HONEYEATER MOVEMENTS AND THE FLOWERING CYCLE OF VEGETATION ON LITTLE BARRIER ISLAND

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INTRODUCTION

The data used in this paper to discuss the relationship between the local movements of honeyeaters (Meliphagidae) and the flowering cycle of the plants on Little Barrier, was gathered during a study of honeyeater ecology (to be published separately). From the regular observations made on the numbers of each species feeding in certain areas on different species of plants, it is possible to make some comments on the dependence each species of honeyeater shows on different nectar producing species, and how the nature of the flowering periods and nectar production of these plants affects the local distribution of honeyeater species from season to season.

METHOD

During the course of studies on feeding behaviour of birds on Little Barrier, regular observation patrols were made along a route which went from the homestead (20 feet above sea level) to an altitude of 900 feet on the Thumb Track. To complement this ridge section, the return half of the patrol passed down Waipawa Valley, and thus bird activity could be observed in both ridge and valley vegetation communities.

Three such patrols were made each month for twelve consecutive months (November 1967 to October 1968) as close as possible to the same period in each month. For comparative purposes, each patrol began about 0930 hours and relatively fine or calm days were selected. Notes were made on the feeding behaviour of each bird as it was first encountered and no attempt was made to follow any particular bird. By moving through the bird population it was possible to assess what proportion of each species were behaving in certain ways. Among the data recorded were the names of plant species from which the honeyeaters were taking nectar. Thus it is possible to say what plants in this particular area are used as nectar sources by the honeyeaters and, because the observations were made each month along a fixed patrol route, some comments can be made on the way in which the flowering cycle of the vegetation affects the local movements of the honey-eaters.

BIRD ACTIVITY ON THE RIDGE

Table 1 shows the number of honeyeaters present on the ridge section of the patrol during monthly samples and the number of these observations which were of birds taking nectar. It can be seen that the number of each species present on the ridge varies with the time of year. Although no measure of total nectar availability is possible, this change in population density is correlated to some extent with the type and amount of blossom on the ridge during each monthly

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TABLE 1 — The total number of honeyeaters recorded in the ridge section of the patrols compared with the number observed feeding on nectar.

	Tui		Bellbird		Stitchbird	
	Total	Feeding	Total	Feeding	Total	Feeding
January	16	9	12	4	5	5
February	3	2	20	3	1	-
March	-	-	14	-	1	-
April	4	1	12	1	-	-
May	-	-	12	1	3	-
June	3	-	11	-	1	-
July	3	3	17	4	3	-
August	23	16	11	9	9	8
September	12	11	18	13	10	10
October	16	4	10	5	-	3
November	15	3	9	5	-	-
December	11	9	22	19	3	3
Total	106	58	168	64	36	29

TABLE 2 — *Nectar sources of Tuis* — Number of birds observed each month on flowers of various plant species.

Plant Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Metrosideros excelsa	2										12	11
Metrosideros robusta	8											11
Vitex lucens		5	4	2	2	6	5	5	6	1	1	
Metrosideros fulgens			1	4	3	1	2					
Dysoxylum spectabile						1						
Pittosporum umbellatum								23	12			
Knightia excelsa									2	15	1	
Neopanax arboreum									1			
Phormium tenax											2	
Persoonia toru											1	
Total	10	5	5	6	5	8	7	28	21	16	17	22

TABLE 3 — *Nectar sources of Bellbirds* — Number of birds observed each month on flowers of various plant species.

Plant Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Metrosideros excelsa	5										7	17
Metrosideros robusta	1											11
Metrosideros perforata	1											
Vitex lucens	3	9	5	3	4	8	11	1	5	3	3	1
Schefflera digitata		1										
Phytolacca octandra				1								
Melicytus ramiflorus					1							
Dysoxylum spectabile						3		1				
Metrosideros fulgens						1	1					
Pittosporum umbellatum								11	11			
Nestegis spp. (Gymnalea)								1	1			
Cyathodes juniperina								1				
Corynocarpus laevigatus								2				
Alseuosmia macrophylla									1	1		
Neopanax arboreum									1			
Hebe sp.									1			
Knightia excelsa									3		1	
Cyathodes fasciculata										1		
Pittosporum tenuifolium										2		
Total	10	10	5	4	5	12	12	17	19	11	11	29

sample. Tuis, being wide ranging in their feeding habits, show marked changes in number. Bellbirds will also travel long distances to feed, but their insectivorous behaviour tends to make the monthly population counts more uniform, as many individuals are present on the ridge when no nectar is available. Stitchbirds however, seem to be more bound to a territory which provides all of their requirements. Typically such a territory seems to be centred in a valley, and the birds range up the sides of the narrow valleys on to the ridges when nectar is abundant there. Thus they are more frequently seen there in January *(Metrosideros robusta)*, August *(Pittorsporum umbellatum)*, September (*Pittosporum umbellatum, Alseuosmia macrophylla* and others), and to some extent in December *(Metrosideros excelsa)*. They do not seem to range as far from their breeding areas in search of food as do the Tuis or the Bellbirds.

TABLE 4 — *Nectar sources of Stitchbirds* — Number of birds observed each month on flowers of various plant species.

Plant Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Metrosideros excelsa												2
Metrosideros robusta	4											13
Metrosideros perforata	2											
Vitex lucens					1		6		1		2	
Schefflera digitata		2										
Metrosideros fulgens				1		1						
Pittosporum umbellatum								7	5			
Dysoxylum spectabile								2				
Alseuosmia macrophylla								1	5	3		
Hebe sp.									3			
Knightia excelsa									4	1		
Nestegis spp. (Cymnalea)									1			
Neopanax arboreum									1			
Total	6	2	-	1	1	1	6	10	20	4	2	15

PLANT SPECIES USED BY HONEYEATERS

The monthly total of observations made during each patrol of each species of honeyeater feeding on the nectar of different plant species are shown in tables 2, 3 and 4. These tables indicate the following points:

(1) There is a continuous flowering cycle of flowering plants, and even in winter there is always at least one flowering species available for the honeyeaters.

(2) Although there is continuity, the widest range of flowering species is during the spring and summer. The sudden flowering of *Pittosporum umbellatum* in August could be classified as the turning point from winter to spring. From this time on there does not appear to be any shortage of nectar until the following autumn. This sudden, large supply of nectar from *P. umbellatum* seems to coincide with the first signs of breeding behaviour of the spring.

(3) Some plants have a short flowering season and are in flower during only one monthly sample. Others flower for longer periods, and in the case of the puriri *(Vitex lucens)*, flowers are present almost all year round. *Vitex lucens,* which is plentiful in the valley communities, is a very important source of nectar and provides food at times when few other plants are flowering.

(4) Almost all nectar sources can be used by each species of honeyeater, but all species do not rely to the same extent upon the species of plant. The extent to which each species of honeyeater utilizes the different plants depends on their structural adaptations and their behavioural patterns. This aspect is dealt with in a separate paper.

(5) In conjunction with Table 1, it can be seen that when nectar becomes locally abundant so do the honeyeaters, which move in from neighbouring areas.

Many species of flowering plants grow in areas outside that which was regularly sampled, and when these come into bloom the birds are seen feeding on their nectar. The upper ridges have several species of rata which are productive nectar sources. *Metrosideros umbellata,* the southern rata, is abundant in the summit scrub and features as a dominant species in the vegetation over 1500 feet above sea level. This flowers profusely from late December through February. *M. albiflora* also flowers on the summit ridges in December and January, although this does not provide such a rich nectar source as *M. umbellata.*

Phormium colensoi, the smaller species of flax, flowers on the summit ridges during December. All three honeyeaters visit its flowers and in so doing become crowned with orange pollen. *Ixerba brexiodes,* abundant and often dominant over 1200 feet, is another favoured nectar source. It flowers from November to January and sporadically at other times. In the upper regions of the valleys and in the shady areas up to 1800 feet, *Fuchsia exorticata* is abundant and provides nectar from August to January, while its fruits (November to March) are favourite food items, especially of the Tuis. Also found in the rata/tawa forest is the wineberry *(Aristotelia serrata)* which provides berries that are much sought after in late summer and autumn.

Pohutukawa *(Metrosideros excelsa)* dominates the coastal regions, and its profusion of flower in November and December attracts many honeyeaters. However, the Stitchbirds rarely venture from the forest areas across the farm to pohutukawa along the shore. Elsewhere, where pohutukawa is continuous with the forest, Stitchbirds may be seen feeding from its flowers. Flax *(Phormium tenax)* is common on the cliffs and provides nectar during November, especially for the Tuis. Karo *(Pittosporum crassifolium)* is abundant in the coastal forest and flowers in August and September. Although it usually starts flowering just after *P. umbellatum,* it is just as keenly sought by the honeyeaters.

The garden around the homestead also provides food for the honeyeaters. Just about every type of garden flower is investigated by Tuis and Bellbirds, while fruit trees provide food, often when nectar is scarce. Figs, grapes, guavas and grapefruit are favourites, especially of the Tuis. Stitchbirds are rarely seen in the garden although occasionally females will venture there. There have been sporadic sightings of Stitchbirds feeding from orange blossom, figs, and the berries of *Pseudopanax lessoni* and *Melicytus ramiflorus.*

The amount of movement to and from nectar sources will largely depend on the amount of nectar being produced, which will

in turn depend on the amount of flowers present. Most plant species will have good and bad flowering seasons just as fruit trees will have heavy or light crops depending on the season. Furthermore, the starting and finishing time of flowering seasons is not always at the same time each year. Comparisons from year to year can only be made subjectively but the difference is often obvious and frequently considerable. Thus 1967 was a 'bad' year for *Knightia excelsa, Phormium tenax, P. colensoi,* and *Ixerba brexiodes,* and a 'good' year for *Metrosideros excelsa, M. robusta* and *M. umbellata.* However, almost the reverse was true for 1968. *Knightia excelsa* and *Phormium tenax* flowered particularly well, while *Metrosideros excelsa* was notably poor. On November 8th, 1967, it was noted that, "the majority of the *M. excelsa* is coming into full flower, especially around the coast, while some have been reported flowering for several weeks." Up until the time of leaving the island on November 7th, 1968, no *M. excelsa* had flowered at all.

Poor flowering of important plant species could have a marked effect on the success of honeyeater populations. This would be particularly important during early spring and critical for juveniles during the first periods of bad weather each autumn and winter. Success at such times would depend on the availability of alternative food sources and the adaptability of the species.

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SHORT NOTE

BIRDS CAUGHT BY HOOKGRASS

The entanglement of Silvereyes *Zosterops lateralis* and Hedge Sparrows *Prunella modularis* by hookgrass (*Uncinia* spp.) reported by Merilees (1969) and Hilton (1969) may not be quite as rare as these authors suggest. Although Hilton (1969) reported finding no hookgrass seeds on 21 Moreporks *Ninox novaeseelandiae* banded by A. H. Whitaker at the D.S.I.R. Orongorongo Valley Field Station, Turner (1937) reported a Morepork firmly caught by hookgrass on Kapiti Island. The bird was only released with difficulty after a cap was placed over its head to quieten it.

Other records from Kapiti Island include Tomtits *Petroica macrocephala,* Fantails *Rhipidura fuliginosa,* Whiteheads *Mohoua albicilla,* parakeets *Cyanoramphus* spp. and even a Long-tailed Cuckoo *Eudynamis taitensis* found entangled; and kiwi (*Apteryx* spp.) feathers were also frequently found in hookgrass after the birds had pulled free (Wilkinson and Wilkinson, 1952).

These earlier observations, with those of Merilees (1969) and Hilton (1969), suggest that this mortality may not be as uncommon as previously thought and clearly demonstrate that it is not just smaller birds which are liable to be caught by the tenacious *Uncinia.*

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