
FROGS: A CHORUS OF COLORS **RETURNS TO THE AMERICAN MUSEUM OF NATURAL HISTORY**

CAPTIVATING EXHIBITION SHOWCASES MORE THAN 200 LIVE FROGS FROM AROUND THE WORLD

Back by popular demand, *Frogs: A Chorus of Colors*, is an engaging, fact-filled exhibition at the **American Museum of Natural History** that features more than 200 live frogs, including 9 species of colorful dart-poison frogs. On view from May 30, 2009, through January 3, 2010, the exhibition explores the colorful and diverse world of these complex amphibians by introducing visitors to their biology and evolution, their importance to ecosystems, and the threats they face in the wild.

Representing approximately 25 species from around the world, the frogs on display at the Museum range in size from tiny dart poison frogs, some less than one inch long, to the enormous African bullfrog, which can grow to be as big as eight inches in diameter. **New to the exhibition this year are Amazon milk frogs—named for the poisonous, white, milky secretion that this frog may produce when threatened; Borneo eared frogs—the females lay eggs in foam nests, created by beating a frothy secretion into foam with their hind legs, attached to branches overhanging the water; and long-nosed horned frogs, which are camouflaged to mimic leaves.** Each frog is shown in a re-creation of its natural habitat with realistic landscaping and natural materials. The exhibition also features the latest research findings about frogs, reflecting ongoing work by scientists in the Museum’s renowned Department of Herpetology and their colleagues. Also new to the exhibition is a five-minute video that introduces the global extinction crisis amphibians are currently undergoing. It discusses the threats amphibians face (habitat loss, pollution, climate change, over-collection, and emerging diseases) and focuses on the widespread chytrid fungus.

“We are very pleased to present a return engagement of *Frogs: A Chorus of Colors*,” said **Ellen V. Futter**, President of the American Museum of Natural History. “The overwhelming public response to *Frogs* when the Museum first presented it in 2004 was a clear signal that people are truly captivated by these charismatic and colorful animals. We hope that by engaging with these live creatures, children, adults, and families will learn about the extraordinary diversity of this group of animals, as well as their important roles within complex ecosystems and as environmental indicators.”

The centerpiece of the exhibition—a 110-cubic-foot dart-poison frog vivarium—showcases more than 70 dart-poison frogs. Dart-poison frogs are so named because the Emberá Chocó, an indigenous group from northwestern Colombia, rub their blow darts along the backs of the frogs. Dart-poison species concentrate toxins in the ants and other insects they eat into far more potent secretions—a single golden poison frog contains

enough poison to kill 20,000 mice or 10 humans. The frogs in the exhibition, which were bred in captivity, have been fed a diet that lacks poisonous compounds, making them harmless.

The vivarium enclosure is equipped with cameras placed at three different viewing stations that allow visitors to focus in on individual frogs. In addition, the enclosure includes a Web camera that enables virtual visitors from anywhere in the world to enjoy these colorful animals. A sound-scape featuring the calls of more than 20 species fills this area with some of the most unusual and bizarre vocalizations made by these amphibians.

Frogs also features a diverse array of species from around the world, including American and African bullfrogs, Chinese gliding frogs, ornate horned frogs, African clawed frogs, and fire-bellied toads (see full list below). Each is shown in a re-creation of its natural habitat, complete with rock ledges, live plants, and waterfalls. Interactive stations throughout the hall invite visitors to test their knowledge about frogs, study recorded frog calls, view videos of frogs in the wild, learn how a frog's anatomy allows it to out-jump Olympic athletes, and explore the stages of a frog's life cycle from egg to tadpole to full-grown adult. Information panels throughout the exhibition present a range of topics, including the ecological importance of frogs and the threats they face, efforts to conserve frogs around the world, and descriptions of frog behavior and morphology.

Frogs presents up-to-date information on frogs and other amphibians, much of which is derived directly and indirectly from the rich legacy of herpetological and evolutionary research at the Museum. Recent studies have shown that amphibians (of which frogs make up 88 percent) are on the decline worldwide. Nearly one-third of the world's amphibian species are threatened, compared to just 12 percent of birds and 23 percent of mammals. Moreover, at least 34 amphibian species are known to be extinct and as many as 130 more may also be gone. Of the threats facing these animals, habitat loss and degradation is by far the most severe, affecting nearly 4,000 species worldwide. Several Museum scientists recently contributed to a major reclassification of all 32 families and 5,500-plus species of frogs that sheds greater light on the evolution and diversity of frogs.

"Frogs have existed on Earth for more than 200 million years—at least since the time of the dinosaurs," said **Christopher J. Raxworthy**, lead curator of *Frogs*, Associate Curator in the Department of Herpetology, and Associate Dean of Science for Education and Exhibitions. "Thanks to ongoing research efforts, we are beginning to understand the crucial role frogs play in the environment and the nature of the threats they face. *Frogs: A Chorus of Colors* offers visitors a glimpse into the world of these singular animals, as well as the message they send to us about our stewardship of ecosystems around the globe."

This exhibition is presented with appreciation to Clyde Peeling's Reptiland.

All frogs displayed in the exhibition have been bred in captivity in order to protect wild populations.

Species Featured in *Frogs: A Chorus of Colors*

- **African bullfrogs** (*Pyxicephalus adspersus*) are native to sub-Saharan Africa and can grow to eight inches in length. During times of drought, they are able to live without food or water for months by burrowing underground and hibernating; when it rains, they re-emerge to eat and mate.

- **African clawed frogs** (*Xenopus laevis*) are almost completely aquatic and are found in stagnant pools, puddles, and streams. They originated in sub-Saharan Africa, but can now be found in freshwater habitats worldwide.
- **Amazon milk frogs** (*Trachycephalus resinifictrix*) breed in water-filled holes high in trees, and the male cares for the eggs after he fertilizes them. After they hatch, he will lure another female to the same hole to lay a second batch of eggs, which become food for the tadpoles.
- **American bullfrogs and tadpoles** (*Lithobates catesbeianus*) are found in ponds, lakes, and slow-moving streams throughout the U.S. The females lay 20,000 eggs at one time, and the tadpoles take up to two years to metamorphose. The bullfrog has a diverse diet, from crayfish and other frogs to small mammals and birds.
- **Borneo eared frogs** (*Polypedates otitophus*) are indigenous to Borneo, Sumatra, and other Indonesian islands. Females lay eggs in foam nests attached to branches overhanging the water. They create the nests by beating a frothy secretion into foam with their hind legs.
- **Chinese gliding frogs** (*Rhacophorus dennysi*) have enhanced webbing between their toes. When leaping between branches or escaping toward the ground, their toes spread and the webbing stretches like the wing of a glider. Their feet allow them to bank and steer through the air, and adhesive toe pads help them stick where they land.
- **Dart poison frogs** are found in Central and South America and are so-named because the Emberá Chocó people of northwestern Colombia poison their blow darts by coating them with secretions from the backs of three local and highly toxic species of frogs. The secretions are made toxic by chemicals in the frog's prey, primarily ants and beetles, and are remarkably potent—a single golden poison frog contains enough poison to kill 20,000 mice or 10 humans. The frogs in the exhibition, which were bred in captivity, have been fed a diet that lacks poisonous compounds, rendering them harmless. Nearly 100 individuals representing 12 species are housed in two separate enclosures.
- **Long-nosed horned frogs** (*Megophrys nasuta*), indigenous to the rainforests of Sumatra, Borneo, Indonesia, and Malaysia, are leaf mimics. Their pointed snouts, projections over their eyes, and ridged “veins” running down their backs help them disappear among the leaf litter on the forest floor.
- **Fire-bellied toads** (*Bombina orientalis*) are found in ponds, lakes, and rice paddies in Korea, northeastern China, and southeastern Russia. Their green and black backs serve as protective camouflage, while their bright orange bellies warn potential predators of toxic skin secretions.
- **Ornate horned frogs** (*Ceratophrys ornata*) live in grasslands and prairies in Uruguay, Brazil, and northern Argentina. They have voracious appetites, but are not built to chase prey. Instead, they bury themselves in loose soil and pounce on small animals that pass by.
- **Smokey jungle frogs** (*Leptodactylus pentadactylus*) are semiaquatic frogs with powerful thigh muscles. These frogs, found in Central and South America, are often used in gourmet cuisine.

- **Smooth-sided toads** (*Rhaebo guttatus*), native to northern South America, are one of the few toads (a subset of frogs) with smooth skin. They are active both day and night hunting for prey that includes mice, birds, snakes, and other frogs.
- **Vietnamese mossy frogs** (*Theloderma corticale*), from northern Vietnam, have spotty skin, bumps, spines, and tubercles that make them look like clumps of moss or lichen—camouflage that protects them from predators.
- **Waxy monkey frogs** (*Phyllomedusa sauvagii*), which live in the dry Gran Chaco region of Argentina, Paraguay, and Bolivia, seal in moisture by rubbing a waxy secretion all over their bodies. This keeps them from dehydrating in extremely hot temperatures.

Herpetology at the American Museum of Natural History

The American Museum of Natural History's **Department of Herpetology** was founded in 1909 as the Department of Ichthyology and Herpetology. **Mary C. Dickerson**, author of an influential introduction to the natural history of frogs (*The Frog Book*, Doubleday, 1906), formed the Museum's Herpetology Department as a separate entity ten years later, and it continues today as one of the world's foremost centers of research on reptiles and amphibians.

The Department's curators, researchers, and students maintain active programs in the classification and evolutionary study of reptiles and amphibians around the world, and in the theory and practice of determining the natural relationships among organisms, primarily through the study of lizards. Recent work by the Museum's herpetologists has yielded a number of significant advances, including a reorganization of all living amphibian species. They also maintain the Amphibian Species of the World database (<http://research.amnh.org/herpetology/amphibia>), a comprehensive, online catalog of the world's living amphibians that allows scientists around the world to keep track of rapid advances in global amphibian diversity.

The Museum's collection of amphibians and reptiles is one of the best-studied herpetological resources in the world and ranks among the world's five largest such collections. It currently includes more than 360,000 specimens representing more than 6,900 species (more than half the world's herpetological diversity) of frogs, toads, salamanders, alligators, crocodiles, lizards, snakes, and turtles, as well as other reptiles and amphibians, from Africa, Australia, China, Madagascar, Mexico, New Guinea, the Pacific Islands, Pakistan, Panama, South America, the United States, and Vietnam.

Along with the Department's collection and globe-spanning fieldwork, Museum herpetologists employ state-of-the-art research tools, including the 10,000-square-foot laboratory in the Museum's **Sackler Institute for Comparative Genomics**. Research in these laboratories is supported and enabled by a highly sophisticated parallel-computing facility with one of the fastest cluster supercomputers in the world. The Museum's frozen tissue collection, with a one-million-sample capacity, houses more than 10,000 herpetological tissue samples.

Curator Biographies

Christopher J. Raxworthy, Associate Curator, Department of Herpetology, Division of Vertebrate Zoology; Associate Dean of Science for Education and Exhibition, Lead Curator, *Frogs*

Christopher J. Raxworthy focuses on the classification and distribution of Old World reptiles and amphibians, particularly the family relationships among species of chameleons. His work has provided new insights into the process of species formation among Madagascar reptiles and has helped policymakers set priorities for conservation planning. When he began his research there 19 years ago, only about 370 species of reptiles and amphibians had been identified in Madagascar. Since then, he has helped find, and is now describing, more than 150 new species and has made significant contributions to the Global Amphibian Assessment for Madagascar. His chameleon systematics project includes field surveys in several remote, mountainous areas of northern Madagascar. Dr. Raxworthy also has conducted fieldwork in Ghana, Mali, Morocco, Senegal, Seychelles, Turkey, and Vietnam. Research based on Asian and African fieldwork is helping him search for historical links between frogs and reptiles from before Madagascar and India separated from the supercontinent Gondwana. Dr. Raxworthy received his Ph.D. in biology from the Open University, Milton Keynes, England, in 1989. He joined the Museum as Associate Curator in 2000.

Darrel R. Frost, Curator-in-Charge, Department of Herpetology, Division of Vertebrate Zoology; and Associate Dean of Science for Collections

As Associate Dean of Science for Collections, Darrel R. Frost is responsible for overseeing the use and maintenance of the American Museum of Natural History's permanent collection of more than 30 million specimens and cultural artifacts. Dr. Frost also oversees the Office of the Conservator of Natural Science Collections and the Interdepartmental Laboratory, which includes a state-of-the-art imaging facility that provides analytical microscopy, spectroscopy, visualization, and image analysis in support of the Museum's scientific activities. As a curator in the Division of Vertebrate Zoology, Dr. Frost studies the evolutionary origin and diversification of reptiles and amphibians and has formulated a revised classification for Iguania, the group of New World lizards comprising about 1,000 species in the Americas, Madagascar, Fiji, and Tonga. Dr. Frost recently spearheaded a collaborative study on the evolutionary history of all amphibians that has revised understanding of the world's 6,000-plus species of amphibians. He also maintains the Amphibian Species of the World database (<http://research.amnh.org/herpetology/amphibia>), a comprehensive, online catalogue of the world's living amphibians that allows scientists around the world to keep track of rapid advances in global amphibian diversity. Dr. Frost received his Ph.D. in systematics and ecology from the University of Kansas in 1988 and joined the American Museum of Natural History in 1990 as Assistant Curator. He is also Adjunct Professor at Columbia University and the City University of New York.

David Kizirian, Curatorial Associate, Department of Herpetology, Division of Vertebrate Zoology

David Kizirian is primarily responsible for the care of the Museum's collections of non-fossil amphibians and reptiles. His research interests include the species-level systematics and evolution of various groups of frogs,

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snakes, and lizards. Dr. Kizirian received his Ph.D. in Systematics and Ecology from the University of Kansas in 1994. He was a Coleman Postdoctoral Fellow in the Museum's Department of Herpetology in 1995 and worked in the Museum's Monell Molecular Laboratory from 1996 to 1998. From 1998 to 2003, he was Assistant Curator of Herpetology and Co-Director of the Molecular Systematics Program at the Natural History Museum of Los Angeles County. Dr. Kizirian joined the American Museum of Natural History in 2005 as Curatorial Associate and is also Adjunct Assistant Professor in Biological Sciences at Baruch College.

Exhibition Web Site at www.amnh.org

The Museum's website, www.amnh.org, features a link to the Web camera mounted above the dart-poison frog vivarium, an interview with Dr. Raxworthy, photographs of the frogs on view, interesting facts about frogs, listings of exhibition-related public programs at the Museum, curator biographies, and behind-the-scenes images documenting the construction and development of the exhibition. Visitors to the website can also purchase tickets online.

Hall of Reptiles and Amphibians

The **Hall of Reptiles and Amphibians**, located on the third floor of the Museum, offers visitors a wealth of information on frogs and other amphibians. Visitors can explore the fascinating world of these animals in exhibits organized along such themes as anatomy, defense, locomotion, distribution, reproduction, and feeding, and view the great range of these animals' physical forms, from the tiniest toad to the fearsome crocodile. Highlights in the Hall include an enlarged model of a female *Pipa pipa*, the Surinam toad of South America, carrying her young embedded in the skin of her back; a display featuring the diversity of frogs; and models illustrating the process of metamorphosis from egg to tadpole to frog.

Frogs Featured throughout the Museum's Permanent Halls

Elements of frog biology, as well as cultural representations of these popular amphibians, can be found in a number of other areas throughout the Museum, including the Museum's interactive Discovery Room. Located on the first floor near the Grand Gallery and 77th Street entrance, the **Discovery Room** offers visitors of all ages the opportunity to learn more about frogs through a range of displays and hands-on activities with live wood frog and bullfrog tadpoles, and adult tree frogs and wood frogs. Visitors can also explore a variety of books on frogs, ranging from biology texts to folklore, and view slide shows of frogs in their natural habitats. The Discovery Room is open during the summer from 10:30 am to 1:30 pm and 2:15 to 5:10 pm, and after Labor Day from 1:30 to 5:10 pm.

Frogs are prominently featured in the **Hall of Biodiversity**, located on the first floor, as models in the diorama of the Central African Republic's Dzanga-Sangha rain forest and in the Spectrum of Life, which showcases the glorious diversity of life through a grand assemblage of more than 1,500 specimens and models—including insects, plants, fish, and mammals—and is mounted in a 100-foot-long installation along one wall and extending out overhead.

Frogs are also widely represented in the **Hall of Northwest Coast Indians**, located on the first floor, which features artifacts such as hats, figures, pipes, bracelets, hammers, and charms that are adorned with frog imagery and carvings, and in the **Stout Hall of Asian Peoples**, located on the second floor, which showcases a magnificent two-foot-high kite in the shape of a frog and an intricately designed ivory statuette that features several frogs perched on a lotus plant.

Retail

Visitors can also explore the **Frogs Shop** located on the first floor of the Main Shop, just outside the exit to **Frogs**. The Shop features a wide selection of whimsical frog-themed merchandise, including an assortment of bath accessories, novelty toys, and stationery, as well as a collection of educational and scientific books.

American Museum of Natural History

The American Museum of Natural History is one of the world's preeminent scientific, educational, and cultural institutions. Since its founding in 1869, the Museum has advanced its global mission to explore and interpret human cultures and the natural world through a wide-reaching program of scientific research, education, and exhibitions. The Museum accomplishes this ambitious goal through its extensive facilities and resources. The institution houses 46 permanent exhibition halls, state-of-the-art research laboratories, one of the largest natural history libraries in the Western Hemisphere, and a permanent collection of more than 30 million specimens and cultural artifacts. With a scientific staff of more than 200, the Museum supports research divisions in Anthropology, Paleontology, Invertebrate and Vertebrate Zoology, and the Physical Sciences. The Museum shares its treasures and discoveries with approximately four million on-site visitors from around the world each year. AMNH-produced exhibitions and Space Shows can currently be seen in venues on five continents reaching an audience of millions. In addition, the Museum's website, www.amnh.org, extends its collections, exhibitions, and educational programs to millions more beyond the Museum's walls.

At the American Museum of Natural History

The Museum offers a broad array of activities for adults, children, families, students, educators, and scientists. These range from special exhibitions to symposia, lecture series, workshops, and film festivals. Highlights include ***Extreme Mammals: The Biggest, Smallest, and Most Amazing Mammals of All Time*** (May 16, 2009–January 3, 2010), an intriguing exhibition exploring the surprising and sometimes bizarre world of extinct and living mammals; ***Climate Change: The Threat to Life and A New Energy Future*** (October 18, 2009–August 16, 2009) an exhibition examining one of the most complex and urgent scientific and social issues of the 21st century: global climate change; ***On Feathered Wings*** (June 21, 2008–August 30, 2009), an exhibition of over 30 striking photographs featuring dramatic images of birds in flight; ***Saturn: Images from the Cassini-Huygens Mission*** (April 26, 2008–July 26, 2009), an exhibition of over 50 spectacular photographs captured by NASA's *Cassini* orbiter and the European Space Agency's *Huygens* lander; ***Vital Variety: A***

Visual Celebration of Invertebrate Biodiversity (ongoing), an exhibition of 23 large-format color photographs highlighting the importance of the immense diversity of invertebrates; the Hayden Planetarium Space Show, *Cosmic Collisions*, narrated by Robert Redford; *Sonic Vision* (shown Friday and Saturday evenings), the dazzling digitally animated alternative music show in the Hayden Planetarium, with a mix by Moby; and *One Step Beyond*, the popular ongoing monthly party series where guests can dance in the Museum's Cullman Hall of the Universe to sets by the biggest names in techno, electronica, hip-hop, and indie rock.

Hours

The Museum is open daily, 10 am–5:45 pm
The Museum is closed Thanksgiving and Christmas.

Space Show and *Sonic Vision* Hours

The Space Show is shown every half hour Sunday–Thursday and Saturday, 10:30 am–4:30 pm, and Friday, 10:30 am–7 pm. *Sonic Vision* is shown Fridays and Saturdays at 7:30 and 8:30 pm.

Admission

Suggested general admission, which supports the Museum's scientific and educational endeavors and includes 46 Museum halls and the Rose Center for Earth and Space, is \$15 (adults) suggested, \$11 (students/seniors) suggested, \$8.50 (children) suggested. All prices are subject to change.

The Museum offers discounted combination ticket prices that include suggested general admission plus special exhibitions, IMAX films, and Space Shows.

- Museum plus special exhibition, IMAX film, or Space Show: \$24 (adults), \$18 (students/seniors), \$14 (children)
- Museum Supersaver (includes Space Show, IMAX, and all special exhibitions): \$32 (adults), \$24.50 (students/seniors), \$20 (children)

Visitors who wish to pay less than the suggested Museum admission and also want to attend a special exhibition, IMAX film, or Space Show, may do so only on-site at the Museum. To the amount they wish to pay for general admission, they should add \$20 (adults), \$16.50 (students/seniors), or \$11 (children).

Public Information

For additional information, the public may call 212-769-5100 or visit the Museum's website at www.amnh.org.

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