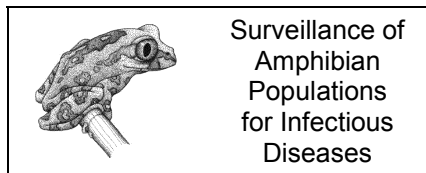


FROGLOG

Newsletter of the Declining Amphibian
Populations Task Force

February 2001, Number 43.



Surveillance of
Amphibian
Populations
for Infectious
Diseases

By Rick Speare, Diana
Mendez, Lee Berger
& Alex Hyatt

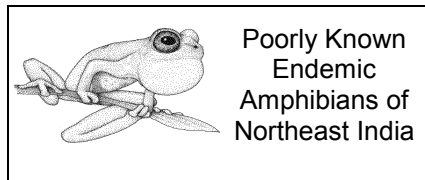
Amphibian populations globally are under threat from two emerging infectious diseases, chytridiomycosis and ranaviral disease. Surveillance of these two diseases is essential. Effective surveillance of an infectious disease is defined as: collection, collation, analysis, and interpretation of disease specific data, with timely dissemination of these data to those who need to know to allow action to limit or decrease the impact of the disease. The Amphibian Disease Network, established in Australia, has potential to become a highly effective surveillance system for amphibian disease worldwide. The focus to date has been on collection, collation, analysis and interpretation of data on chytridiomycosis, with dissemination of the data via the World Wide Web at the Amphibian Diseases Home Page <http://www.jcu.edu.au/school/phtm/PHTM/frogs/ampdis.htm>

We encourage frog disease researchers to send in survey results on chytridiomycosis for inclusion in the database. Amphibian species, location and dates are presented with the names of the submitters.

In the past, collection of data was simplified due to its being generated from a limited number of sources, all of which were fully integrated into the surveillance system. However, a major challenge facing this surveillance system is multiple sources of data as more scientists gain expertise in diagnosis of chytridiomycosis. This will result in data not being captured by the surveillance system. Strategies need to be devised to allow data from all sources to be captured. The concern of some researchers that prompt

dissemination of their locality and host records will lessen their academic value may be addressed by clearly linking surveillance data with the source, and acceptance in academic circles that, by participating in the surveillance system, scientists are making a significant contribution to effective management of amphibian populations and that this does not detract from their academic activities. The volume of data has also increased markedly. Automated procedures to allow more efficient collation of data are needed, as well as modifications to the way data are presented on the WWW. To address these challenges a web-based database of cases of chytridiomycosis that can be queried will be implemented in the latter part of 2000. Rapid dissemination of data can be achieved via email discussion groups such as FrogNet and ProMED, a global email list for emerging infectious diseases, and via a specific one-way mailing list that will be established for the purpose. Ongoing funding support is needed to allow the surveillance system to function effectively and to be expanded to include other amphibian diseases.

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Poorly Known
Endemic
Amphibians of
Northeast India

By Md. Firoz Ahmed

Amphibians are one of the poorly studied groups of fauna of northeast India. A systematic study on amphibians in this biodiversity hotspot was initiated by G A Boulenger (1890), followed by Annandale's work (1912,

1915). Chanda (1994) reported 54 species of anurans from the region.

Out of 216 species of amphibians occurring in India, as many as 20 species are endemic to this region. While ten of them are known only from original description, including a caecilian. Very little is known about these species which were described in the beginning of the last century. Those ten species are - *Pedostibes kempi* (Boulenger 1919), *Chirixalus simus* Annandale 1915, *Philautus argus* (Boulenger 1912), *Philautus garo* (Boulenger 1919), *Philautus kempiae* (Boulenger 1919), *Rhacophorus naso* Annandale 1912, *Limnonectes khasiensis* (Anderson 1871), *Rana garoensis* Boulenger 1920, *Phrynoglossus borealis* (Annandale 1912) among the anurans and *Gegenophis fulleri* (Alcock 1904), a monotypic caecilian.

Amongst these ten species 3 are Critically Endangered, 3 are Endangered, 1 is Vulnerable, 2 are Data Deficient and 1 (*P. argus*) is not evaluated (BCPP CAMP Report 1998). However only three of them are included in Schedule-IV of the Indian Wildlife (Protection) Act, 1972 and none have been assigned CITES categories.

Currently, a study on the assessment of the current status of these ten endemic and poorly known species is being carried out with financial assistance from the Smithsonian Institution as a Trainee's Fellowship of the Wildlife Conservation and Management Training Program. The study is expected to assess the present status, collect data on hitherto unknown habits and habitats and result in additional voucher specimens for further study.

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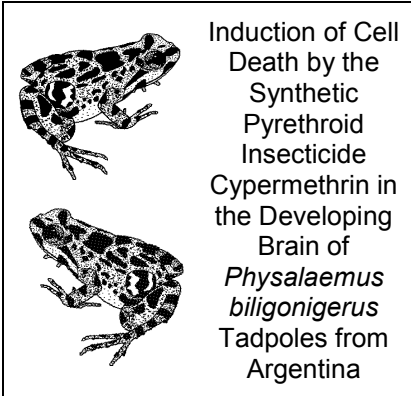
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Induction of Cell Death by the Synthetic Pyrethroid Insecticide Cypermethrin in the Developing Brain of *Physalaemus biligonigerus* Tadpoles from Argentina

By M.F. Izaguirre, R.C. Lajmanovich, P.M. Peltzer, A. Peralta Soler & V.H. Casco

Pesticide pollution is considered an important factor in the decline of amphibian populations observed in agricultural regions. Pyrethroid insecticides are synthetic molecules structurally related to natural pyrethrins. They have become increasingly popular for insect control in land and aquatic agricultural systems. Although pyrethroids are considered relatively nontoxic to bird and mammals they are extremely toxic to aquatic organisms, including fish and invertebrates. The broad-spectrum insecticide activity of pyrethroids is likely to be the result of alterations in ion conductance of nerve cell membranes. Cypermethrin (RS- α -cyano-3-phenoxycarbonyl-1RS-cis-, trans-3-2,2-dichlorovinyl-2,2-dimethylcyclopropane carboxylate) is a highly active synthetic pyrethroid insecticide. Because of its effectiveness against a wide range of arthropods, cypermethrin is routinely used, not only in agriculture, but also in the control of human head lice and animal external parasite infestations.

Undifferentiated neural cells of the developing brain of amphibians are highly vulnerable to toxins. However, the mechanisms and extent of tissue damage induced by insecticides in amphibians are poorly understood. We studied the effect of cypermethrin in the brain, eye and skin of *Physalaemus biligonigerus* tadpoles. *Physalaemus biligonigerus* tadpoles live in streams and

temporary ponds of the Paraná River floodplain, in the Northeast of Argentina, a region that sustains high levels of pesticide application.

Our experiments showed that the toxic effects of cypermethrin on *Physalaemus biligonigerus* tadpoles are specific to the developing nervous tissue. Treatment with cypermethrin induced programmed cell death (apoptosis) in developing neurons of brain and eye of *Physalaemus biligonigerus* tadpoles. In contrast, skin cells were not affected, even at high doses of the insecticide. The death of telencephalic neurons had typical features of programmed cell death (apoptosis), as determined by the TUNEL assay and by light and electron microscopic morphology. These results, to our knowledge, are the first to show that neurons of anuran larvae are selective targets for apoptotic cell death induced by a pyrethroid insecticide.

Our study indicates that native populations of *Physalaemus biligonigerus* tadpoles can be severely affected by the application of low concentrations of cypermethrin. The cell death of selective populations of neurons induced by sub-lethal doses of cypermethrin could alter reproductive and behavioral patterns required for amphibian survival. Estimations of cypermethrin degradation in experiments using cypermethrin as a field spray showed that the concentration of cypermethrin in stagnated waters could reach levels much higher than those used in our experiments in the laboratory.

Although fish are very sensitive to pyrethroid toxicity, the large density of tadpole habitats in temporary ponds in Northeast Argentina makes the amphibians more vulnerable to pyrethroid toxicity than lotic fish. We propose that the viability of *Physalaemus biligonigerus* tadpole populations is a sensitive indicator of the toxic effects of pyrethroid insecticides. The development of alternative methods of insect control in this region should be designed to include the preservation of native amphibian populations.

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Initiatives by the Canadian Amphibian and Reptile Conservation Network (CARCNET)/ Réseau Canadien de Conservation des Amphibiens et des Reptiles (RRCAR) in 1999-2000

by Christine Bishop, Chairperson CARCNET/RCCAR

Digital Frog International and CARCNET/RCCAR Offer Scholarship for Amphibian Conservation Research

We were very pleased to establish a partnership with Digital Frog International to offer a Scholarship for amphibian conservation research at the University of Guelph. This scholarship is being conferred upon students of the University of Guelph in recognition of the help and contribution provided by Dr. Jim Bogart to Digital International as they developed their computer software on the anatomy and ecology of amphibians. This \$500 annual scholarship will be awarded annually and students wishing to apply can read the application guidelines on our CARCNET/RCCAR web site or on the Digital Frog International web site.

New Report on Conservation Priorities for Amphibians and Reptiles in Canada

Funding from the World Wildlife Fund (WWF) allowed CARCNET/RCCAR to publish a joint report on 'Conservation Priorities for Amphibians and Reptiles' by David Seburn and Carolyn Seburn. This report describes the practical conservation actions needed to help both common and nationally-listed species at risk among the amphibians and reptiles. This was available at our annual meeting in Penticton, British Columbia in Sept 2000 and was launched at two press conferences, one at the Toronto Zoo, and the other at the Vancouver Aquarium on 29th Sept. It will be distributed to government and non-government organizations throughout Canada. It is a blueprint for conservation actions that we hope will help further the cause of herp conservation. If you would like copies of this report, please send your name and mailing address to Cathy Merriman at the WWF: cmerriman@wwfcanada.org

Important Amphibian Areas and Important Reptile Areas (IMPARA) project

Funding from the WWF also helped CARCNET/RCCAR to initiate the Important Amphibian Areas and Important Reptile Areas (IMPARA) project. We think that a national organization such as CARCNET/RCCAR must work to raise awareness about sites that are particularly significant and sensitive for herps in Canada. Dave Cunnington and Kevin Judge developed criteria for recognizing critical habitats for herptofauna. To date, two sites: Pelee Island in Ontario and the south Okanagan valley in British Columbia, have been recognized as important. The information on the program and how to nominate a site is on our web site at: <http://eqb-dqe.cciw.ca/partners/carcnet/intro.html>

Check Out The New Features on Our Web Site!

The new website is: <http://eqb-dqe.cciw.ca/partners/carcnet/intro.html> Thanks to the cooperative and supportive staff at the Ecological Monitoring and Assessment Network (EMAN) with Environment Canada our web site has a new look, a new URL, and is being translated into French, and has new features including information on legislation that protects amphibians and reptiles in each province, a registry of amphibian and reptile conservation projects in Canada, information on amphibians as bait, and amphibian and reptile tunnels.

CARCNET /RCCAR receives a \$30,000 contribution from the Habitat Stewardship Fund for the protection of habitat for snakes on Pelee Island

CARCNET/RCCAR has secured \$30,000 from Environment Canada's Habitat Stewardship Fund for the Wilds of Pelee Island Outdoor Conservation Centre. This is a long-term project initiated by Ben Porchuk to create and enhance habitat for snakes and other endangered species on Pelee Island and educate the public about snakes that occur on the island (Blue Racer (*Coluber constrictor*), Eastern Fox Snake (*Elaphe gloydi*), Lake Erie Water Snake (*Nerodia sipedon insularum*). The objectives of the Wilds of Pelee Island Outdoor Conservation Centre project are:

-To help firmly establish an independent "Outdoor Conservation Centre" to educate school and special interest groups about the importance of the conservation of natural resources, endangered species and

habitat preservation, and independent homesteading (renewable energies, etc.)

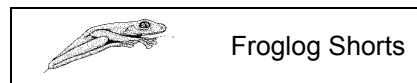
-To rehabilitate the 30 acres of tiled farmland (former wetlands) to a mosaic of wetlands, tallgrass prairie and savanna, thus providing habitat for nearly a dozen endangered species.

□To continue the monitoring of the populations of three large threatened or endangered snakes: the Blue Racer, the Lake Erie water snake and the Eastern Fox Snake.

-To create critical microhabitats for snakes and birds within the newly rehabilitated farmland, including an extensive hibernating complex and large nesting structures for the island's three endangered snakes

-To create an annual fund-raising event, "Endangered Species Festival - Stewardship and Pride", that would feature three days of 'open forum' recovery team meetings for several of southern Canada's endangered species, followed by three days of plant and animal celebratory family events.

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Froglog Shorts

PRESS RELEASE: U.S. SUPREME COURT RULING A SERIOUS BLOW TO FROGS. United States Declining Amphibian Populations Task Force, January 12, 2001.

The recent U.S. Supreme Court decision that limited the scope of the federal Clean Water Act is expected to greatly accelerate amphibian declines, unless remedies are quickly enacted. The federal ruling is doubly harmful in that some state wetlands regulations are dependent upon federal jurisdiction, so the ruling effectively eliminates many state protections as well. In Wisconsin, state officials estimate that the ruling will eliminate protections for up to 80% of the state's wetlands, by depriving the state of jurisdiction over the kind of wetlands involved in the decision - isolated wetlands not located adjacent to rivers, streams or other navigable waters. It is therefore considered one of the greatest blows to wetland protection in the last 20 years. The United States Declining Amphibian Populations Task Force calls for immediate federal and state action to prevent a surge of unregulated wetland development by preserving the status quo until jurisdictional

authority can be re-instated. Loss of these small wetlands can completely eliminate entire populations of frogs and salamanders for up to a mile away from the wetland itself, as these creatures are dependant upon these wetland types for breeding.

For further information and/or a full copy of this press release, please contact: Gary S Casper gsc@mpm.edu or Michael J Lannoo mlannoo@gw.bsu.edu

There are new Working Group Chairs for the CIS subregional group for Kazakhstan & Middle Asia, and for Portugal.

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The 11th Ordinary General Meeting of the Societas Europaea Herpetologia will be held in Zalec, Slovenia from 13-17 July, 2001. For information on registration and details of making a contribution, please visit the website:

www.zalec.si/radoziv/biota.ogmseh

DONATIONS We gratefully acknowledge receipt of the following donations received 1 November 2000 to 16 January 2001. Kraig Adler, James Andrews, Thomas Bartlett, Aaron Bauer, Ronald Beiswenger, Gale Belinky, R Bruce Bury, Alvin Braswell, Marc Brodtkin, Robert Brooks, Janalee Caldwell, Gary Casper, James Collins, Charlotte Corkran, Martha Crump, Norm Damm, Phillip Demaynadier, C. Kenneth Dodd Jr., Roger Downie, Arther Echtenacht, Evan Evans, Paulette Louise Ford, James Fowler, Katherine Fite, Terry Gampper, Nicole Gerlanc, Leigh Gillet & the Canterbury Branch of the Kent Wildlife Trust, James Gillingham, George Gorman, James Grizzell, Robert Gunderman, Carol Hall, Judith Hancock, Paula Henry, W. Ronald Heyer, Eugene Holmes, Moira Hope, Peter Hovingh, Jett, Robin Jung, Jeffrey Lang, Pamela Lanigan, Charlotte Latier, Charles Leavell, Lauren Livo, Gregory Linder, Pamela Lopez, Giles Mead Jr., Kendrick Moholt, John McGrath, Mayilin Ortt, Ralph Pflugsten, Edwin Pister, Belinda Porter, Harvey Pough, David Rich, Richard Ross, Douglas Rossman, Ingo Schlupp, John Serrao, Owen Sexton, Andrew Sheldon, Robert

Storm, Edward Styskel, Robert Mills Tandy, Heather Brooke Taylor, David Wake, Roger Waldman, Richard Wassersug, Kentwood Wells, Kirwin Werner, Yehudah Werner, Stevie Whitman and Ruth Willey.

DAPTF Seed Grants 2000/1

Our latest Seed Grant round has yielded no less than 47 applications, our best response to date. Most gratifyingly, we received applications from 26 different countries, from all parts of the world; our efforts to widen our activities internationally seem to be bearing fruit.

Tim Halliday

Conservation News

News items from GREENLines, newsletter of The Endangered Species Coalition, and HerpDigest, compiled by Allen Salzberg

-An annual frog census along Arizona's Aravaipa Canyon, covering 7 species, recorded 2385 frogs in 1978, 1040 in 1979, and 3 in 2000.

-The endangered Wyoming toad (*Bufo hemiophrys baxteri*) is reported to be primarily dependent on artificial wetlands associated with irrigation systems, only 10% of its remaining habitat being natural wetland.

-A federally-funded study has concluded that introduced trout are responsible for the demise of the mountain yellow-legged frog (*Rana muscosa*) in 90% of its range.

-North American bullfrogs (*Rana catesbeiana*) have invaded and bred in Britain; 7000 tadpoles and juveniles have been removed from a pond in east Sussex.

-Jefferson's salamander (*Ambystoma jeffersonianum*) has been added to Canada's list of Species at Risk.

-The US Nature Conservancy has purchased a 525 acre ranch in Nevada's Oasis Valley to preserve habitat vital for several species, including the Amargosa toad (*Bufo nelsoni*).

-Five million acres in California have been designated as federal habitat to protect the red-legged frog (*Rana aurora*).

-Police in Russia's Far East have detained nine people, suspected of killing and drying large numbers of frogs for export to China.

-Southern California's mountain yellow-legged frog (*Rana muscosa*) is reported to have only 100 surviving individuals.

-A US government report reports that, in the decade 1986 to 1997, wetland habitat in the USA by 80%, a slower rate than in previous decades.

DAPTF Responds to Crisis in Peru

We have received reports of mass mortalities among frogs at high

altitude localities in Peru; the chytrid fungus is strongly implicated. We are arranging for a grant from the DAPTF Rapid Response Fund to be sent to researchers in Peru, so that they can collect specimens and send them to disease experts in the USA and Australia.

Tim Halliday

The DAPTF website (www.open.ac.uk/daptf/) is about to be updated! Please let John Wilkinson know if your Working Group has a website, or is associated with an organization which has a website, and you would like a link creating to it.



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