

Carboniferous and Permian faunas and their occurrence in the limnic basins of the Czech Republic

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The Central and West Bohemian Late Paleozoic Basins, Krkonoše Piedmont Basin, Intrasudetic Basin, Boskovice Graben, and Blanice Graben are limnic Permo-Carboniferous basins that form a significant part of the geological structure of the Czech Republic. Paleontological research in these basins has been actively conducted for nearly two hundred years. This ongoing research continues to provide new evidence of the geological structure and stratigraphy of these basins, and further reveals their relations to other analogous basins in Europe. Knowledge of the fauna that occurs in these Permo-Carboniferous basins has increased along with the progress in understanding their geological structure. The earliest known discoveries of faunal remains occurred in connection with the mining of coal, copper ores, and limestones. The first invertebrate specimen to be described was of the scorpion *Cyclophthalmus senior* from the collections of Count Šternberk, which was referred to by A. Corda in the year 1835. Subsequent papers about invertebrate specimens were published by J. Krejčí and later by J. Kušta. The first vertebrate fossil to be described from these basins was that of the actinopterygian fish *Amblypterus vratislaviensis*, which was described by L. Agassiz (1833-43). Agassiz chose the species name vratislaviensis, indicating that he obtained the specimen from the museum in Wrocław, Poland (the Czech version of this name, Vratislav, was widely used in historical Latin documents), but the fish originates from the Lower Permian limestone from the Intrasudetic Basin, probably from the Ruprechtice locality. Further descriptions of actinopterygian fishes from the Krkonoše Piedmont Basin continued to appear during the twenty years following Heckel's work. Later in the nineteenth century, new finds from the Boskovice Graben were briefly described by Makowsky (1876) and Rzehak (1881).

Despite this considerable previous work, the fundamental understanding of the Permo-Carboniferous faunas began with the research of Prof. Antonín Frič. The discovery of rich faunal remains in the gas-coal at the Humboldt mine in Nýřany provided most of the impetus for his work. Frič's studies led to his monumental four-volume work "Fauna der Gaskohle und der Kalksteine der Permformation Böhmens." This outstanding work was issued in 15 parts from 1879 to 1901, and contains the results of his study of the faunas of the Central and West Bohemian Carboniferous Basins, Krkonoše Piedmont Basin, Intrasudetic Basin, Blanice Graben and partly also the Boskovice Graben. Fritsch's work provided a new basis for studying of the Permo-Carboniferous faunas of the Bohemian Massif, and it has served as an indispensable resource for many subsequent studies by researchers from around the world even up to the present day (Augusta, Brough, Carroll, Gardiner, Milner, Petrunkevitch, Reisz, Romer, Schneider, Werneburg, Steen, Westoll, and many others). Even numerous taxons described initially by Frič remain valid, though they have been reviewed several times during the course of a hundred years. They also form the basis of the list of fauna contained in the present publication.

Research on the fauna of the limnic basins of the Bohemian Massif continued during the first half of the twentieth century mainly in the Boskovice Graben. J. Augusta continued the study of amphibians described earlier by A. Makowsky and A. Frič, and discovered many promising localities. The excavations of Z. Špinar and J. Kukulová-Peck in the 1950s utilized and advanced Augusta's discoveries in the Boskovice Graben, as Špinar further developed the study of discosauriscid amphibians, and J. Kukulová-Peck discovered several localities with an unusually rich insect fauna.

These investigations continued through the second half of the twentieth century, and much research is being actively pursued at the present time. For example, J. Schneider studies insects from the Boskovice Graben and Krkonoše Piedmont Basin, J. Zajíc reviews the Stephanian and Lower Permian Acanthodians, S. Štamberg has opened several localities in the Krkonoše Piedmont Basin and Boskovice Graben and reviews and describes actinopterygians, while J. Klembara reviews the discosauriscid amphibians of the Boskovice Graben.

More recently, many species have been the subject of redefinition due to occurrence of synonyms given by various authors, while others have been separated into different genera and species. The present study lists the localities and names as

they are used at the present time, and with the present view of their stratigraphical range. This survey of the fauna of the limnic Permo-Carboniferous basins of the Bohemian Massif records the present taxonomical concepts, the revision of older material, and new findings. Furthermore, it revises the state of the type material, reviews the type material stored mainly in collections in the Czech Republic, and draws attention to some important specimens and collections of fossils suitable for further study.

The list of localities contains 205 places and 104 boreholes from which specimens have been described in the literature. The list of faunas encompasses 399 species and enumerates groups of specimens that have not yet been classified. Permo-Carboniferous faunas of the limnic basins of the Bohemian Massif are comprised of Coelenterata (1 species), Annelida (4 species), Bivalvia (10 species), Gastropoda (2 genera), Tentaculitoidea (2 species), Merostomata (3 species), Arachnida (40 species), Branchiopoda (6 species), Ostracoda (2 species), Malacostraca (3 species), Myriapoda (35 species), Insecta (180 species), Chondrichthyes (17 species), Acanthodii (5 species), Actinopterygii (27 species), Dipnoi (2 species), Crossopterygii (1 species), Amphibia (47 species), and Reptilia (13 species).

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