

can produce 40,000 seeds each season if all the flowers are pollinated.

But with completely separate male and female plants, not necessarily growing close together, *Dactylanthus* pollen must somehow be carried from the male flowers to the female flowers. It was essential to work out who or what was responsible for pollination and to make sure that they were not excluded by the possum enclosures.

At first insects were thought to be the most likely pollinators. Several different traps were used to find out exactly which insects were visiting the flowers. The only ones visiting regularly and in large numbers were the German and common wasps. The "host of small flies" around the flowers, referred to in earlier accounts of this species, was never seen.

Another aspect of the mystery was the pool of sweet tasting nectar noticed inside each inflorescence. The amounts seemed particularly large for a plant supposedly pollinated by small insects. Each inflorescence contained up to 1.5 ml of nectar, a lot for any type of flower. Furthermore, each male inflorescence lasted for 10-14 days, over which time it produced an incredible 5 ml of nectar. Nectar was produced constantly throughout 24 hours, giving no clue as to whether the plant was likely to attract a nocturnal or day-time pollinator.

WHEN A PLANT produces large quantities of nectar it usually means it has large pollinators. But what large native animal could be attracted to such dull coloured flowers, smelling like fermented corn and found only on the ground? Birds are generally attracted by brightly coloured flowers, rather than by smell, and although bright red and yellow *Dactylanthus* inflorescences have been found, these are rare freaks. Large insects such as weta are not known to feed on nectar.

This seemed to leave bats, lizards and tuatara – our only other large native land animals. The bat theory was strongly supported by a record of *Dactylanthus* pollen in guano from short-tailed bats in Northland's Omahuta Forest. This rare bat feeds on nectar and fruit as well as insects and, having evolved in the absence of terrestrial mammalian predators, is well adapted to feeding on the ground (see *Forest & Bird* August 1992).

Little Barrier Island was the only site where short-tailed bats and *Dactylanthus* were known to co-exist but *Dactylanthus* had only been found there twice in the last 40 years.

Then in 1991 came a report that *Dactylanthus* had been found on Little Barrier. On a hastily organised trip I managed to find only two live plants and

numerous dead ones in the general area suggested. The dead plants were the first indication that this island was not the safe haven for *Dactylanthus* that it was thought to be.

Another trip to Little Barrier was planned to resolve the pollination question. A special video camera was borrowed, with infra-red lighting for nocturnal monitoring and a time-lapse video recorder which could monitor a site for up to six days without human interference. The equipment was tried out for a night at Pureora where a ship-rat was filmed visiting, but not harming, female *Dactylanthus* flowers.

With some difficulty the heavy equipment was taken to Little Barrier Island in March last year. Only eleven plants were found, and only unopened buds. After a week of monitoring, the video caught a kiore or Polynesian rat chewing and damaging the nearly open buds. All the flowers produced from Little Barrier plants that season suffered this fate and there was no sign of bats near the plants.

THE BREAKTHROUGH occurred when the video equipment was subsequently set up in an area of magnificent native forest at Pureora. The tape captured a short-tailed bat fluttering onto a tree trunk,



A typical dull-coloured male *Dactylanthus* flower cluster just opening and showing off a mass of minute male flowers heavy with white pollen and surrounded by greyish "petals". These flower clusters, or inflorescences, are the only part of the plant that emerges above the ground.



A fully open female *Dactylanthus* inflorescence with brownish petal-like leaves surrounding hundreds of minute dark-purplish female flowers. A pool of nectar also collects inside these flower clusters.