



PRESS RELEASE

State Museum of Natural History Stuttgart

Egg-laying caecilian amphibians produce milk for their young

Researchers report in the journal "Science" on amphibians with a similarly complex brood care mechanism as mammals.

Stuttgart, 07.03.2024. Parental care for offspring occurs in many animals and is an essential part of the reproduction, propagation and development of an organism. An international research team from Brazil, the USA and Germany, including Dr. Alexander Kupfer, curator of Amphibians and Reptiles at the State Museum of Natural History Stuttgart, have revealed for the first time how egg-laying female caecilian amphibians successfully raise their offspring in the nest.

Caecilian amphibians are one of the least known vertebrate groups. The researchers were able to observe that the females of egg-laying amphibians, such as the species *Siphonops annulatus*, provide their young a similarly high-fat milk in the nest as, for example, egg-laying mammals. This discovery demonstrates the complexity of the evolution of reproductive strategies in vertebrates and expands our knowledge of brood care and communication in amphibians.

The research results were published in the renowned journal "Science".

In most vertebrates, the yolk is usually the only form of nutrition females are providing to the growing embryo. The research team observed that the young of the Brazilian caecilian *Siphonops annulatus* consumed milk for over two months, which appears to be secreted in response to tactile and acoustic stimulation from the mother's cloaca. The milk fed consists mainly of fats and carbohydrates and is produced in the glands of the female's oviduct.

"Through our investigations in amphibians, we have now discovered a vertebrate system in amphibians that has developed similarly comprehensive brood care mechanisms as known for mammals. This includes the production of fat-rich mother's milk and the release of milk to the young in the nest, known as lactation. This tells us a lot about the evolution and reproductive strategies of this still little-known vertebrate order," says Dr. Alexander Kupfer, zoologist at the State Museum of Natural History Stuttgart.

Caecilian amphibians are legless, snake-like amphibians that are widespread in the tropical regions of the world. All caecilian amphibians provide brood care. The female of the Brazilian amphibian *Siphonops annulatus* lays eggs and raises its hatchlings in the nest with fat-rich "milk" as well as its skin. Parental brood care is therefore similar to that of egg-laying mammals such as echidnas and platypuses.



For editorial offices

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<http://www.sciencemag.org>

<http://www.aaas.org>.

Image material:

Image 1: *Siphonops annulatus*_A.Kupfer.jpg

Description: A female of the Brazilian caecilian amphibian *Siphonops annulatus* with its young in the nest.

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Image 2: *Alexander_Kupfer_SMNS_L.Reinöhl.jpg*

Description: Dr. Alexander Kupfer with a model of a caecilian amphibian in the collections of the State Museum of Natural History Stuttgart.

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With its research collections, the "archives of diversity", the museum houses over 12 million objects. Its scientific activities focus on researching the evolution of life and analyzing the biodiversity of different ecosystems. In two permanent exhibitions, changing special exhibitions, events and guided tours, the Natural History Museum conveys both basic natural history knowledge and current research findings to the general public in order to promote a lasting understanding of nature and its complex interrelationships.

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