

Why are there so many flowering plants?

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In the cretaceous period, around the extinction of the dinosaurs, the first flowering plants or angiosperms appeared. Today they are the most abundant and most diverse plant group on earth. How did they become so widespread and diverse?

Early Angiosperms:



This is a fossil of *Archaeofructus lianingenensis*, one of the oldest angiosperm fossils. It is from the early cretaceous period Shizhao, Wikimedia commons CC

When flowering plants came into existence, the dominant plant group was the gymnosperms, this group includes conifers, cycads and ginkgos. These plants grow slowly and use very little nutrients relative to angiosperms.



Modern conifers
Mike Petrucci, Wikimedia
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Modern cycads
Colin Smith, Wikimedia
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Modern ginkgo
Marja Gajic, Wikimedia commons CC

The early angiosperms were weedy species that grew quickly and tolerated high levels of disturbance relative to gymnosperms. They also required higher levels of soil nutrients.

Pollenating Insects:

Most angiosperms are insect pollenated so you might expect that the diversification and spread of angiosperms coincided with a diversification or spread of pollenating insects, but this is not what the fossil record shows.

So what caused it then?

We can't know for sure because it is hard to find evidence for something that happened so far in the past, but it seems that the explosion of angiosperms had to do with their ability to thrive in disturbed areas. This is because early angiosperms were weedy species that grew very quickly while the early gymnosperms were slow growing species that did not tolerate disturbance. These disturbed areas also had the high levels of soil nutrients that angiosperms required so angiosperms prospered there. In these areas, angiosperms further promoted their own growth by making the soil fertile with their own dead leaves. This created a positive feedback loop which led to more early angiosperms.

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