

Flora Fossil



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Yea Flora Fossil Site, Victoria

An ordinary roadside cutting on Limestone Road, Yea, Victoria marks a place that overturned long held scientific understanding of how and when plants evolved.

The significance of the Yea flora fossils, although first discovered in 1875, was not realised until 60 years later when they were studied by pioneering scientist Dr Isabel Cookson in 1935.

Dr Cookson identified the remains as ancient vascular land plants. Her findings were significant around the world as they suggested that not only did complex land plants develop much earlier than previously thought, but that they also first evolved in the Southern Hemisphere.

Further work has shown the Yea flora fossils to be about 415 million years old and the oldest of their kind in the world.

The plant, known today as *Baragwanathia*, first appeared around 415 million years ago, at a time when Australia was still part of the Gondwanaland super-continent, and long before dinosaurs walked the Earth.

The name, *Baragwanathia*, was in honour of William Baragwanath, Director of the Geological Survey and Chief Mining Surveyor in Victoria in the 1920s and 1930s who collected many of the samples.

The plant would have resembled today's club mosses or tassel ferns. It had a vascular system, with sap-carrying veins, leaves roots and woody tissue, and was more complex than other forms of vegetation from this period, such as marine algae.

Baragwanathia plants are large in form with long narrow leaves and branches up to one metre long. They are quite unlike other land plants occurring at the time which featured small, naked stems.

The Yea site has yielded several different plant fossils. Some of the most interesting are the extremely well-preserved samples of the fossil identified as *Baragwanathia longifolia*.

The Yea plant fossils found in siltstone rock date to the late Silurian period. It was during the Silurian that life adapted from the sea to the land.

Fossil scientists are able to determine the age of rocks by identifying the type of graptolite fossils present. Graptolites were ancient free-floating colonial marine organisms and are particularly important for dating rocks during the Silurian period, when they flourished.

The Yea site provides the earliest record of the vascular land plants in Australia. The plants show remarkable adaptations that helped them to make the difficult transition from the marine environment to life on land. For this reason, and because the Yea *Baragwanathia* fossils are considerably older than any similar ones found in the Northern Hemisphere, the Yea Fossil Site is of international significance.

The site is listed in the National Heritage List for its significant contribution to the world's understanding of our ancient earth's secrets.

It is also listed for its association with Dr Cookson, one of the most eminent palaeobotanists of the 20th century.

Known around the world by admiring colleagues as 'the indefatigable Cookie', Dr Cookson was one of the first professional women scientists in Australia, graduating from the University of Melbourne in 1916, where she also tutored and lectured in botany and later became a research fellow.

Her work took her to London and Manchester in the 1920s, where she worked closely with, and influenced, other leading scientists of the day. Her published research, spanning 1921–1970, and often self-funded, produced great insights into the history and evolution of the continent's flora.

The *Cooksonia* plant genus, containing the oldest known land plants was named in her honour, and the Botanical Society of America's Isabel Cookson Award commemorates her work. The *Cooksonia* fossils, found mainly in Europe, are older than the Yea flora fossils. However, *Cooksonia* was a smaller and simpler plant than *Baragwanathia*, its Southern Hemisphere relative, and had no leaves.