

Carboniferous Rainforest Collapse

GEOL 204 The Fossil Record

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What was the Carboniferous Rainforest Collapse?

The Carboniferous Rainforest Collapse was a minor extinction that happened 305 Ma (Late Moscovian to early Pennsylvanian). It was originally a rainforest home to many tetrapods and plants. The rainforest was also very good for the production of coal. (Figure 1).

What caused the Carboniferous Rainforest Collapse?

Originally in the Moscovian the climate was hot and wet which is perfect for the growth of an ecosystem in a rainforest. Eventually, the climate changed to cool and dry which caused the living organisms and plants in the rainforest to struggle. As the plants continued to struggle, the oxygen levels decreased which made life for living organisms even more difficult. Another possible cause of the minor extinction was intense glaciation which led to lower sea levels. This is also related to the issues that arose from a colder climate.

The Extinct Taxa of the Carboniferous Period

The Carboniferous Rainforest Collapse affected early tetrapods the most, which are four footed animals. Early tetrapod species increased in numbers during the Carboniferous period, but as endemism occurred, different groups became isolated from each other. Endemism is when a species becomes unique to an area and they exist only in that geographic region. This is not the same as being a native species, because native species can exist in other geographic regions. The tetrapods that suffered the most after the collapse were amphibian species; their diversity suffered. Most amphibians could not survive in the drier climates. Some amphibians that became extinct during the Kasimovian-Gzhelian interval, which was about 303.7 Ma- 298.8 Ma, were the basal tetrapod families Baphetidae and Colosteidaepre. Pre-Kasimovian amphibians and reptiles regularly fed on fish, making them piscivores. Tetrapods such as the *Diadectes* and the *Edaphosaurus* fed on high fiber plants during the Kasimovian-Ghezalian period.

Fossil Sites of Carboniferous Rainforest

Collapse: Hamilton, USA, Jarrow, UK, Linton, USA, Newsham, USA, Nyrany, Czechoslovakia, Joggins, Canada (Joggins, Canada site shown in figure 2)

Extinction Patterns on Land

Plants decreased in diversity which in turn caused a decrease in the oxygen levels. This affected the large arthropods and other invertebrates which could not maintain their size with these decreased levels of oxygen. This caused them to be wiped out during the collapse, especially giant dragonflies. Animals were also drastically affected because of the lack of available resources for survival and were forced to adapt quickly to their new limited surroundings.

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