

Carboniferous Fact File

Tree fern

Superficially, tree ferns and cycads look very similar – a fern sitting on top of a palm tree trunk. However, they are very different plants with very different ways of dealing with the same problems.

A different body plan

Tree ferns grew to enormous size in the Cretaceous, and can still be found in tropical rainforests today – a bit smaller. Although they reached large sizes, they have no woody tissue in their stems and so are not real trees; in fact, they are simply just big ferns. The slender stem is supported on the outside by the weathered remains of adventitious roots (roots that have grown out of the bases of the leaves) and buttressed at the base by more persistent roots. You could look at the stem as being more of a rhizome than a true stem, although it does contain vascular tissue to carry food and water up to the leafy crown.

Reproductive advances

Tree ferns practice vegetative reproduction much of the time – they send up new plants at the ends of their widely spread rhizomes. This saves a lot of energy and means they can colonise a patch of good ground quickly and keep the competitors out. However, they do also reproduce using spores, but in a very old-fashioned way. The leaves of tree ferns carry spore-producing structures on the underside at the edges of the leaves. These spores are unisex and are simply shed into the wind and carried away. Wherever they land, a new gametophyte plant grows (this is a small green disc totally unlike its parent). Again, male gametes swim across the surface to female gametes held in special protective structures and a new tree fern sporophyte grows from this union. It all sounds very familiar and quite dated – but the evolution of spore-producing parts at the edges of the leaves is an important one. Remember, a flower is just a collection of specialised leaves, and this may be one way that flowers evolved.