

## DESCRIPTION FOR THE GENERAL PUBLIC

The evolution is a process that continues for a billions of years. There are several factors that can influence its course, and when reconstructing it the researchers usually need to use knowledge from wide spectrum of natural sciences. Not only biology, but also geology, physics, chemistry, mathematics and even cosmology. One of that complicated factors are those that influence the ontogenesis – the process of origination, development and growth of organisms. Changes in this process often lead to rise of new forms and eventually new species by for example inhibition or acceleration of morphogenesis of some structures, elongation or shortening of the entire ontogenetic stages (including cessation and loss of some later ontogenetic stages in some forms). The course of evolution including the origination of new species could be studied mostly based on fossils, however rarely (in by definition incomplete fossil record) it is possible to study the whole morphogenesis of a particular species, especially in vertebrate palaeontology. Therefore, the fossil collection of bones of armoured reptile *Stagonolepis olenkae* from the Late Triassic (230 million years ago) of Silesia (Southern Poland) is so unique. It contains remains of juvenile, adult, and senile individuals, as well as absolutely exceptional early embryo, which is probably the oldest record of land tetrapod currently know. Based on this material we will be able to see how the skeleton of *S. olenkae* grew from the stage of 25 cm hatchling or embryo up to 5 m adult and senile individuals. Aetosaurs are scientifically interesting animals, because they belong to the basal lineage of reptiles (ex thecodonts) from which ancestors of crocodiles and birds derived. The oldest are known since 230 million years ago from Poland and Scotland, and the youngest lived 205 million years ago in America continent. During 25 million years of evolution they develop many forms and expanded on almost entire super-continent Pangea. Amongst aetosaurs are species that are small or large, carnivorous or herbivorous, slim or thick, with the armour consist of more or less uniform rectangular osteoderms or having long spikes around the neck. High variety within the group makes aetosaurs excellent subject for research on development and differentiation of the species. Most of *Stagonolepis olenkae* material is housed in the collections of University of Opole and Institute of Paleobiology Polish Academy of Sciences. Much of them, especially the postcranial skeleton are still waiting for the detail description and scientific publications. The most valuable specimen containing the aetosaur embryo or early hatchling is entirely enclosed by sedimentary matrix. Due to high risk of damaging it, only the scan in synchrotron gives chances on its proper studies including reconstruction of morphology and histology, which allow for establish its metabolic rates and growth dynamic through the growth curve reconstruction. The size of bones can be confusing in establishing the age of animals. Therefore, to check the exact age of the element, small fragments of it will be taken, and thin slices will be done. Under polarized microscope will be possible to determinate the trilaminar structure and count lines of arrested growth in the basal layer determining the age of each studied bone. The final result of the study on ontogenesis in *Stagonolepis olenkae* will be establishing of the model of changes during the skeletogenesis. The results will be used for revision of the aetosaurs species, with particular attention to young individuals that could be juvenile synonym of the adult forms. As a result of it will be possible to re-examine the aetosaur evolution based on the real biological principle.