

Creepy-Crawlies of Florissant's Eocene Time



By William A. Dexter

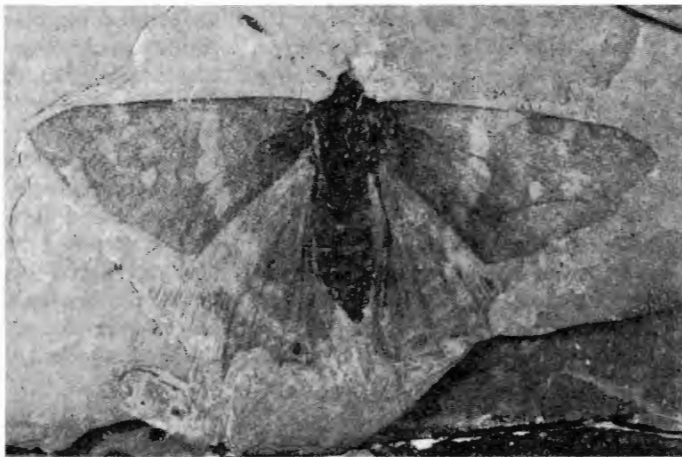
Did you know that today every fifth living thing in our world is a beetle?!

It is estimated that over one million species of insects are alive today. It is very possible that millions more remain to be identified. Add the number of extinct insect species and the total becomes astronomical. Insects were, and are, the most successful organisms ever to have lived on earth. With the exception of microscopic organisms, insects far outnumber all other living things combined.

Four insect orders have been around for more than 300 million years. Insect fossil parts have been found in Cambrian rock nearly 600 million years old! Fifteen insect orders had developed by 200 million years ago, at the time of the initial stages of Pangea, when continental drift started and the dinosaurs first appeared. Most major insect groups were established during Carboniferous times—the time of the coal age forests. Some Carboniferous dragon flies attained wing spans of over 30 inches; cockroaches grew to 12 inches in length.

Thirty-five million years ago, an overwhelming number of insect species flourished around and about ancient Lake Florissant, site of the present day Florissant Fossil Beds National Monument in Colorado. It is estimated that as many as 75 percent of all modern insect genera were present when the Florissant Fossil shale beds were laid down. Although there are representatives of modern genera and families at Florissant, all the individual species that lived in the Florissant area during Eocene times now are extinct.

Two of the most abundant insect orders prevailed during ancient Florissant times. One group includes the bees, wasps, and ants; the other includes the beetles. Snout



Right: Ancient wasp (*Paleovespa Florissantentia*) probably resembling a modern day bald-faced hornet. This carbon imprint is some thirty-five million years old.

(PHOTO BY WALT SAEUGER)

Left: Fossil butterfly (*Prodryas persephone scudder*), unique in the world, was carefully preserved for about thirty-five million years.

(PHOTO BY F.M. CARPENTER)

beetles (weevils) and ground beetles are the most common beetle types found as fossils in the Florissant Lake deposits.

The great diversity of insects represents an astounding success story and rapid evolution. Why are insects so successful? Why were insects so numerous in and about Florissant's ancient lake?

We might look for answers first in the unique overall appearance that insects share in general. They all possess a chitinous exoskeleton or hard outer body parts. This body support system provides armor-like protection. Another unique property is that 99 percent of all insects have wings, which aid them in their pursuit of survival. Their relatively small size makes them unobtrusive. Their ability to hide under vegetation and rocks helps to promote their preservation, protection, and further success. Short developmental stages allow for rapid regeneration, fast adaptation rates, and thus an increased survival duration.

Insects in general have a variety of feeding habits. Some eat vegetation. Others are predacious or parasitic and feed on other animals. A few insects even devour one another, (probably not one of their survival skills).

Insects have a multitude of lifestyles, variously termed incomplete and complete metamorphosis. Grasshoppers, crickets, and roaches have incomplete life histories. This means that when they hatch from eggs, the

young appear as miniature versions of adults. Complete metamorphosis occurs where the young develop by dramatic "leaps and bounds," not in a gradual manner and by means of various larval stages.

Some insects within the same species have different life forms. Ants, for example, have workers, queens, and winged members—the latter being sexually active and searching for mates; other forms of ants are sexless. Beetles, such as weevils and scavengers, are known to have foraged about the most productive areas of ancient Florissant Lake, hence would be more easily trapped by volcanic ash and dust. The variety of life cycles in the insect world increases their overall competitiveness and provides for successful life histories.

Those in subterranean habitats would have had little contact with poisonous volcanic gasses, such as methane and cyanide. All these various conditions collectively reflect the successful nature of insect behavior and ecology.

The insect story of the ancient Lake itself is a dramatic one. Insect fossils retrieved from the lake bed shales represent over 1,100 species, 19 orders, and 146 families. More insect varieties than from any other fossil formation in the world are found in these multi-layered shale beds.

Visitors to the Florissant Fossil Beds National Monument can read the fossil evidence, revealing a chapter of ancient life trapped in the paper thin pages of time—an epoch some 30 million years before the onset of humanity. To visit Florissant and then consult the yellow pages under "exterminators," is to realize that insects continue to make one of the strongest of Life's bids to "inherit the earth."

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