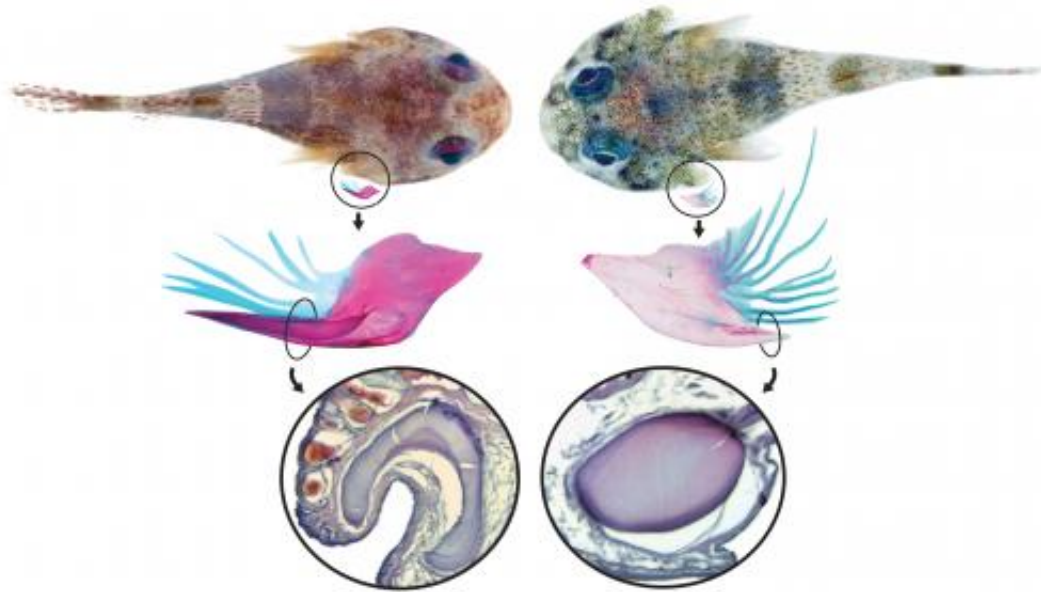


Researcher publishes clingfish discoveries

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A venomous (right) and non-venomous (left) Caribbean clingfish showing the differences in the subopercular bone. Credit: Texas A&M University photo courtesy Dr. Kevin Conway and Dr. Carole Baldwin, Smithsonian Institution

(Phys.org) —Sometimes we think we know everything about something only to find out we really don't, said a Texas A&M University scientist.

Dr. Kevin Conway, assistant professor and curator of fishes with Texas A&M's department of wildlife and fisheries sciences at College Station, has published a paper documenting a new [species](#) of clingfish and a startling new discovery in a second well-documented clingfish.

The paper, entitled "Cryptic Diversity and Venom Glands in Western Atlantic Clingfishes of the Genus *Acyrtus* (Teleostei: Gobiesocidae)," was published May 13 in the *PLOS ONE* online journal.

The scientific paper documents the study Conway and his team, including Dr. Carole Baldwin, his collaborator at the Smithsonian Institution, and Macaulay White, former Texas A&M undergraduate, have been working on for several years.

"We are excited about the study, because it resulted in not only the discovery of an undescribed species, but also the discovery of a unique venom gland in a group of fishes nobody knew were venomous," Conway said. "New groups of venomous fishes are not discovered very often, in fact the last such discovery happened back in the 1960s. The shocking thing is that the fishes that possess the venom gland have been known to science for a long time, some for over 260 years, and have been pretty well studied."

Conway said he has not been involved in a discovery of this magnitude since he joined the Texas A&M faculty.



Papillate clingfish, *Acyrtus artius*, a Caribbean clingfish with a subopercular venom gland, described in the 1950s. Credit: Peter de Graaf

Conway said clingfishes are globally distributed at temperate and tropical latitudes, and get their name from their ability to anchor themselves using their large belly sucker. The species Conway and his team discovered is a tiny marine [fish](#) less than an inch long that lives between pieces of coral rubble in very shallow water along the coast of Belize and islands in the Caribbean and Bahamas.

"Our work shows that even in relatively well-studied areas of the world's oceans, new species can be discovered as can unknown traits in well-documented species." Conway said.

Conway explained that in order to describe a new species, taxonomists have to make comparisons with other closely related species to ensure they are not "rediscovering" something already described by another researcher.

"During that comparison process we discovered that several species of Caribbean clingfishes, but not the new one we found, have a strange gland associated with a very sharp and spine-like subopercular bone, one of four bones that support the gill covers in fishes," Conway said. "The cells inside the gland are incredibly similar to those present inside the venom glands of scorpion fishes and certain catfish and based on this similarity, we are confident that these clingfishes are also producing some type of toxin."

"Discovering a venom gland in a group of well-studied fishes that has been known to science, some for well over two centuries, is truly remarkable," Conway said.

Conway explained that most of the world's 2,000-plus venomous species of fishes deliver their venom using a modified fin ray, sharp opercular spine or even through a large fang in their lower jaw. But the venom gland they discovered in the Caribbean clingfishes associated with the subopercular gill cover bone is the first of its kind to be discovered and in fact, is unique among all venomous fish described to-date.



Padded clingfish, *Arcos nudus*, a Caribbean clingfish with a subopercular venom gland described in the 1750s by Carolus Linnaeus. Credit: Louis Bahama

"We do not know exactly what the venom is used for, but based on the position of the venom gland, it is more likely that it would be used for protection, as in most venomous fishes.

"We don't yet have any information about the toxic properties of these clingfishes, but we hope that our discovery will encourage other scientists to take a look at the venom gland we discovered in more detail," he said.

Conway said clingfishes are referred to as crypto-benthic fishes which means "small, bottom dwellers."

"Crypto-benthic fishes are not commercially important, but are considered by the scientific community to play an important role in

marine ecosystems, because they are likely an important food resource for larger fishes," Conway noted.

More information: The complete study is available online:

www.plosone.org/article/info

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