

Unexpected bounty– quality and quantity of the nectar of the rootparasitic plant *Dactylanthus taylorii* (Balanophoraceae)

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Dactylanthus taylorii (Balanophoraceae), New Zealand's only native fully parasitic flowering plant, attaches to the roots of native trees and shrubs through an underground tuber. Its inflorescences produce copious amounts of nectar which attract the lesser short-tailed bat (*Mystacina tuberculata*) and a host of other native and introduced species as pollinators and browsers.

To understand the nutritional value of the nectar, its chemical composition was analysed for individual inflorescences over time, between different plants and populations. Nectar quantities were for the first time estimated on a population level, based on recent flowering data.

Dactylanthus nectar was found to be sucrose-dominant in young inflorescences, which is unusual for bat pollinated species where hexose (glucose and fructose) are more often the main sugars. During the 2-week anthesis, the ratio between sugars changed more towards hexose. We have assumed the change is due to environmental contamination, probably by microbes, but we have not proved it. Two sugar alcohols, not reported in other floral nectars, scyllo-inositol and myo-inositol, were also detected; both have been found to be beneficial to nervous function in animals. Alongside expected levels of sodium and potassium, *dactylanthus* nectar contained very high levels of calcium, confirmed as beneficial for bats to fulfil the high demands required for flight.

Total nectar volume produced by *dactylanthus* was estimated between 2.6 and 28 liters/ha/season for a healthy population, while the average energetic value of nectar was found to be 2462 J/ml, or 1231 J per inflorescence per day, between three and ten times higher than that of inflorescences of New Zealand bird- and insect-pollinated forest trees previously studied.

The high volume, high energy value and specific components confirm *dactylanthus* nectar as an important food source for bats and other flower visitors.