



PRESS Release – State Museum of Natural History Stuttgart

Triassic Life: Ancient amphibians, crocodile relatives, early dinosaurs and mammalian ancestors

Research team presents a comprehensive overview of Triassic terrestrial tetrapods and their environments in the Central European Basin.

Stuttgart, 11.03.2025. The Triassic is one of the most important periods in the evolution of life on Earth. After one of the greatest mass extinctions 252 million years ago, not only the dinosaurs but also many other groups of terrestrial tetrapods emerged and conquered numerous habitats. Since the early 19th century, the Central European Basin has been a historically important region for the study of the Triassic, and continues to yield a wealth of new spectacular finds. Rock strata and fossils from this period are particularly well preserved in south-west Germany. An international research team from the State Museum of Natural History in Stuttgart, led by palaeontologists Dr. Eudald Mujal and Prof. Rainer Schoch, has now presented a comprehensive overview of the Triassic terrestrial tetrapods of the Central European Basin. In this fundamental work, the scientists have analyzed both all known fossilized skeletal remains and footprints together for the first time. Many of the specimens come from the extensive palaeontological collections of the Stuttgart State Museum of Natural History. The research, published in the journal *Earth-Science Reviews*, provides a detailed reconstruction of the Triassic terrestrial tetrapod faunas, their palaeoenvironments, ecology and evolution.

The Triassic in south-west Germany

The Triassic covers the period from 252 to 201 million years ago. The area of present-day Baden-Württemberg was a central part of the Central European Basin. The extraordinary abundance of fossils and the extensive outcrops of Triassic rocks of this region make it easy to reconstruct the ecosystems of that time.

"The Triassic is an important window into the past for understanding evolutionary patterns, adaptations and the emergence of ecological niches. Terrestrial tetrapod communities are particularly fascinating. The rise of the dinosaurs began in the Triassic, there were already predecessors of modern mammals, and predatory crocodile relatives encountered giant amphibians. Research into the environment and animal communities is extremely exciting for us," says Dr. Eudald Mujal, palaeontologist at the State Museum of Natural History in Stuttgart and first author of the study.

Ecology, biodiversity, climate change

Research shows that the Triassic was an important period in Earth's history, laying the foundations for the development of complex life forms and the terrestrial tetrapod ecosystems as we understand them today. By combining different research approaches, scientists can make far-reaching statements about biodiversity, the ecology of individual species or the changing climatic conditions of the time.



At the same time, the large number of fossils studied indicates a greater diversity of terrestrial vertebrates in the Triassic than previously thought.

"We have correlated all the fossil finds with their palaeoenvironments. This has allowed us to understand how Triassic tetrapod communities evolved in their environment and how they responded to climate change, for example. Our results can also serve as a model for present-day ecosystems. A comprehensive overview of a geological period, like the Triassic, can also help us to assess the long-term consequences of climate change and biodiversity loss today," says Mujal.

Important fundamental work for palaeontology

The fossil collections of the State Museum of Natural History Stuttgart are of worldwide importance and a reference for the study of the Triassic. The recently published review work was made possible by the collaboration of an interdisciplinary research group at the State Museum of Natural History Stuttgart, in which specialists work on various aspects and tetrapod groups of the Triassic.

"Our team has analysed all the relevant fossils and geological strata of the Triassic in southern Germany and other parts of Europe for this important project, combining different research approaches. At the same time, a comprehensive literature review was carried out. Overall, the publication makes an important contribution to our understanding of the history of the Earth and the evolution of its organisms," says Prof. Rainer Schoch, Head of Palaeontology at the State Museum of Natural History Stuttgart and senior author of the study.

Special exhibition "Triassic Life" in Stuttgart

The Museum am Löwentor in Stuttgart displays numerous finds of terrestrial tetrapods from the Triassic period, including crocodile relatives - the top predators of their time - giant amphibians, the world's oldest turtle, the first dinosaurs in Europe, aetosaurs and remains of the first tiny ancestors of today's mammals. From 17 October 2025, the State Museum of Natural History Stuttgart will also be showing the major special exhibition of Baden-Württemberg 'Triassic Life - Aufbruch in die Zeit der Saurier', with more exciting finds from the Triassic period.

For editorial offices

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Image material:

Figure 1: *1_E. Mujal_Triassic habitat_Buntsandstein_SMNS, M. Rech*

Description: Dr. Eudald Mujal in front of an Early Triassic habitat at the Museum am Löwentor.

Some 250 million years ago, during the Buntsandstein period, the landscape was almost barren and desert-like. Fossil tracks (in the foreground) and individual skeletal remains tell us about the inhabitants of this habitat. Crocodile ancestors, some with sails on their back, were reptiles that lived here.

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Figure 2: *2_Trias_Batrachotomus_Lettenkeuper_SMNS, M. Rech*

Description: *Batrachotomus kupferzellensis* was the top predator of its ecosystem and belonged to the most dangerous group of animals of its time, the so-called pseudosuchians, which were crocodile ancestors. Several partial fossil skeletons of *Batrachotomus* are known from sites in Baden-Württemberg. It looked like a crocodile with long, upright limbs and was an agile, four-legged predator that grew up to six metres long. Its tooth crowns resembled knife blades with serrated edges, similar to the teeth of later carnivorous dinosaurs. These teeth were perfectly adapted to its predatory lifestyle. 240 million years ago, it hunted its prey, such as the giant prehistoric amphibian *Mastodonsaurus*, in a warm and humid swamp landscape among large horsetail plants.

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Figure 3: *3_Fossile_Saurier_Fussspuren_Trias_SMNS_E. Mujal*

Description: Fossilized reptile tracks from the Upper Triassic. In addition to fossilised skeletal remains, the research group also considered footprints and tracks in their comprehensive description of the Triassic in the Central European Basin.

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Figure 4: *4_Aetosauriernest_Trias_Museum am Loewentor, SMNS, E. Mujal*

Description: A spectacular find from Stuttgart-Kaltental: 22 aetosaurs lying close together. Aetosaurs distant relatives of crocodiles. They were probably omnivores. During the Upper Triassic, this group of animals was widespread over a large area. In Baden-Württemberg there are several very well-preserved finds of aetosaurs.

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Figure 5: *5_Triassic_Dinosaur_Plateosaurus_Keuper_SMNS, M. Rech*

Description: Dinosaurs in south-west Germany: The dinosaur *Plateosaurus* was a particularly large sauropodomorph. 210 million years ago, it was the largest terrestrial tetrapod, but still a very small forerunner of the later giant, long-necked dinosaurs. Plateosaur fossils have been found, for example, in Stuttgart-Degerloch and Trossingen. 210 million years ago, the climate was warm and dry.

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Contact:

Dr. Eudald Mujal, Department of Palaeontology
State Museum of Natural History Stuttgart, Germany
Tel. +49/(0)711/89 36/166
E-mail: eudald.mujalgrane@smns-bw.de

Dr. Eudald Mujal is available for further information and interviews.

Press contact:

Meike Rech, Communications Department
State Museum of Natural History Stuttgart, Germany
Tel.: +49 (0) 711 8936 107
E-mail: meike.rech@smns-bw.de

The State Museum of Natural History Stuttgart: A focus on innovative research and knowledge transfer.

The museum's research collections, the "Archives of Diversity", contain more than 12 million objects. The scientific work focuses on the evolution of life and the analysis of the biodiversity of different ecosystems. Through two permanent exhibitions, temporary special exhibitions, events and guided tours, the State Museum of Natural History Stuttgart communicates 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.

www.naturkundemuseum-bw.de