

SHORT NOTE

Claw colour in Great Spotted Kiwi

Much could be learnt about the status of kiwi populations if individuals could be aged accurately in the field. Chicks and juveniles present few problems because they are appreciably smaller than adults for their first 16-18 months of life. We can also distinguish young birds (≤ 5 years) from fully mature ones by X-raying their skeletons (Beale 1985, A radiological study of the kiwi. J. Roy. Soc. NZ. 15: 187-200). This technique, though, is not easy to apply in the field, and is not particularly useful. Adults with mature skeletons may be anywhere from 5 to 30+ years old, and the main requirement is to divide them into meaningful age classes.

In the Great Spotted Kiwi (*Apteryx haastii*) claw colour varies noticeably both within and between adults. Some birds have predominantly pale claws, with little or no pigment, while the claws of others are either entirely dark or streaked with various combinations of pale and dark stripes. The claws of North Island Brown Kiwis (*A. a. mantelli*) vary in the same way (M. Taborsky, pers. comm.; McLennan, pers. obs.) but those of the Little Spotted Kiwi (*A. owenii*) are uniformly pale (R. Colbourne, pers. comm.).

It is conceivable that the claws of both adult Brown and adult Great Spotted Kiwis change colour with age, in much the same way as human hair does. Our aim was to find out whether this happens in the Great Spotted Kiwi and to describe the variation in claw colour in three of their populations.

Between 1987 and 1992, we caught and examined 50 adult Great Spotted Kiwis in the forests of Northwest Nelson and the Paparoa Ranges. We recorded the predominant colour of each of their eight claws and noted the location, width and length of any pale or pigmented stripes.

We re-examined six kiwis after an interval of 9 to 32 months to see whether their claw colour had changed. These six birds spanned all of the variation present in the total sample of 50. When first caught, one had horn-coloured claws, one had dark claws, and four had claws with stripes. The original description for each bird was not referred to before it was examined again; in this sense, the two samples are independent. Further, in two cases ($\text{♀}2$ and $\text{♀}3$ in Table 2), the first and second descriptions were made independently by different observers.

RESULTS

Variation between populations

The claw colour of the Great Spotted Kiwis varied significantly between areas (Table 1). At Saxon River, midway along the Heaphy Track, 96% of kiwis ($n=23$) had claws which were either partially or completely pigmented. At Kahurangi Point, a few kilometres west of Saxon River, the frequency of birds with completely pale claws increased, although most of them (64%) still had stripes. Further south, in the catchments of the Oparara, Karamea, and Ohikanui rivers, the ratio reversed in favour of pale claws (81%).

TABLE 1 — Claw colours of Great Spotted Kiwis in different localities

Locality	N	% of kiwis with mainly		
		Pale Claws	Striped Claws	Dark Claws
Saxon River	23	4	83	13
Kahurangi Point	11	36	64	0
Southern NW Nelson & Paparoa Range	16	81	19	0

$\chi^2 = 25, P < 0.001$

Stability of claw colour

None of the six birds consistently gained or lost pigment in its claws over the time that we examined them (Table 2). Indeed, taking all of the birds together, there were no detectable changes in 39 (81%) of their 48 claws. The nine differences that we did record were small and spread over five of the six birds. Seven of these differences indicated a loss of pigment, either because a horn streak developed in a previously dark claw or because a dark stripe became narrower. Two claws gained pigment by developing a broader dark stripe.

The largest of these changes (a 1.2 mm reduction in the width of a stripe) may be real, but the others could well result from measuring error. The differences were skewed towards pigmentation loss – but not significantly so, assuming that we were just as likely to overestimate the width of a dark stripe as underestimate it ($X^2 = 2.7, P = 0.1$). Furthermore, the differences that we did detect appeared to be distributed randomly among individuals. If real changes were taking place, we would have expected them to: (1) be clumped within birds (perhaps old or young ones), (2) show up on the claws of both feet, and (3) increase with time (the interval between inspections). None of these predictions was fulfilled consistently.

DISCUSSION

The claw colour of Great Spotted Kiwis varies between populations, but seemingly not because of differences in age structure. Adults do not appear to lose pigment from their claws over time, and so birds with predominantly pale claws are not necessarily older than those with dark ones.

We recognise, however, that the intervals between our inspections may have been too short to detect slow, gradual changes in claw colour, especially if kiwis are much longer lived than is commonly believed. We intend to check this by remeasuring some birds in 5-10 years' time. But even so, we expect few changes. Our sample probably spans about 10% of an adult's life (assuming that they live for about 25 years), and our measurements were sufficiently detailed to detect a 10% change in claw colour, if it had taken place. Furthermore, T. Billing (pers. comm.) has not noticed any colour changes in the claws of his captive Brown Kiwis, even though he has observed some birds almost daily for a decade or more.

TABLE 2 — Changes in claw colour of Great Spotted Kiwis in Northwest Nelson. Interval refers to the time in months between the first and second inspections. Claws are numbered in sequence, beginning with the outer right (R1). Thus, R4 is the small hind claw on the right leg and L1 is the claw on the inner left toe. nc = no change. fs = faint horn streak developed. -X mm = reduction in the width of a dark stripe. + X mm = increase in the width of a dark stripe.

Bird No.	Interval (Months)	Claw No.							
		R1	R2	R3	R4	L1	L2	L3	L4
♂1	32	nc	fs	nc	nc	fs	nc	nc	nc
♀1	9	-0.3	nc	-0.6	nc	nc	nc	nc	nc
♂2	32	-0.1	-1.2	nc	nc	nc	nc	+0.5	nc
♀2	23	nc	nc	nc	nc	nc	fs	nc	nc
♂3	9	nc	nc	nc	nc	nc	nc	nc	nc
♀3	25	nc	nc	nc	nc	nc	+0.5	nc	nc

There is, however, one last glimmer of hope that claw colour might still be useful for aging adults, even if only crudely. Chicks of both Brown and Great Spotted Kiwis hatch with black claws (McLennan, pers. obs.; R. Goudswaard, pers. comm.) which subsequently develop adult coloration. These changes in early life show that claw colour is not fixed and hint at the possibility that other changes might take place later on. For this reason alone, it is worth re-measuring some of our original birds in 5-10 years' time.

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