How do paleobotanists (scientists who study plant fossils) determine which fossil leaves belong with which fossil stems or roots, so they can reconstruct what an extinct plant looked like? Reconstructing plants from fossil fragments is like putting together a jigsaw puzzle where many pieces are missing and some of the pieces present are from other puzzles. This is because not all plant organs are found together. Flowers, leaves, fruits, seed, wood, or roots might be produced or dropped at different times of the year. They might be dispersed by wind or water and come to rest far away from each other. Each may require different burial conditions to even be preserved as fossils. To create reconstruction drawings, paleobotanists must study extensive collections of fossils to find plant parts that are connected to each other, relying on the co-occurrence of the fossilized plant organs in both location and geologic time. Whole plant reconstructions help us gain a better understanding of Earth’s ancient flora. It is important, however, to remember that all reconstructions are to some extent hypothetical.

Lepidodendron is a good example of how scientists reconstructed a whole plant from fossil fragments. The fossilized organs of what is now called Lepidodendron were found and named separately. Fossilized bark impressions were discovered first and named Lepidodendron, leaf fossils were called Lepidophylloides, root fossils were called Stigmaria, and spore-bearing cone fossils were called Lepidostrobus. Because these various fossil organs are often found together, are the same age, have similar anatomical traits, and can be visualized as fitting together from a structural standpoint, paleobotanists now agree that they all belong to the same type of plant.

Many plant fossils can be seen at the Beneski Museum of Natural History, Amherst College, which displays over 1,700 fossils and other objects.