Corella, 1995, 19(4): 115–117

CO-OPERATIVE CARE IN THE SINGING HONEYEATER *Lichenostomus virescens*

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Received 20 August, 1994

A rehabilitated juvenile Singing Honeyeater *Lichenostomus virescens* was observed in a suburban garden, approximately 15 km from its place of hatching, for 11 days. The juvenile was visited by at least one adult Singing Honeyeater more than 20 times, and was fed on nine occasions. In addition, a distraction display involving three adult Singing Honeyeaters was observed. This is the first published indication of co-operative care in the Singing Honeyeater.

INTRODUCTION

Co-operative breeding, a relatively rare behaviour, is defined as a reproductive system in which one or more individuals of a social group care for offspring that are not their own (Stacey and Koenig 1990). Sixty-five Australian bird species, of 20 families, are known to be co-operative breeders, although some have been infrequently or inconclusively documented (Dow 1980a). Of these, more than five honeyeaters (Meliphagidae) are regarded as well documented or regular communal breeders, while over eight species have only been recorded once or twice (e.g. Dow 1980a; Boles and Longmore 1981). Although it has been suggested that communal breeding permits individuals of a species to increase reproductive output at times when conditions are favourable (Rowley 1965; Harrison 1969), Dow (1980b) concludes there is no evidence to support the claim.

There have been many suggestions for the evolution of co-operative care. Williams (1966) and Price *et al.* (1983) propose that helping is misdirected parental care. It would be expected, if this were the case, that the helper would indiscriminately respond to any begging young of any species in the same vicinity. Reyer (1980) suggests that helping at a nest may increase the helper's chance of acquiring a mate. It has not been proved, however, whether those individuals who give assistance to a pair are more likely to be selected to mate than those who have offered no assistance (Clarke 1989). If begging young increase the likelihood of predation, it would be advantageous to a helper to tend a nest in its home range to reduce the attraction of predators to the area (Caraco and Brown 1986).

METHODS

Singing Honeyeaters *Lichenostomus virescens* are common over most of Australia west of the Dividing Range in woodland and scrubland habitats (Longmore 1991). On 12 August 1988, I was given a five day old Singing Honeyeater nestling to rehabilitate. The age of the nestling was determined by the actual hatching day. It had been rejected on 11 August 1988 from its nest in a suburban garden in Lynwood, Western Australia. Three attempts were made to place the young bird back in the nest, but each time the parent birds rejected it. I banded the young bird red on the left leg, blue on the right leg (known as RB hereafter) and relocated it about 15 km away in Kenwick, Western Australia, again in a suburban, but native, garden. RB was housed temporarily in a small metal-barred cage (60 cm × 45 cm × 40 cm) and kept primarily inside the house until it was 12 days old. RB was fed initially on a commercially available nutrient mixture (Complan) plus honey for the first four days, then supplemented with hand caught invertebrates for the following six days. The cage was put outside for a few hours during the day from 19 August 1988. RB was left in the cage until 24 August 1988, after which it was placed on top of the cage during the watch periods. I made observations from inside the house looking out of a window at the watch area. Time of day of observations and total number of observation hours were recorded, as well as all observations within a 20 m × 20 m area (Table 1).

OBSERVATIONS

Although I did not see an adult Singing Honeyeater interacting with RB until the latter was 16 days old (Table 1), there was evidence of attempted feeding two days before. Various dead invertebrates were observed scattered on the floor of

TABLE 1

Interactions between adult Singing Honeyeater/s and the relocated juvenile Singing Honeyeater (RB).

Date	Observer time	Total hours	No. of feeds by adults	No. of visits without feeds	RB's location
19/8/88	0800–1700 sporadic	1.5	0	0	in cage
20/8/88	0730–1330 sporadic	3.5	0	2	in cage
21/8/88	0730–1030 sporadic	0.8	0	0	in cage
22/8/88	1622–1700	0.6	0	1	in cage
23/8/88	0700–1000	3.0	4	1	in cage
24/8/88	0730–1010	2.6	2	1	on cage
25/8/88	0700–0920	2.3	1	3	off cage
25/8/88	1600–1715	1.2	2	1	off cage
26/8/88	0655–0800	1.0	0	1	off cage
26/8/88	1700–1730	0.5	0	1	in bush
27/8/88	0630–0700	0.5	0	1	off cage
27/8/88	1730–1800	0.5	0	0	in bush
28/8/88	0700–0730	0.5	0	2	in bush
29/8/88	0700–0730	0.5	0	0	not seen
08/9/88	1700–1710	0.2	0	0	off cage
TOTALS	—	19.2	9	14	—

RB's cage. These invertebrates were not residues from hand feeding as the cage was cleaned daily after feeding. At the same time, an adult Singing Honeyeater was seen daily within 50 m of the cage. An adult attempted to feed the caged young bird on 23 August by landing on top of the cage and dropping the food in or near RB's gape while RB gave gaping displays. Of four attempts observed on that day, only one was successful. A total of nine feeding instances were recorded over three days, four while RB was in the cage, five while out of the cage (Table 1). An adult, however, was present within 5 m of RB on eight of the 11 observation days.

On only one occasion (25 August, 0700–0920 h) were there more than one adult in the area simultaneously. Not only did an adult feed RB on that day, but distractive behaviour by three adults was observed at the time RB was being stalked by a domestic cat. This behaviour lasted approximately 60 sec., after which the cat vacated the area. The adult birds perched with RB for 4 min. while RB gave chirping calls almost continuously. Once the adults had moved out of sight, I placed RB in the cage and observations ceased.

During the afternoon of 25 August, I released RB after which it remained perched on top of the cage. After 26 min., an adult had arrived, and immediately RB gave a gaping display. The adult left. Four min. later an adult returned, carrying a fly (Diptera) in its bill, and fed RB. The adult then hopped to the top of a Callistemon bush 3 m away, perched for 6 min., then flew out of sight. A similar sequence was repeated 12 min. later when an adult Singing Honeyeater flew to the cage with an unidentified invertebrate in its bill, fed RB and left after perching on the same Callistemon bush for 2 min. Once the adult departed, no others were observed returning that day. RB, aged 19 days, was left outside for the night for the first time. During the following day (26 August) RB was observed hopping and attempting to hawk. Although an adult was seen with RB, it did not attempt to feed the young bird. RB was observed accompanied by an adult until 28 August, after which they were not sighted. However, 11 days later (8 September) a banded juvenile Singing Honeyeater was seen approximately 100 m away in bushland behind the property. Since no other singing honeyeaters had been colour banded in the area, I assumed it was RB.

DISCUSSION

I am unaware of any other published account of co-operative care in Singing Honeyeaters.

Although this account details a captive fledgling in an urban environment, the behaviour of the attending adults was not manipulated. It is possible that similar behaviour can occur in the natural environment. It is highly unlikely RB was related to the one or more adults that cared for it in the Kenwick garden. The nest in Lynwood continued to be tended by two adult Singing honeyeaters until a single chick fledged on 24 August 1988. It would be highly unlikely that the parents could tend both the nest and RB, 15 km apart, nor would it be likely that the adult birds are related to, or from the same social group as, the juvenile. It is therefore improbable that the helping behaviour displayed was due to kin selection. It is unlikely the behaviour can be explained simply as a response to a begging display because of the ongoing presence of several adults feeding and exhibiting distraction behaviour.

It appears most probable that the observations documented were a result of misdirected parental care (Williams 1966). While no nest was found in the study area or immediate surrounds, it may be possible that the adults tending RB were breeding in the area. Therefore, if a highly dependent nestling is placed within the home range of potentially breeding adults, it is possible that misdirected parental care could result. However, given that three adults were seen feeding and defending the nestling, it is likely that this species may well breed co-operatively in the wild at times.

A study of Singing Honeyeater behaviour in the natural environment could reveal if occurrences of co-operative care exist within the species. Since only a few species of Meliphagidae have been identified as using some degree of communal breeding in Australia, it may be of considerable interest to the development of co-operative care hypotheses in honeyeaters in the future.

ACKNOWLEDGMENTS

I thank Mr Walter Boles and Dr Richard Major for helpful comments on a draft of this paper.

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