

140 new species described by California Academy of Sciences in 2011

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Gopherus morafkai is a new species of tortoise from Arizona and Mexico, one of 140 new species described by the California Academy of Sciences in 2011.
Credit: California Academy of Sciences

In 2011, researchers at the California Academy of Sciences added 140 new relatives to our family tree. The new species include 72 arthropods, 31 sea slugs, 13 fishes, 11 plants, nine sponges, three corals, and one reptile. They were described by more than a dozen Academy scientists along with several dozen international collaborators.

Proving that there are still plenty of places to explore and things to discover on Earth, the scientists made their finds over six continents (all except [Antarctica](#)) and three oceans (Atlantic, Pacific, and Indian), climbed to the tops of mountains and descended to the [bottom of the sea](#), looked in their own backyards (California) and on the other side of the

world (Cameroon). Their results, published in 33 different scientific papers, add to the record of [life on Earth](#) and help advance the Academy's research into two of the most important scientific questions of our time: "How did life evolve?" and "How will it persist?"

Discovering new species, formally describing them, and determining their [evolutionary relationships](#) to other [organisms](#) provide the crucial foundation for making informed conservation decisions at a national level. For example, earlier this year, Academy scientists embarked on the largest expedition in the institution's recent history—a 42-day journey to the Philippines to survey the shallow water, deep sea, and mountain habitats of Luzon Island. Early estimates indicate that they may have discovered as many as 500 new species. While it takes months and even years to formally describe and publish a new species in a peer-reviewed scientific journal (the reason they are not included in the 2011 total), Academy scientists had enough initial data to provide a formal recommendation to Conservation International and the Philippine government outlining the most important locations for establishing or expanding marine protected areas. Formal species descriptions in the coming years should help the scientists bolster and refine their initial recommendations.

Below are a few highlights among the 140 species described by the Academy this year. For a full list of species, including geographic information, visit http://www.calacademy.org/newsroom/releases/2011/new_species_list.php.

FOUR NEW SHARKS



Pristiophorus nancyae, or the African dwarf sawshark, is one of 140 new species described by the California Academy of Sciences in 2011. This specimen was collected at a depth of 1,600 feet off the coast of Mozambique. It is notable for its elongated blade-like snout, or “rostrum,” which is studded with sharp teeth and used as a weapon. The sawshark will swim through a school of fish swinging its rostrum back and forth, stunning and injuring prey, and then swim back to consume the casualties. Credit: California Academy of Sciences

Academy research associate David Ebert and his colleagues described four new species of deep-sea sharks this year. The African dwarf sawshark (*Pristiophorus nancyae*) was collected via a bottom trawl at a depth of 1,600 feet, off the coast of Mozambique. It is notable for its elongated blade-like snout, or "rostrum," which is studded with sharp teeth and used as a weapon. The sawshark will swim through a school of [fish](#) swinging its rostrum back and forth, stunning and injuring prey, and then swim back to consume the casualties. Ebert and his colleagues also described two species of lanternshark: *Etmopterus jounqi* from a fish market in Taiwan, and *Etmopterus sculptus* from trawling at depths of 1,500 - 3,000 feet off the coast of southern Africa. Like their name suggests, lanternsharks emit light on various parts of their body—probably a strategy to camouflage themselves from upward-looking predators and also to interact with others of their own species. Finally, a new species of angel shark (*Squatina caillieti*) was described from a single specimen collected in 1,200 feet of water off the Philippine island of Luzon. Angel sharks have flattened bodies and large

pectoral fins resembling wings.

A BOUNTY OF ARTHROPODS



Dermatobranchus leoni is a new species of sea slug, aka nudibranch, from the Philippines, one of 140 new species described by the California Academy of Sciences in 2011. Nudibranchs use their vivid colors to warn predators of their toxic or unpalatable nature. Credit: Constantinos Petrinos

There are more species of arthropods—insects, spiders, crustaceans, and other joint-legged creatures—than any other group of animals on Earth, and more are being discovered every day. So it's no surprise that over half of the new species on this year's list consists of arthropods: 43 ants, 20 goblin spiders, six barnacles, and three beetles. In addition, Academy scientists took it to the next level—literally—by describing six new genera ("genus" being one classification level higher than "species"). These include three new genera of goblin spiders from Africa (*Malagiella*, *Dalmasula*, *Molotra*) and three new genera of barnacles (*Minyaspis*, *Pycnaspis*, and the fossil *Archoxynaspis*).

GORGEOUS SEA SLUGS

Despite the common name of "sea slug," nudibranchs are breathtaking in

their beauty and diversity. Every color of the rainbow is represented among nudibranchs, in a wide variety of patterns, making them a favorite for underwater photographers. These animals use color as a warning sign—predators learn to associate their vivid colors with their toxic or unpalatable nature, and so they avoid eating them.

More than 3,000 nudibranch species have been discovered and described to date, and scientists estimate that another 3,000 species are yet to be named. Academy Dean of Science Terry Gosliner and his colleagues did their part to increase our knowledge of nudibranch diversity by describing 31 new species this year, from places as close as Florida to faraway countries like Papua New Guinea. (Email press@calacademy.org for access to the image gallery containing a selection of these colorful animals.)

A TALE OF TWO TORTOISES

In a *ZooKeys* article published this year, Academy curator emeritus Alan Leviton and colleagues, collaborating with Dr. Robert Murphy of the Royal Ontario Museum, solved the identity crisis of the desert tortoise *Gopherus agassizii*—a saga almost as old as the Academy itself. First, by sifting through the original species description in The Proceedings of the California Academy of Natural Sciences (as the Academy used to be called), they determined that the species was first described in 1861, not 1863 as had long been thought. Next, they deduced that one of the three original specimens used to describe the species was likely lost during the most devastating event in the Academy's history—the 1906 earthquake and fire. (A second specimen is currently housed at the Smithsonian, while the whereabouts of the third remain unknown.) Third, they reviewed the tumultuous taxonomic history of the species, which has changed its genus name five times in the past 150 years. Finally, using DNA analysis, they concluded that *G. agassizii* is not one, but at least two distinct species—one that lives to the northwest of the Colorado River in

California and Nevada (*G. agassizii*), and one that lives to the southeast of the river in Arizona and Mexico (a new [species](#), which they named *Gopherus morafkai*).

This newfound clarity has important implications for conservation, because the geographic range of *G. agassizii* is now only 30% of its former range. Having significantly declined in numbers over the past three decades, it may warrant a higher level of protection than its current "threatened" status. And now that *G. morafkai* has a distinct name and its own identity, its conservation status can be evaluated as well.

Provided by California Academy of Sciences

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