

# Florissant Fossil Beds

## Fossil Insects

National Park Service  
U.S. Department of the Interior

Florissant Fossil Beds  
National Monument



Beetle (YPM IP 1)



Dragonfly (FLFO 6565)



Hopper (MCZ 5013)

Relatives of insects were the first lifeforms to live on land, and today insects are the most numerous and diverse animals on the planet. Insects are rare as fossils, however. The Florissant fossil beds contain an exceptional diversity and abundance of fossil insects, including more than 1,500 different species.

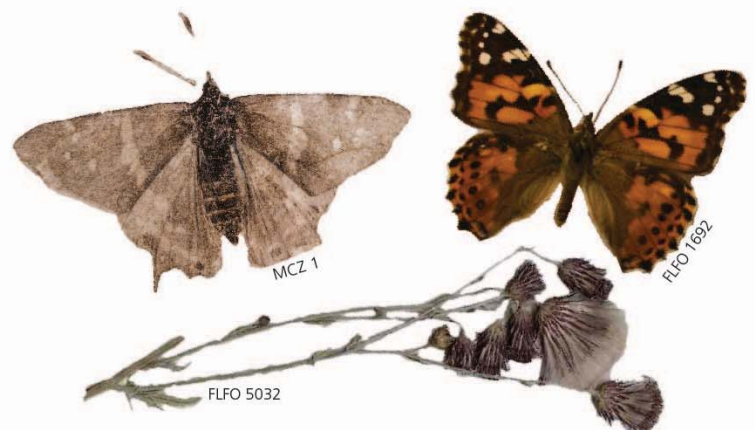
### Why study insects?

Three out of four kinds of animals are insects. There are twice as many species of flies (Diptera) as there are of all vertebrates (fishes, birds, reptiles, amphibians, and mammals). Insects live on every continent and play major roles in every ecosystem: they pollinate flowers, eat plants, decompose dead matter, and provide food for many other animals. Some insects spend part of their life cycle as parasites, usually on other insects but occasionally on vertebrates. In order to understand and respond to issues in conservation biology, agriculture, and medicine, we need to know about the animals involved, and insects are some of the most important animals on earth!

Fossil insects show how ecosystems have changed and moved over time. By tracing living species back to their fossil ancestors, scientists can propose explanations for the diversity and geographic distribution of insect groups alive today.

### Why are fossil insects so rare?

Most bodies decay, erode, or are scavenged before they can become fossils. Softer body material is more fragile, so it is less likely to preserve. Teeth and animals with a thick cuticle (hard covering) like beetles are more common as fossils than soft-bodied animals like spiders. Even the most fragile animals can fossilize, however. The gentle lake environment of Florissant in the late Eocene (34 million years ago) led to the preservation of the delicate insects that lived then.



Fossil butterflies (Lepidoptera) are very rare. *Prodryas ipersephone* (top left, life size) is one of the best examples ever found. *Vanessa* (the painted lady), a close relative, still flies at Florissant (top right). Their caterpillars love to eat thistles like this native Colorado species (*Cirsium*) (bottom).

### Are fossil insects the same species as living ones?

Almost all of the insect species found as fossils at Florissant became extinct in the 34 million years since they were buried. Descendants and relatives of these species survive today, however, and many still live in Colorado. Insects evolve more slowly than many other organisms do, and many Florissant fossil insects look nearly identical to their living relatives. Fossil insects from older deposits look more different.



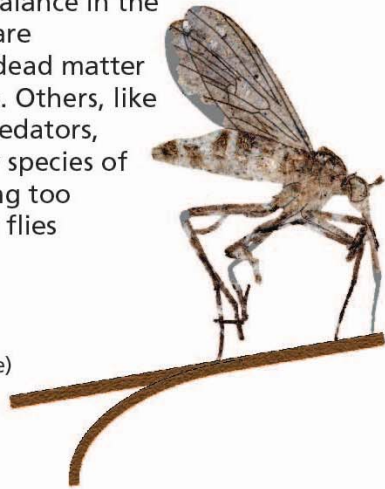
Tsetse fly (UCM 66281)

"Fossil insects offer an extraordinary opportunity... throwing so much light on the evolution and migrations of insects, and therefore of prime importance for the understanding of the modern fauna."

T.D.A. Cockerell, 1937

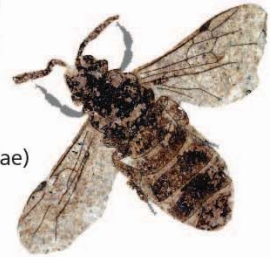
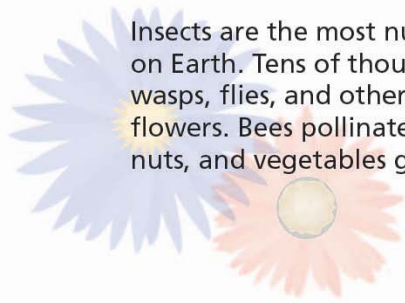


Flies help maintain balance in the environment. Some are scavengers who eat dead matter and recycle nutrients. Others, like this Dance Fly, are predators, which and keep prey species of insects from becoming too abundant. Still other flies pollinate flowers!



Dance fly  
(Diptera: Empididae)  
UCM 18637

Insects are the most numerous animal pollinators on Earth. Tens of thousands of species of beetles, wasps, flies, and other insects carry pollen among flowers. Bees pollinate three-quarters of all fruits, nuts, and vegetables grown in the United States!



Sweat bee  
(Hymenoptera: Halictidae)  
UCM 78130

Many insects, like this damselfly, live in water as larvae. Some are "indicator species," which only survive in conditions of high water quality. Biologists count the number and kind

of insects and other invertebrates to monitor the health of streams and rivers.



FLFO 9764

Damselfly larva  
(Odonata: Zygoptera)



Scarab Beetle

(Coleoptera: Scarabaeidae)  
USNM 90441

Beetles are one of the most common insects found as fossils. Their thick, hard cuticle (outer covering) protects them in life from drying out, predation, or being crushed. The cuticle also protects their bodies during fossilization.

Fossil insect pictures on this page are **four times larger than life size.**

Female earwigs dig nests and guard their offspring in most of the nearly 2000 species of this group. Mother earwigs also lick their eggs to keep them clean of mold. Contrary to their name, these insects do not attack ears, and they also don't bite and can't sting!



Earwig  
(Dermaptera)  
FLFO 7169

### Where can I see more?

Anyone can access the database of photographs and records for the several thousand insect and plant fossils from Florissant that have been included in publications (web address at right). Also, Florissant Fossil Beds National Monument is a participating institution in the Fossil Insect Collaborative. This National Science Foundation sponsored group is adding tens of thousands of fossil insect records from Florissant and other locations to the Integrated Digitized Biocollections database ([idigbio.org/portal](http://idigbio.org/portal)).

Fossil Insect Collaborative website  
[iDigPaleo.org](http://iDigPaleo.org)

Florissant Fossil Beds specimen database  
[planning.nps.gov/flfo/tax3\\_Search.cfm](http://planning.nps.gov/flfo/tax3_Search.cfm)

Images courtesy of Florissant Fossil Beds National Monument (FLFO), Harvard Museum of Comparative Zoology (MCZ), Smithsonian National Museum of Natural History (USNM), University of Colorado Museum (UCM) and Yale Peabody Museum of Natural History.



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