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Larval development in Oligocene palaeobatrachid frogs

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A detailed account of the development of skeletal and some soft-tissue structures is based on 171 fossil tadpoles and metamorphosing froglets of Palaeobatrachus sp. from the Late Oligocene of the Czech Republic (locality Bechlejovice). Their exceptionally good preservation resulted from fossilization in diatomites. The fossil developmental series was compared with normal development of the contemporary anuran Xenopus laevis (Pipidae) represented by cleared and stained (alizarin/toluidin-blue) whole-mount specimens. The comparison revealed that in spite of differences in the sequence of ossification and its timing (e.g., ossification of the otic capsules and ribs was retarded in Xenopus whereas dermal ossification was retarded in Palaeobatrachus), in the number of free ribs, and in composition of the sacral region (the synsacrum in Palaeobatrachus involves two posterior presacrals, whereas there is a single sacral in Xenopus), both genera were similar in great number of anatomical features that appear during development. The most important difference is the shape of vertebral centrum (procoelous in Palaeobatrachus, opisthocoelous in all Pipidae) which is formed in comparatively early developmental stages. A view that could result from anatomical comparisons is that Palaeobatrachus could be derived from the Pipidae, but this is doubtful due to biostratigraphic and palaeogeographic discrepancies. The earliest palaeobatrachids were recorded from the Late Cretaceous of Europe but pipids could not invade northern continents after the Early Cretaceous when the Tethys Sea prevented interchanges of anuran faunas. Also, all palaeobatrachids retain primitive anatomical features (e.g., five pairs of ribs) that were more derived even in the earliest pipids from the Lower Cretaceous of Israel.

Key words: Anura, Palaeobatrachidae, larval development, Oligocene, Czech Republic.

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