



AMERICAN MUSEUM OF NATURAL HISTORY

Media Inquiries: Laura Bedrossian, Department of Communications
212-769-5973; lbedrossian@amnh.org
www.amnh.org

March 2015

***LIFE AT THE LIMITS: STORIES OF AMAZING SPECIES* OPENS AT THE AMERICAN MUSEUM OF NATURAL HISTORY**

**NEW EXHIBITION SHOWCASES VARIETY OF ‘SUPERPOWERS’ ORGANISMS USE
TO SURVIVE AND THRIVE ON EARTH
FROM APRIL 4, 2015, TO JANUARY 3, 2016**

Holding your breath for up to two hours. Gulping down a snack 10 times your own weight. Living in crushing depths where there is no sunlight to support life. These may sound like superpowers to humans, but somewhere on this planet, an organism is using one of these extraordinary talents to go about its daily tasks. *Life at the Limits: Stories of Amazing Species*, a new exhibition opening April 4 at the American Museum of Natural History in the LeFrak Family Gallery, offers a fascinating glimpse of the breathtaking diversity of the natural world and the power of natural selection to shape exceptional responses to the challenges, and opportunities, of life on Earth.

“While the Museum in its entirety showcases the glorious diversity of life on Earth, this exhibition shines a special light on some of the most unusual, extreme, and truly bizarre creatures, and their ingenious adaptations to unusually challenging habitats and environments,” said Ellen V. Futter, President of the American Museum of Natural History. “The extraordinary and amazing species showcased in *Life at the Limits* are manifestations of the great story of evolution and, as such, offer powerful and inspiring testament to the persistence and tenacity of life on Earth.”

Featuring life-size and larger-than-life models, several species of live animals, videos, and interactive exhibits, *Life at the Limits* highlights an array of organisms with surprising ways of thriving in harsh environments, finding a mate or their next meal, leveraging strength, endurance, and speed, and more.

"The biosphere, a thin veneer blanketing the surface of Earth, comprises an enormous range of temperatures, pressures, and other physical challenges to all of the forms of life that compete for existence and endurance," said Mark Siddall co-curator of *Life at the Limits* and curator in the Museum's Division of Invertebrate Zoology. "As fascinating to me as is the myriad of ways species have solved the problems of survival and reproduction is the number of times Life has hit on similar solutions to the extremes of breathing, eating, defense, and even finding a mate. The history of Life is a story of tenacity; and it's written in the super-powers afforded by Natural Selection."

"As our ability to access and study more remote environments increases, scientists are continually discovering new organisms and even communities thriving in what appear to be some of the most inhospitable places – the deepest ocean trenches, surrounding deep sea thermal vents, at great depth within perpetually dark caves, and even within the polar ice sheets," said John Sparks, co-curator of *Life at the Limits* and curator in the Museum's Department of Ichthyology. "This exhibition highlights the challenges all organisms face in the struggle to find a mate and food, survive in different, often hostile, environments, avoid predation, and ultimately reproduce, and focuses on amazing species at the extreme physical and physiological limits of life. I never cease to be amazed by the wonders that natural selection can produce given enough time."

Showcasing the extraordinary range of the ways different organisms – plant and animal, aquatic and terrestrial, vertebrate and invertebrate – have become tailored to conditions on this planet, *Life at the Limits* will include:

- **Creative courtship and reproduction strategies**

Every living organism can bring new life into the world, but some go to extraordinary lengths to procreate. Corals, which live anchored to the sea floor, release billions of eggs and sperm in unison – a spectacular synchronized spawning event during a full moon that is recreated in the exhibition with an intricate model of a stretch of corals from Australia's **Great Barrier Reef**. Or *Rafflesia arnoldii* of the rainforests of Southeast Asia, which belong to a group of parasitic plants called **corpse flowers**. This plant has no stem, leaves, or roots and is barely visible when not in bloom. When it opens, it has the largest flower on the planet and emits a powerful odor of rotting meat to attract its pollinator of choice, carrion flies. Other species

invest heavily in courtship rituals. The male satin **bowerbird** (*Ptilonorhynchus violaceus*) builds an elaborate nest-like structure called a bower, which he decorates with flowers, shells, feathers, and other eye-catching baubles to attract females. Or consider the **Hercules beetle** (*Dynastes hercules*), the largest of the subfamily of rhinoceros beetles, **featured as a climbable model**. These buff beetles can carry up to 80 times their own weight, a skill males deploy while competing for mates.

- **Remarkable adaptations for breathing**

Many life forms on Earth thrive at high altitudes, where oxygen is scarce, and some have ways of accessing or storing oxygen in other types of extreme conditions. The southern **elephant seal** (*Mirounga leonina*), featured in the exhibition as a **20-foot life-size model**, can dive down nearly a mile and stay underwater for up to two hours while hunting, thanks to its high volume of blood and high levels of hemoglobin, the molecule that ferries oxygen throughout its body. Unlike most amphibians, which develop lungs as they move from water to land, the **axolotl** (*Ambystoma mexicanus*) retains its frilly external gills for its whole life, which it spends underwater. This unusual salamander, which is **featured live in the exhibition**, also has the ability to regrow limbs repeatedly and can even regenerate a crushed spinal cord.

- **Efficient ways of moving around**

Evolution has been shaping locomotion for millions of years – with fascinating results that match or even surpass human technologies. Take the slow-moving **nautilus** (*Nautilus pompilius*), which is featured **live** in one of the exhibition's aquariums. This marine animal moves using jet propulsion, shooting water out of its funnel (siphon), which propels it in the opposite direction. When it comes to flight, **dragonflies** have helicopters beat; they can hover motionless and fly upside down and backwards. But what's even more incredible is that when combined with their amazing vision, dragonflies have a midair capture rate of 95 percent.

- **Super sensing abilities**

From **Boreal owls** with extremely sharp hearing to **sea scallops** that can see in all directions, *Life at the Limits* tells the stories of the natural world's top eyes, noses, ears, and more. The **sawfish** (*Pristis pristis*) hunts with its long, flat snout, which is rimmed with sharp points that give it its signature look. The blade serves as both a weapon and a scanning device; its surface is speckled with sensitive pores that **detect weak electric fields produced by its prey**. Male saturniid moths find their mates by following females' scents, using their sensor-loaded antennae to gather specific aromas from the air. A gallery devoted to life inside caves showcases a variety of species, from **leeches that appear to have legs** (*Erpobdella mestrovi*) to **birds that echolocate like bats to find their way in the dark** (*Aerodramus fuciphagus*), that have adapted to low-light environments in similar ways.

- **Extreme hunting and eating**

Organisms have many ways of securing a meal, whether it's through expert hunting, making the most of a scarce snack, or finding a way to mooch off another's efforts. The peacock **mantis shrimp** (*Odontodactylus scyllarus*), **featured live** in the exhibition, packs a punch that accelerates like a .22 caliber bullet – enough to shatter shells and sometimes even aquarium glass. The **black swallower** (*Chiasmodon niger*) lives thousands of feet beneath the ocean's surface, where a good meal can be hard to find. This fish can gulp down prey 10 times its own weight thanks to large, extendable jaws and a stomach with greatly expandable walls, making the most of each feeding opportunity. Some parasites leave the hard work to others: the corpse flower (*Rafflesia arnoldii*), which is found in the rainforests of Southeast Asia, does not use photosynthesis to convert sunlight into nutrients but instead draws all of its nourishment from its host, a vine.

- **Extraordinary endurance**

Even in the harshest environments on Earth, life finds a way to thrive. A diorama of a **hydrothermal vent** deep in the ocean features **tube worms** (*Riftia pachyptila*), which survive in superheated seawater with high concentrations of acids, metals, and sulfur. The **world's toughest microbe**, the bacterium *Deinococcus radiodurans*, can survive over 1,000 times more radiation than a human can and withstand extreme cold, acids, and a vacuum.

- **Dramatic defense systems**

Predators can't hunt what they can't find, and some species have found ways to hide in the open. The **mimic octopus** (*Thaumoctopus mimicus*), can imitate a number of venomous and poisonous creatures, including a flatfish, a lionfish, and a sea snake, to fool its own predators. To mimic these animals, this octopus's skin creates colors and patterns like a video screen, and its boneless body takes on a variety of shapes. A model of a **treehopper** highlights this insect's odd protective gear: a structure on its backs that disguises this harmless critter as a vicious ant.

- **Death-defying feats**

Some species can seemingly defy death. Shown as 10-foot models, microscopic animals called **tardigrades** can survive dehydration, extreme temperatures, and even the radiation and vacuum of space. Lobsters have cells that don't age, so they grow and continue to reproduce their whole lives. And the African lungfish (*Protopterus dolloi*), which lives in shallow pools that are prone to drying, can survive for years without food or water by creating a special mud burrow.

- **Interactive section to test a variety of 'super powers'**

Visitors will get to meet and interact with some of the incredible creatures that they have encountered throughout the show. Through exploration of several virtual environments and the use of guided gestures **using whole-body, motion-sensing Microsoft Kinect technology**, visitors will cause creatures to behave in ways consistent with some of their amazing abilities, highlighting why these creatures live life at the limits.

The American Museum of Natural History gratefully acknowledges the **Richard and Karen LeFrak Exhibition and Education Fund**.

Generous support for *Life at the Limits* has been provided by the Eileen P. Bernard Exhibition Fund.

Life at the Limits is proudly supported by Chase Private Client.

AMERICAN MUSEUM OF NATURAL HISTORY (AMNH.ORG)

The American Museum of Natural History, founded in 1869, is one of the world's preeminent scientific, educational, and cultural institutions. The Museum encompasses 45 permanent exhibition halls, including the Rose Center for Earth and Space and the Hayden Planetarium, as well as galleries for temporary exhibitions. It is home to the Theodore Roosevelt Memorial, New York State's official memorial to its 33rd governor and the nation's 26th president, and a tribute to Roosevelt's enduring legacy of conservation. The Museum's five active research divisions and three cross-disciplinary centers support approximately 200 scientists, whose work draws on a world-class permanent collection of more than 33 million specimens and artifacts, as well as specialized collections for frozen tissue and genomic and astrophysical data, and one of the largest natural history libraries in the world. Through its Richard Gilder Graduate School, it is the only American museum authorized to grant the Ph.D. degree. In 2012, the Museum began offering a pilot Master of Arts in Teaching program with a specialization in Earth science, which is the only non-university affiliated such program in the United States. Annual attendance has grown to approximately 5 million, and the Museum's exhibitions and Space Shows can be seen in venues on five continents. The Museum's website and collection of apps for mobile devices extend its collections, exhibitions, and educational programs to millions more beyond its walls. Visit amnh.org for more information.

Hours

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

Admission

Museum admission is free to all New York City school and camp groups.

Suggested general admission, which supports the Museum's scientific and educational endeavors and offers access to the Museum's 45 halls including the Rose Center for Earth and Space, is \$22 (adults) suggested, \$17 (students/seniors) suggested, \$12.50 (children) suggested. All prices are subject to change.

The Museum offers discounted combination ticket prices that include suggested general admission plus special exhibitions, IMAX or 3D films, and Space Shows.

- Museum Plus One includes one special exhibition, IMAX or 3D film, or Space Show: \$27 (adults), \$22 (students/seniors), \$16 (children)
- Museum Supersaver includes all special exhibitions, IMAX or 3D film, and Space Show: \$35 (adults), \$28 (students/seniors), \$22 (children)

Visitors who wish to pay less than the suggested Museum admission and also purchase a ticket to attend a special exhibition, IMAX or 3D film, or Space Show may do so on-site at the Museum. To the amount they wish to pay for general admission, they add \$25 (adults), \$20.50 (students/seniors), or \$13.50 (children) for a Space Show, special exhibition, or IMAX or 3D film.

Public Information

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

Follow

Become a fan of the Museum on Facebook at facebook.com/naturalhistory, follow us on Instagram at [@AMNH](https://twitter.com/AMNH), Tumblr at [amnhnyc](https://amnhnyc.tumblr.com/) or visit twitter.com/AMNH to follow us on Twitter.

#