



Professor George Weiblen recently visited the Royal Botanic Garden, Sydney

DIVERSITY IN NATURE

If gardeners can hybridise closely related plants to produce a new variety, what prevents species from intermingling in nature? Botanists through the ages have been intrigued by this question and have asked their favourite plants for answers.

My favourites are strangler figs. These magnificent trees of tropical rainforests also grace gardens worldwide. Moreton Bay fig (*Ficus macrophylla*) and Port Jackson fig (*F. rubiginosa*), with their impressive aerial roots, are two popular trees. An example near the Sydney Opera House, with branches that arch almost to the ground, attracted my attention during a visit to the Royal Botanic Garden, Sydney.

On that sunny afternoon in February, only a trained eye might have noticed that the green figs were teaming with tiny fig wasps known as *Pleistodontes froggatti*. Fig wasps use their stingers to lay eggs in flowers, and their offspring feed on the

seeds of young fruit. The fig is actually a hollow cavity containing many small flowers, accessible by a narrow pore at one end. Female fig wasps are expert at navigating their way inside while also delivering pollen to the flowers; males never leave the fig fruit. Pollen is collected at birth, when female wasps are hatched, mate with males of their species, then seek new figs in which to lay eggs. The wasps are dependent on their host plants for food.

HYBRID EXPERIMENT

Fig wasps will not pollinate or feed on just any fig. Although Moreton Bay and Port Jackson figs are close relatives, Port Jackson figs have a unique pollinator named *Pleistodontes imperialis*. We know that fig wasps can make mistakes and visit a fig of a different species from the one in which they were born, but we don't know whether cross pollination between the two species of figs could produce a new hybrid.

Professor James Cook, a fig wasp expert at the University of Western Sydney, and I attempted to find out by setting up an experiment with one of the Moreton Bay figs at the Garden. First, we glued shut the opening of the fig to prevent wasps from entering. Next, we punched a hole in the fig and inserted a narrow glass tube through which we could introduce either *P. froggatti* carrying Moreton Bay pollen

or *P. imperialis* carrying Port Jackson pollen. We repeated this on many figs to compare the fruit resulting from crosses within and between the two species. Each week, the Garden measures these figs while awaiting the fruit. We do not know what to expect but we're excited to learn if the two species can hybridise.

One reason for the experiment is to understand whether some of the diversity in nature could be the result of fig wasps finding new homes. Seeds from our experiment can be grown to observe the hybrids. A skeptical passerby asked me why anyone should care. I told him that diversity in nature is the key to survival for many species. It certainly is for the fig wasps that seem to make informed choices about where to live and how. Perhaps our own species will learn something.

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A narrow glass tube is inserted into the fig



Wasps are introduced into the fig through the tube