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New fish species discovered in the Gulf of Mexico

Scientists from the Leibniz Centre for Tropical Marine Research (ZMT) in Bremen, together with colleagues from Central America, have described a new fish species in the Gulf of Mexico. Hypoplectrus espinosai belongs to the hamlet group and was discovered in the Alacranes Reef, a reef complex in the Campeche Bank in the southern Gulf of Mexico. The researchers from Germany, Mexico and Panama were able to describe the new species using genetic data, geographical records and photographs. Their study has now been published in the scientific journal Zootaxa.

Hamlets (Hypoplectrus) live in coral reefs in the Caribbean and the tropical northwestern Atlantic. They are predatory fish and feed on small fish and invertebrates. There are currently 18 recognised species, seven of which have been described in the last 14 years. Hamlets are essentially distinguished by their colour patterns, which vary from species to species and are largely genetically determined. The fish can grow ten to 15 centimetres in size.

With an average size of 11 centimetres, the newly discovered species Hypoplectrus espinosai, commonly known as the “Campeche Bank Hamlet”, is one of the small species. Its caudal peduncle, which connects the caudal fin to the body of the fish, is completely covered by a black saddle patch. This marking extends over the rear part of the body and sometimes also over the posterior part of the dorsal fin.

+++ How was the new species discovered? +++

“My Mexican colleague Alfonso Aguilar-Perera from the Autonomous University of Yucatán contacted me some time ago because he had observed a peculiar fish while diving in the Alacranes Reef in the Campeche Bank,” explains first author Oscar Puebla, marine biologist at ZMT and Professor of Fish Ecology and Evolution at the Institute for Chemistry and Biology of the Marine Environment (ICBM) at the University of Oldenburg.

The colour pattern of this “peculiar” fish resembled two well-known species of hamlets, the butter hamlet (Hypoplectrus unicolor), which is widespread in the Caribbean, and the Veracruz hamlet (Hypoplectrus castroaguirrei), which lives in the western Gulf of Mexico. Despite the similarity the newly discovered fish showed clear differences in its markings to these two species.

“This made us curious. We both thought it was a very interesting find, but we also knew that we needed genetic data and a broader geographical perspective to accurately identify this fish,” continues Puebla.

In order to collect data for the identification of the species, the two scientists brought some of their colleagues on board: Ichthyologists Omar Domínguez-Domínguez (University of Michoacana de San Nicolás de Hidalgo in Mexico) and Ross Robertson from the Smithsonian Tropical Research Institute (STRI) in Panama as well as Martin Helmkampf, an expert in bioinformatics from ZMT.

Professional underwater photographers Allison and Carlos Estapé completed the team and contributed numerous images of hamlets in the Campeche Bank.
In a joint effort, the researchers were able to compile a comprehensive dataset containing genetic data, geographical records and photos.

“For an ongoing project we had sequenced several hamlet genomes – including those of the butter hamlet (Hypoplectrus unicolor) and the Veracruz hamlet (Hypoplectrus castroaguirrei),” explains co-author Martin Helmkampf, who analysed the genomic data. “The genetic data showed that the fish observed by our colleague Alfonso Aguilar-Perera was indeed a new species.”

“We then described the fish on the basis of further specimens collected by colleagues Omar Domínguez Domínguez and Ross Roberston,” adds Oscar Pubela. “The black saddle patch on the caudal peduncle of the new species distinguishes it from the butter hamlet, whose patch is less extensive and only covers part of the caudal peduncle. The new species also doesn’t have the black eye mask that characterises the Veracruz Hamlet.”

+++ Why are new species of hamlets still discovered? +++

“In the past, different hamlets were thought to be diverse colour variants of one species, but today we know that they are individual species. The speciation process of hamlets is not yet complete, so this species offers an excellent opportunity to study the genetic drivers of rapid diversification,” continues Puebla. “How many species there are in the world depends on how quickly new species emerge and how many go extinct. The example of the hamlet shows how a natural evolutionary process may counteract the loss of biodiversity.”

+++ New species named after Mexican ichthyologist +++

The researchers named the new species Hypoplectrus espinosai in honour of Héctor Salvador Espinosa Pérez (1954 - 2022), a dedicated Mexican ichthyologist. He founded the Mexican Ichthyological Society and was the curator of the Mexican National Fish Collection.

The common name “Campeche Bank Hamlet” refers to the species' geographical distribution area, the Campeche Bank off the north coast of the Yucatán Peninsula in the south-west of the Gulf of Mexico. This species description highlights the Campeche Bank in particular and the Southwestern Gulf Mexico in general as an area of interest that harbours endemic reef fish and therefore requires special protection.

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The Campeche Bank hamlet, Hypoplectrus espinosai
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