

Stop 314 Adult Tour – Convergent Evolution, Succulent House

Sometimes, botanically unrelated plants that live in similar habitats resemble each other in outward appearance. This can happen even though the plants may be growing on opposite sides of the earth, and have different evolutionary origins. Over time, they have independently evolved similar adaptations to the same types of environmental conditions.

This is known as the theory of convergent evolution, which is wonderfully represented in the example of these two plants. The plant on the right is *Cereus hildmannianus*, the 'Queen of the Night' from South America. The plant on the left is *Euphorbia candelabrum*, the 'Candelabra Tree' from Africa. Based on appearance only, one might assume that the two are related. However their flowers and genetics show them to be in different plant families. The *Cereus* is in the cactus family, and related to the many cacti you see on the north side of the greenhouse. The Candelabra tree is a member of the Euphorbia or spurge family, and more closely related to the crown of thorns and the poinsettia. How these plants look is linked much more to the climatic conditions of their habitat than it is to their family tree.

While the two plants rarely bloom at the same time, if you could look at the flowers of both plants, you would notice some obvious differences. Cacti generally have large showy flowers with lots of petals, while euphorbias have tiny flowers that are hardly noticeable; although sometimes they are surrounded by showy bracts, as in the case of the poinsettia. Another difference is that many euphorbias, and there are several different species in this greenhouse, will put out leaves when there is an adequate water supply - but most cacti have no leaves at all. These differences are a few clues that would tip off a botanist that these two plants aren't quite so similar as a first glance would indicate.