

Why do insects abandon their large prehistoric bodies and become smaller and smaller?

Giant insects have always been a rich source of fuel for science fiction movies, and in fact there have been periods of huge giant size.

If the insects were mutated and reached a huge size, then perhaps the usual sharp weapons of humans could not cope with them. And obviously it is a great advantage to be able to survive in the natural environment. So why in the past have insects grown so big in size, but over time they have evolved to shrink in size?

In 1880, in Commentry, southern France, coal miners unintentionally dug out fossils of a giant insect with oversized wings. In 1885, French paleontologist Charles Bloominat, after careful observation and research, named it Meganeura - the Giant Dragonfly.

In 1979, another fossil of a giant dragonfly was found in Bolsover and is now stored in the French National Museum of Natural History in Paris.



This dragonfly looks quite similar to modern dragonflies, but the difference is that their wings are up to 75cm long, many times longer than modern dragonflies and this is also considered a large insect. The most ever existed on Earth.

In terms of size, the Meganeura possesses the size of a modern eagle, their main food is flying insects, reptiles, even they also eat small populations. living at the same time with me. And perhaps they are also the inspiration for the giant dragonflies in Michael Crichton's Jurassic Park novel.

The giant dragonflies *Meganeura* lived during the Carbon period about 300 million years ago. This means that they existed in this world earlier than the giant dinosaurs lived 250 million to 65 million years ago.

During this period, in addition to the giant dragonflies, there are also large and long-sized mosquitoes on Earth, the arthropods can be up to 1.55 meters long and giant tadpoles 2 , 6 meters . all giant insects are almost all products of this era. Therefore, the Carbon period is also known as the "era of giant insects".

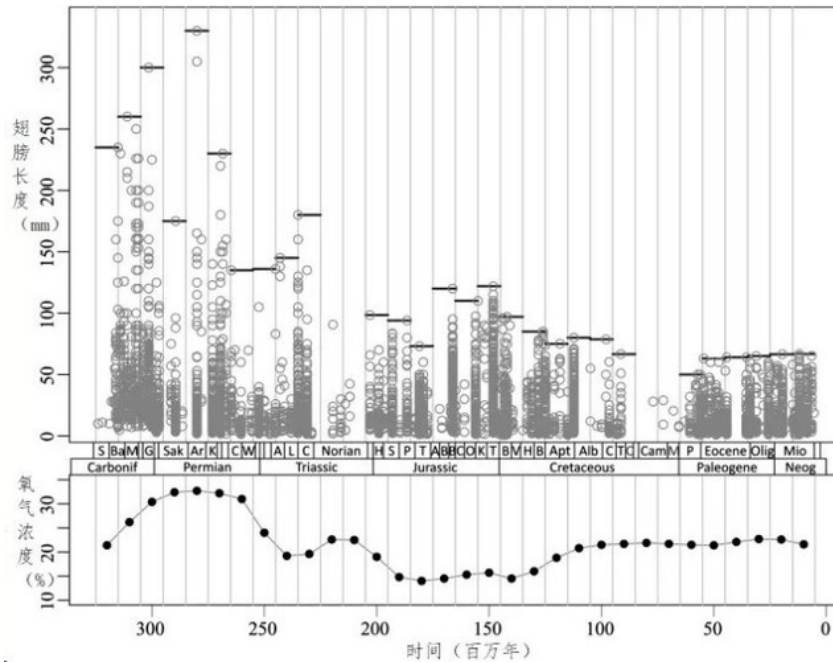


These giant arthropod species have lived on Earth for about 50 million years and disappeared during the mass extinction.

But then they were reborn again, only their size was much smaller than before. Over time and the evolution of life, these insects have gradually become the size they are now.

Insects have grown to their size and dominate the world, but why have they become so small creatures that they can easily be removed with a single hand of a human?

In 2012, paleontologists Matthew Clappen and Jared Carr at the University of California, Santa Cruz published an article stating that they had compiled a database of more than 10,500 insect fossils in 320 million. last year to learn about the changes in wing lengths and their size in evolution.



They found that during the first 150 million years of insect evolution, their body size was positively correlated with the oxygen concentration at that time.

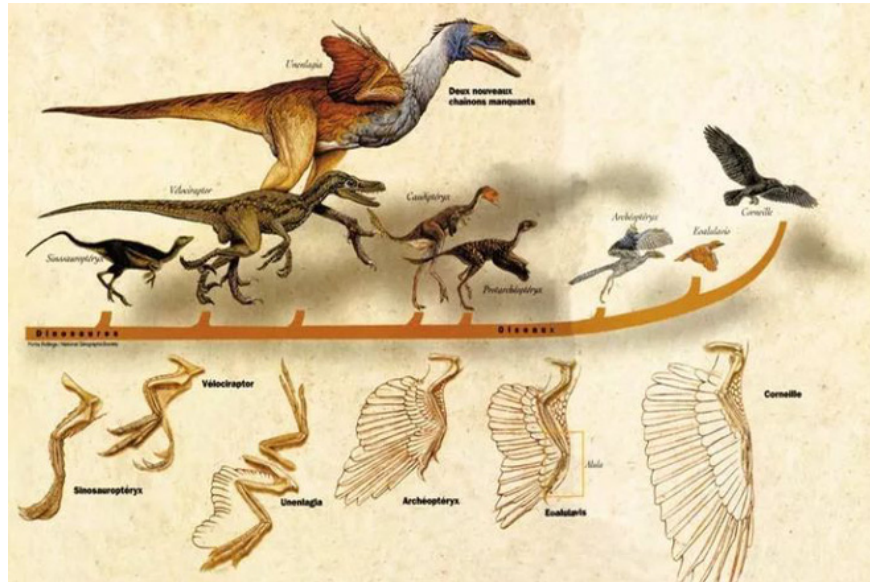
In an environment with high oxygen content, insects tend to increase in body size, however, this relationship also gradually disappears over time and insects also become smaller.

The moment when the insect's body shape began to shrink coinciding with an increase in the number of ancient bird of prey, they evolved to have wings almost similar to those of modern birds.

Fossil studies show that the birds at the time had an almost similar anatomical structure to that of winged dinosaurs, but their ability to prey greatly improved.

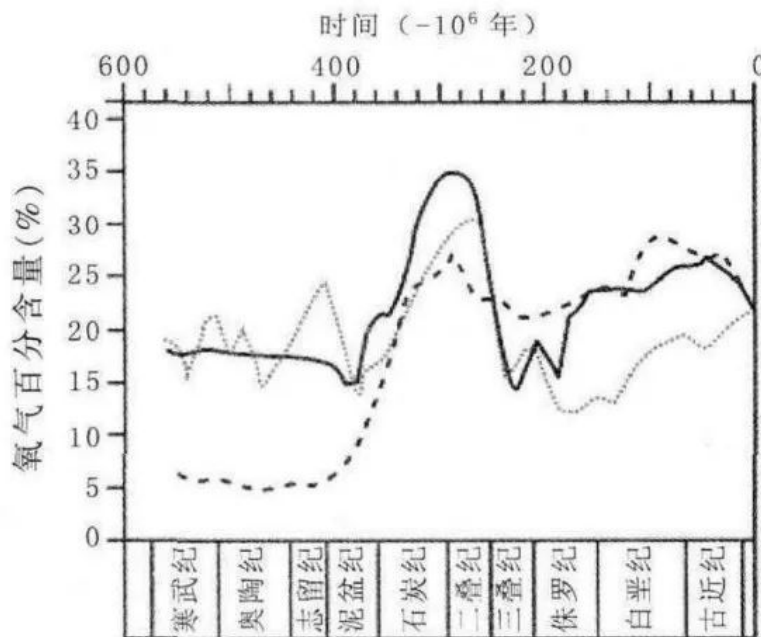
That means that large insects will be easily discovered and easily become the target of ancient birds.

But 60 million years ago, accompanied by the evolution of bats, the mass extinction of the Cretaceous as well as the evolution of birds once again caused the insects to shrink in size. to survive and become harder to detect.



So why is the age of Earth's giant insects so rich in oxygen? Carboniferous is the period that represents the prosperity of the plant world. At that time, the climate was warm and humid, very beneficial for the growth of plants. Terrestrial plants gradually move from along the coast to the mainland, forming forests and swamps and causing much higher levels of oxygen than today.

Currently, the oxygen content in the atmosphere is about 21%. However, in a study by Yale University biologist Robert Berner and his team, the amount of oxygen in the atmosphere during the Carbon period can be as high as about 35%, much higher than current levels. .



And to prove that the oxygen content is related to the size of insects, scientists nurtured dragonflies of the same generation under different aerobic conditions. And the result was not unexpected, dragonflies reared in high-

oxygen conditions grow faster and 20-15% longer than those in the wild.

Although their size is still many times smaller than their ancestors in the carbon period, this variation can still explain that oxygen concentration has a certain effect on dragonfly's body length. .

Therefore, before the appearance of natural enemies, oxygen levels on Earth were clearly associated with changing the size of insects.



But not all experiments show a correlation between insect size and oxygen concentration. Jon Harrison, an insect researcher at the University of Arizona, and his colleagues did the same experiment.

They studied locusts, rice weevils, and some other insects, then reared them in environments with different concentrations of oxygen. It has been found that insects in high oxygen environments are unlikely to achieve a larger size than in the wild. Similarly, insects reared in low oxygen environments are not all reduced in size.

The scientists then did similar experiments with fruit flies, and the results were consistent with Jon's experiments, some of which grew in size in high-oxygen environments and some did not.

So why do insects abandon their huge bodies and instead become smaller and smaller? This is still worthy of further research by scientists, but it is certainly the result of adapting to the environment, and shrinking the size has allowed them to occupy almost every ecological environment on the planet planet.

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