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SHORT NOTE

Mutual feeding by the shining cuckoo (*Chrysococcyx lucidus layardi*) in New Caledonia

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The shining cuckoo (*Chrysococcyx lucidus*) occurs across Australasia, with 3 or 4 subspecies described (del Hoyo *et al*. 1997; Payne 2005). The subspecies *C. l. layardi* mainly breeds in New Caledonia and Vanuatu (Payne 2005; Dutson 2011). This subspecies parasitises the fan-tailed gerygone (*Gerygone flavolateralis*; Dutson 2011). Little is known about the breeding ecology and behaviour of the shining cuckoo in New Caledonia although its breeding biology has been studied in New Zealand and Australia (*e.g.,* Gill 1983, 1998; Brooker & Brooker 1989).

This note describes 2 observations of mutual feeding by the shining cuckoo at the Parc des Grandes Fougères (21° 37′ S, 165° 46′ E) on the mainland of New Caledonia. The Parc des Grandes Fougères is a 45-km² reserve, 300–860 m above sea level, and its vegetation consists mainly of medium-altitude rainforests, but secondary forests, scrubland, savannas, and pine plantations are also present. The park supports a rich and diverse flora and avifauna (Legault *et al*. 2012). The shining cuckoo is common in New Caledonia and abundant at the study site. There are *c.* 30–40 individual cuckoos at the study site and they often form flocks of 5–10 singing individuals, similar to the communal behaviour described for the subspecies of shining cuckoo in New Zealand (Watson & Bull 1950; Fitzgerald 1960; Friedmann 1968; Gill 1982).

On 5 Oct 2012 at 0755 h, a shining cuckoo perched on a *Carpolepis laurifolia* (*c.* 7 m from the ground) and within a few seconds a second individual approached holding a small insect (unidentified, but either a coleopteran or hemipteran). The second individual perched on the same branch and faced the same direction as the first individual but at a higher height. Soon after arriving, the second individual bent its head and gave the small insect to the first individual. The first individual stretched its neck to receive the insect and immediately swallowed it. Both individuals were silent throughout the interaction. The first individual also did not show any begging behaviours (*e.g.,* fluttering wings or opening the

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mouth). After feeding the first bird, the second individual flew away. The first individual remained on the same branch for a few seconds and then also flew away in the same direction as the first bird. We did not observe any other individuals around, nor did we hear any shining cuckoo vocalisations. The 2 individuals seemed to be isolated from the singing flock. Both individuals appeared to be adults because they had distinct stripes on the ventral plumage, while fledglings only have blurry stripes on the flank (del Hoyo *et al*. 1997). In addition, the shining cuckoo and the fan-tailed gerygone, the host of the shining cuckoo, mainly breed from Sep to Dec in New Caledonia (Barré *et al*. 2013). The first gerygone fledgling was observed on 8 Oct, and the first shining cuckoo egg was laid on 24 Oct at the study site (Nozomu J. Sato, *unpubl. data*). Thus, it was too early in the breeding season to expect any fledglings in the population.

On 19 Oct 2012 at 0852 h, about 20 m from the first observation, 2 individual shining cuckoos were observed moving around the tree canopy in a dry forest (5 m above the ground). They seemed to be looking for prey. One individual perched *c.* 4 m from the ground on a niaouli (*Melaleuca viridiflora*) and, after a few seconds, another individual came to the same branch and perched to the right of the first individual and in the same direction. It held a small insect in its bill. The second individual stretched its neck and gave the small insect (food item unidentified) to the first individual, which swallowed it. As in the first observation, neither bird made any sounds nor showed any begging behaviours. The second feeding individual flew away and the first bird immediately followed it. We did not observe any other individuals, nor did we hear any shining cuckoo vocalisations. Both individuals appeared to be adults because they had distinct stripes on the throat and the abdomen of their plumage.

Birds pass food to each other in 3 principal situations: adults feeding their young, courtship feeding to mates, and allofeeding among social group members (Smith 1980; Senar 1984). Several observations of mutual feeding of the other subspecies of shining cuckoo have hitherto been reported as courtship (*e.g.,* Stidolph 1955; Friedmann 1968), and adults of some subspecies of shining cuckoos have even been observed feeding conspecific fledglings (Friedmann 1968; Wyllie 1981). There are no reports of allofeeding by shining cuckoos; however, allofeeding has been observed in highly sociable bird species (Senar 1984) and shining cuckoos often form flocks and display communally. Therefore, it is possible that shining cuckoos feed group members. In sum, it is possible that feeding behaviour was directed either to mates, young, or a group member. However, in our observations, the donors and recipients were both likely to be adults. In addition, the feeding behaviours did not occur in a flock, but between 2 birds alone. This suggests that the feeding behaviour we report here was not directed towards fledglings but most probably towards mates.

Although our observations were most likely to be courtship feeding, we did not observe the begging behaviour described in other subspecies. The previous observations of other subspecies reported that the female was "cheeping" when fed by her mate (Stidolph 1955). One possible reason for the difference is that the begging behaviour of shining cuckoos is conditional. In some bird species, females do not always beg when fed, *e.g.,* red-breasted nuthatch (*Sitta canadensis*, Kilham 1973), bell miner (*Manorina melanophrys*, Poiani 1992), narcissus flycatcher (*Ficedula narcissina*), and Eurasian nuthatch (*Sitta europaea*, Yuji Okahisa, *pers. comm.*). Thus, the shining cuckoo might sometimes feed silently, similar to other bird species.

In conclusion, this is the first report of mutual feeding between *C. l. layardi*; however, further research is required to elucidate the breeding ecology and behavioural evolution of shining cuckoos.

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