection. This suggests that another factor is contributing to the die-offs at the two Goegap sites as individuals from the Western Cape sites, from the same species, have similar chytrid infections and there have been no mass die-offs. It may be that the chytrid infection is

opportunistic after another factor has caused the animal's immune system to be compromised.

Contact: Samantha Hopkins, Department of Zoology, University of the Western Cape, Private Bag X17, Bellville, 7535, South Africa.
shopkins@uwc.ac.za

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Weldon, C. (2002). Chytridiomycosis survey in South Africa. *Froglog*. 51:1-2.

(* This project was supported by a DAPTF Seed Grant)

Global Amphibian Assessment Makes Rapid Progress

By Simon Stuart, Conservation International / IUCN-SSC

The Global Amphibian Assessment (GAA) project is progressing rapidly with regional coordinators now in place for all parts of the world, and initial data collection complete for most regions of the world. Data collection is now nearing completion in the last few regions: Ecuador, Peru, the Guyanan Shield and West Asia. In total, data have now been received for about 5,200 of the world's 5,500 known amphibian species. GAA workshops have now been held in Australia, China, India, Thailand, Kenya and Costa Rica, and others will be held in the first half of 2003 to cover South America, the Caribbean Islands, and New Guinea.

Although it is too early to draw an overall picture of the results, there are some reasons for concern. For instance, preliminary evidence suggests that nearly half of the species in the Caribbean islands fall into the IUCN Categories of Critically Endangered and Endangered. High levels of threat have also been recorded for Africa, tropical Asia, China and Central America. In Madagascar, where 99% of the species are endemic and many new species have been discovered in recent years, the tiny, beautiful Mantella frogs - the jewels of the rainforest floor – are especially threatened by a combination of habitat loss and over-collecting.

Several important steps need to be taken over the next 6-12 months. These include: holding the remaining GAA workshops, correcting the data on each of the species, analyzing the data, and producing the overall GAA report. The assessment is intended to be the start of an ongoing process to implement long-term monitoring of amphibians worldwide. In addition, the GAA is a great opportunity to help develop the new IUCN/SSC Global Amphibian Specialist Group (GASG) which consists of regional sections. It is hoped that the process of collecting and reviewing data will encourage herpetologists to join the group.

Coordination of this project is being provided by the Conservation International/Center for Applied Biodiversity Science – IUCN/SSC Biodiversity Assessment Unit. The team, consisting of Dr. Simon Stuart, Janice Long and Neil Cox, is responsible for program administration and technical support. Significant assistance is being provided by NatureServe, with Dr. Bruce Young coordinating work in the Americas (excluding the Caribbean Islands), from which around half of the world's amphibian species are known.

Contact: Simon N. Stuart, CI/CABS - IUCN/SSC Biodiversity Assessment Initiative, c/o Center for Applied Biodiversity Science, Conservation International , 1919 M Street NW, Suite 600, Washington DC 20036 , USA.
Office phone: 1/202/912-1490
Mobile phone: 1/202/437-1404
Fax: 1/202/912-0772
simon.stuart@iucn.org *or* **s.stuart@conservation.org**

First Records of Organochlorine Pesticide Residues in Amphibians of the Mesopotamic Region, Argentina

By R. Lajmanovich, E. Lorenzatti, P. de la Sierra, F. Marino & P. Peltzer

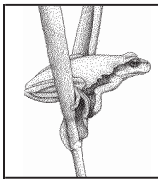
The impact of pesticides on amphibians has been clearly and effectively described in several regions of the world. However, in Latin America there is scarce information on the presence of residual insecticides in frogs and toads. Because of their long environmental persistence, continued toxicity and the potential for long distance atmospheric transport, the effects of organochlorine contaminants can be remote in both space and time. Our research determines concentrations of the principal organochlorine insecticides in amphibian species of the Mesopotamic region of Argentina. In addition, the biomagnification factors (BMF) in amphibian predators were calculated.

The specimens were collected from intensely agricultural regions of the Entre Ríos and Santa Fe provinces (Argentina) in 2002. We examined the fat and viscera of amphibian species (*Leptodactylus ocellatus*, *L. chaquensis*, *Hyla pulchella*, and *Bufo paracnemis*) found there. Moreover, fat and viscera of potential amphibian predators, snakes (*Clelia rustica*) and raptors (*Parabuteo unicinctus,*) were considered. Samples were later transferred to a commercial freezer and stored frozen until chemical analysis. Fat and viscera samples were analyzed for organochlorine compounds in the Institute of Technological Development for the Chemical Industry (INTEC). Samples were analyzed for α & δ HCH, aldrin, p´p´DDT, p´p´DDE, p´p´DDD, heptachlor, heptachlor epoxide, α & δ chlordane, α & β endosulfan, dieldrin, and endrin. The commercial standard was provided by Chemicals Service, USA (99% purity). For details of the methodology, please contact the authors.

The mean chlordane concentration in frog and toad tissue was 18.5 ng/g (minimum 13, maximum 24). The tissue residue concentrations were highest in snakes with a BMF of 166. In amphibian tissue, the mean endosulfan was 12.5 ng/g (minimum 6, maximum 19) and the BMF in raptors was 288. The other organochlorine residues were lower than the detection limits. Organochlorine levels reported in this study are generally low and suggest that wild fauna resident in the Mesopotamic regions are probably not affected by local organochlorine contamination. However studies on the biomagnification values should be continued. The evaluation of affected wild populations to minimize adverse impacts to wildlife resources should be considered.

Contact: Rafael Lajmanovich, National Institute of Limnology (INALI-CONICET), José Macias 1933 (3016), Santo Tomé (Santa Fe) Argentina. **inali@ceride.gov.ar**

Eduardo Lorenzatti, Institute of Technological Development for the Chemical Industry (INTEC-UNL-CONICET), Güemes 3450, (3000) Santa Fe, Argentina.
eloren@intec.ceride.gov.ar



Amphibian Decline in Israel – A New Research Project

From Avital Gasith

Six amphibian species (2 urodeles and 4 anurans) are found in Israel, a semi-arid region. In recent years we gathered circumstantial evidence of a significant decline of the population of the green toad, *Bufo viridis*. This formerly very common species is now endangered in the central part of the country. This prompted us to initiate an investigation of the possible reasons for this decline. Presently, we are conducting a study in which we are trying to assess possible impact of ecological and environmental factors on the distribution and population size of *Bufo viridis* and *Hyla arborea*. The two species overlap in their breeding period and breed in the same pools. Whereas *Hyla* is maintaining a reasonably large population, *Bufo* is not. This hints to the fact that a difference in their biology is responsible for the difference in their ability to cope with ecological and environmental changes (e.g., urbanization). We welcome contacts with researchers who share similar interest.

Contact: Prof. Avital Gasith (**zoohead@post.tau.ac.il**), Dr. Sarig Gafny and Eldad Elron, (**eldad@post.tau.ac.il**) (a PhD student who conducts this research) *at:* Zoology Department and Institute for Nature Conservation Research, Tel-Aviv University, Tel-Aviv 69978, ISRAEL.

EU Takes Note of Atrazine Research

[**Atrazine Levels Threaten Frog Populations**, *reproduced with kind permission from* Pesticide News (2002) **57:** 16.]

By Roslyn McKendry, Pesticide Action Network

A recent US study established that levels of atrazine as low as 0.1 µg/litre (equivalent to 0.1 parts per billion) in water are sufficient to demasculinise frogs[1]. An analysis performed by the Environment Agency shows that 10 sites in England and Wales had concentrations of atrazine higher than this between March and June 2000. Computer modelling predicted a further 13 catchment sites affected.

Atrazine is one of the most widely used herbicides in the US and worldwide. Certain crops (most importantly maize) are tolerant of its effects and consequently atrazine is used to control weeds in these fields. However, there has been considerable concern over atrazine both due to its persistence in groundwater and soil, and to its potential to damage human health and the environment[2].

The major health and environmental concerns over atrazine are due to its ability to interfere with a range of hormone systems[3]. Most studies document effects on sexual development and the ability to reproduce. While these studies are convincing they have mainly used high concentrations of atrazine. This has left uncertainty over whether atrazine can be detrimental at the concentrations normally found in the environment and in drinking water (3 µg/litre is the maximum for drinking water in the US).

A new laboratory study carried out in the US found that atrazine can influence fundamental biological processes at concentrations much lower than previously thought. Tadpoles of the South African clawed frog, *Xenopus laevis*, were allowed to develop in different concentrations of atrazine and the effects studied. Concentrations as low as 0.1 µg/litre (30 times lower than the maximum allowed in US drinking water) were found to cause hermaphroditism (animals had both male and female sex organs) and concentrations of 1 µg/litre reduced the size of the male vocal organ which is vital to the frog mating ritual. The same effects have been found in wild frogs from six different locations in the Midwest[4]. It is not hard to imagine that both these effects could significantly impair the ability of these frogs to breed.

Maize is grown extensively in the US, particularly in the Midwest, where atrazine usage is so heavy that concentrations in rainwater can exceed 40 µg/litre[5]. Even in areas where atrazine is used infrequently it has been detected in rainwater at 1 µg/litre. Most atrazine is applied in the spring and consequently is most concentrated in rainwater at this time. This is also the time when tadpoles are developing and so is the most sensitive time for frog populations.

Use of atrazine in the UK is considerably less than in the US. However, it increased from 24,120 spray hectares in 1989, to 109,602 spray hectares in 1997[6]. The Environment Agency regularly monitors the concentrations of pesticides in rivers. They have a number of test sites distributed throughout England and Wales and in addition have designed a computer-modelling programme Prediction of Pesticides Pollution in the Environment (POPPIE), which can predict likely concentrations for different catchment areas. In response to this new study they have reanalysed their monitoring data for spring 2000, the time when tadpoles are developing. They have found concentrations of atrazine exceeding 0.1 µg/litre at 10 sites. In addition, POPPIE modelling predicts concentrations exceeding 0.1 µg/litre at an additional 13 sites. While frogs prefer to breed in still waters such as ponds, the levels in rivers may be indicative of the concentrations that could be found at breeding sites.

Amphibian populations have been declining worldwide and the UK is no exception. There are likely to be many different factors influencing this decline including disease and climate change. This study presents us with compelling evidence that use of herbicides such as atrazine could be contributing to this decline.

Atrazine use is currently being reviewed by the EU. The Pesticide Action Network are alarmed at the implications of this study. We call upon the EU to carefully consider these new data and to ban the use of atrazine in Europe.

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1. Hayes, T.B., Collins, A.C., Lee, M., Mendoza, M., Noriega, N., Stuart, A.A. and Vonk, A. (2002) Hermaphroditic, demasculinized frogs after exposure to the herbicide atrazine at low ecologically relevant doses. *Proceedings of the National Academy of Sciences of the USA* **99(8):** 5476-5480.

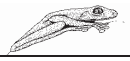
2. Cox, C. (2001) Atrazine, Global Pesticide. *Campaigner* **11(3):** 18-25.

3. Cox, Ibid.

4. Dalton, R. (2002) Frogs put in the gender blender by America's favorite herbicide, *Nature* **416:** 665-666.

5. Dalton, Ibid.

6. Anon (1997) *Pesticides Usage Survey Report, Grassland and Fodder Crops, Number 151.* Ministry of Agriculture, Fisheries and Food and Scottish Office Agriculture, Environment and Fisheries Department.



Froglog Shorts

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Testing Amphibians for Chytridiomycosis
The DAPTF has received two sets of notes concerning methods currently available for testing amphibians for the presence of the chytrid fungus. These have been provided by Alex Hyatt (Australia) and Pisces Molecular (USA). Both can be accessed from the front page of our web site:
www.open.ac.uk/daptf
If you require a paper copy, contact John Wilkinson, DAPTF Coordinator, at the address at the end of this *Froglog*.

The 2003 annual meeting for the Declining Amphibian Populations Task Force - CA/NV Working Group will be held on Friday, January 10, at California State University, Sacramento. For further details, Please contact David Bradford:
Bradford.David@epamail.epa.gov

For a report on the threats facing Canada's National Wildlife Areas, visit:
www.cnf.ca

The 8th Nordic Herpetological Symposium will be held in Lund (Sweden) during 24 - 26 July 2003. For more details please visit:
http://www.biologi.uio.no/foreninger/nfhf

The online reprint request page of the Division of Amphibians and Reptiles at the Field Museum has been updated, and several new titles have been added. Please visit our site at:
http://www.fmnh.org/research_collections/zoology/aandr_reprints.htm

The Ohio EPA headwater stream assessment project have updated their assessment manual, and posted new technical reports on headwater fish and salamanders. For more information contact Robert Davic at:
robert.davic@epa.state.oh.us or via phone (330) 963-1132. This is probably the first attempt in the USA to use the larval period of stream salamanders to suggest aquatic life use designations under the Clean Water Act - thus the approach has potential to be adapted for use in other global ecoregions where headwater stream salamanders are the dominant vertebrate predator functional group. The fish and salamander technical report is at:
http://www.epa.state.oh.us/dsw/wqs/headwaters/TechRep_FishAmphibian_2002.pdf
The 2002 updated headwater stream assessment manual is at:
http://www.epa.state.oh.us/dsw/wqs/headwaters/PHWHManual_2002_102402.pdf

Danube Biosphere Reserve Under Threat News has emerged that Ukrainian President Leonid Kuchma is being urged to withdraw protection from 5,600 ha of the Danube Biosphere Reserve so that it can be used for the construction of a ship canal and cargo loading facilities. This extensive wetland reserve is located in the Ukrainian part of the Danube Delta and was awarded its international biosphere reserve certificate by UNESCO in 1999. It is also a Ramsar site. More details can be found at:
www.seu.ru/projects/eng/dunay
The names and contact addresses of persons to whom your concerns can be expressed can be found on the website.

***Publications of Interest:* Space in *Froglog* is limited and we are no longer able to list all the new publications that are appearing at a steadily increasing rate. *Publications of Interest,* updated monthly, can now be viewed on our website. Please visit:**
***http://www.open.ac.uk/daptf/index.htm* and follow the link to Latest News!**

Instructions for Contributors

Froglog welcomes short contributions (500-1000 words) on any research, discoveries or conservation news relating to the amphibian decline phenomenon. Success stories as well as tales of impending disaster are sought! We encourage authors describing original research to first make submissions to a fully-refereed journal and then, if appropriate, to publish a precis or synopsis in *Froglog.*

Please submit potential contributions to John Wilkinson at the main office address below. E-mail submissions are encouraged (**DAPTF@open.ac.uk**). In order to speed your article into print, please, if possible, make your submissions SINGLE spaced and use the font Arial 9-point. Refer to this or any recent issue of *Froglog* for format, and please note the preferred format of any references cited!

RANA and the US National Science Foundation grant DEB-0130273 helped support the publication of this issue.

FROGLOG is the bi-monthly newsletter of the Declining Amphibian Populations Task Force.

Articles on any subject relevant to the understanding of amphibian declines should be sent to:

John W. Wilkinson, Editor, Department of Biological Sciences, The Open University, Walton Hall, Milton Keynes, MK7 6AA, U.K.
Tel: +44 (0) 1908 - 652274.
Fax: +44 (0) 1908 - 654167
E-mail: **daptf@open.ac.uk**

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