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SHORT NOTE

Eurasian blackbird (*Turdus merula*) nest parasitised by song thrush (*T. philomelos*)

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Brood parasitism, in which a female lays her eggs in the nest of another individual, is best known as a driver of intricate coevolution between parasites such as cuckoos and their host species (Davies 2000). Facultative brood parasites are those that do not rely on their hosts to complete their life cycle, but occasionally lay eggs in the nests of others, generally of the same species. This has been recorded in over 200 bird species worldwide (Yom-Tov 2001). Here we report an unusual observation of a facultative brood parasite laying its eggs in the nest of a different, though closely related species. We also describe the subsequent behaviour of the host and the progress of the nest until its desertion.

The Eurasian blackbird (*Turdus merula*) and song thrush (*T. philomelos*) were introduced to New Zealand from Britain during the 1860s and 1870s (Gill *et al.* 2010) and both species are now common and widespread throughout the country (Robertson *et al.* 2007). Their breeding biology is similar: females of both species make similarly sized cup-shaped nests, lay 3–5 eggs and incubate them for 12–14 (blackbird) or 10–17 (song thrush) days, before provisioning nestlings in partnership with the male (Higgins *et al.* 2006). Blackbirds (84–120 g) are larger than song thrushes (58–85 g) and have larger eggs on average (blackbird: 29 × 21 mm; song thrush: 27 × 20 mm). The eggs of the 2 species also differ in colour and pattern: blackbird eggs are blotchy blue-green and red-brown, while song thrush eggs are bright blue, and flecked with black (Higgins *et al.* 2006).

Conspecific brood parasitism has been reported at low rates (< 5%) in both species, including a New Zealand population of song thrush (Samas *et al.* 2014). Experimental work has shown that both species tend to reject non-mimetic eggs added to their nests, both in their native range (Davies & Brooke 1989) and in New Zealand (Hale & Briskie 2007). Egg rejection in these species is thought likely to be an evolutionary response to past parasitism

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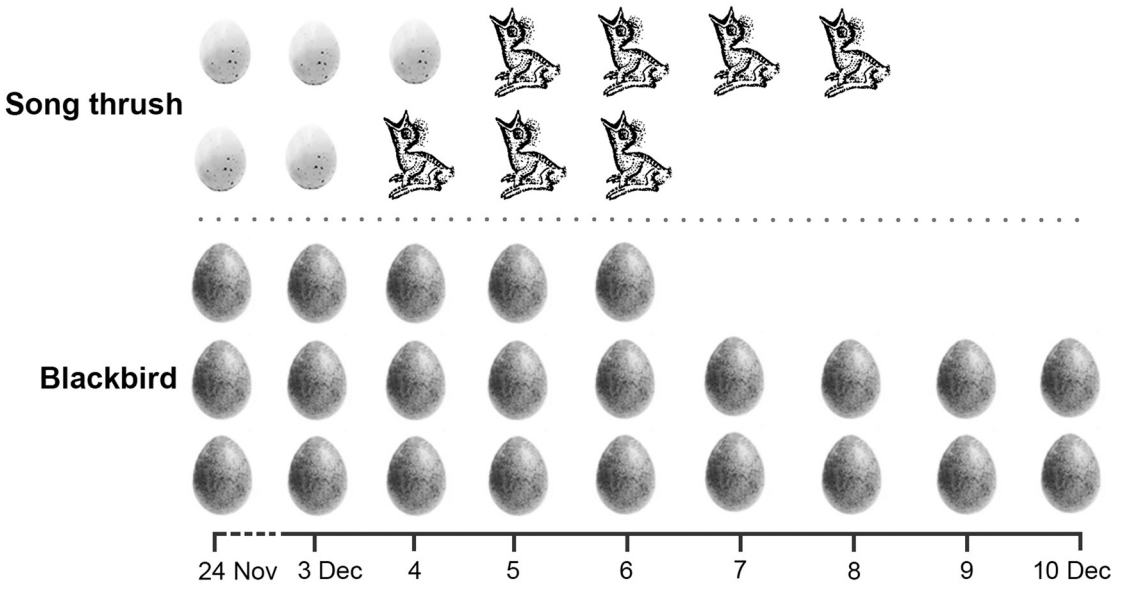

Fig. 1. Daily observations made at the blackbird nest following parasitism by a song thrush in November–December 2014. Illustrations represent the eggs and chicks of each species present in the nest with the date given below. The female blackbird deserted the nest on 10 December.

by the common cuckoo (*Cuculus canorus*), an obligate brood parasite sympatric with their British source populations (Davies & Brooke 1989). Thus parasitism between these 2 species, with their different eggs, might be expected to lead to egg rejection by the host female. To our knowledge there are no published records of it occurring.

On 24 November 2014 we found a blackbird nest at Kowhai Bush, Kaikoura (173° 37′ E, 42° 23′ S), containing 3 blackbird eggs and 2 song thrush eggs. The female blackbird did not reject the song thrush eggs and over the next 10 days incubated all 5 eggs. Fig. 1 illustrates observations made on the following days. The first song thrush egg hatched on 4 December (Fig. 2) and the second egg hatched the next day. The 2 song thrush chicks were observed begging on our subsequent visits to the nest. They appeared to be growing but were ejected separately on 7 and 8 December, respectively. One blackbird egg was also ejected, on 6 December. The nest and remaining 2 blackbird eggs were deserted by the female on 10 December.

On 7 December, with 1 song thrush chick and 2 blackbird eggs remaining, we video-recorded nest activity from 1445–1814 h. A Sony Handycam video camera (Sony Inc., Tokyo) was attached to a tree 11 m from the nest, at a height of 3.5 m. The brooding female left the nest 7 times during this period and returned with food at least 6 times (the bird's bill was not visible on the final visit). Time away from the nest averaged 426 sec (*sd* = 526 sec, *n* = 7). From the video recording, we could not determine whether the chick ate any food brought to the nest; on 2 occasions the female clearly attempted to feed it but after apparently failing, ate the food herself. We suspect that this may have occurred more than twice. From this brief observation period, we established that the female was both incubating her remaining eggs and attempting to feed the song thrush chick, but that she was unable to feed it on at least some attempts.

Our observation of a blackbird nest parasitised by a song thrush yielded a number of interesting questions. Firstly, why did a song thrush lay eggs in the blackbird's nest? Laying eggs in other nests can be adaptive in a variety of situations (Lyon & Eadie 2008). For example, a female may enhance her fitness by passing the costs of parental care onto another, especially if she is in poor condition. Alternatively, a female whose nest is predated while laying may make the best of a bad job by laying her remaining eggs in another nest. Either of these could have driven the parasitism we observed. The song thrush's decision to use a blackbird nest could have resulted from either a recognition error or a lack of available conspecific nests. Given the high rates of foreign egg rejection by blackbirds in this population (Hale & Briskie 2007), and the unsuccessful feeding and eventual ejection of the chicks we later recorded, an adaptive basis for choosing a blackbird host seems unlikely. Another song thrush would likely have made a better surrogate.

Hale & Briskie (2007) found that most blackbirds rejected non-mimetic model eggs of New Zealand's obligate brood parasites, the shining bronze-cuckoo (*Chrysococcyx lucidus*) and long-tailed cuckoo (*Eudynamys taitensis*). They interpreted this behaviour as an evolutionary relic of selection to reject foreign eggs in response to parasitism by British common cuckoos, as there are no records of blackbird nests parasitised by either New Zealand species of cuckoo. In light of their study, it was a surprise to observe this blackbird accepting and incubating song thrush eggs. If other blackbirds behave similarly it would suggest that Hale & Briskie's (2007) model eggs were rejected not because they were foreign but specifically because they were cuckoo eggs. This conclusion cannot be drawn from our one observation, but tests on more blackbird nests would be illuminating. A more likely explanation is that the blackbird host observed here represented one of the minority (16%) of individuals that Hale & Briskie (2007) found were acceptors, and that most would have rejected the song thrush eggs. Potential observers would be unlikely to notice this, which might explain the lack of similar records in the literature. This interpretation is further supported by recent evidence that blackbirds are often able to recognise and reject even the foreign eggs of other blackbirds (Samas *et al.* 2014).

Having accepted the song thrush eggs, the blackbird incubated them until each hatched, on 4 and 5 December. After this, on 6 December, only 2 blackbird eggs were found in the nest. We did not find the missing blackbird egg around the nest and can only speculate on reasons for its disappearance. While hatchling cuckoos are known to eject the eggs of their hosts (Davies 2000), song thrushes are not specialist brood parasites and the chicks are unlikely to have been capable of this. It may have been depredated, but this also seems unlikely as the remaining eggs and 2 song thrush chicks were unharmed. This suggests it was removed by the female, perhaps because of damage or because the chick hatched and then died.

Each song thrush chick went missing from the nest at 3 days old. Again, we did not find them around the nest, but consider predation an unlikely explanation as they were lost separately; more probably they died and were removed by the female. It is possible that at 3 days old, they had grown sufficiently to be recognised as foreign chicks. Some birds are able to recognise parasitic chicks and evict them from the nest (Sato *et al.* 2010; Tokue & Ueda 2010). As far as we know this ability has not been tested in blackbirds. Alternatively, the chicks may have been ejected because they had died. Our footage showed the female had difficulties provisioning the chicks, perhaps due to a mismatch in feeding cues or dietary requirements between the species. Song thrush chicks usually remain still and silent when approached; our observations of hungry chicks begging when we visited the nest support the interpretation that the nestlings starved and were subsequently removed by the blackbird as she would her own dead offspring.

Fig. 2. Photograph of the blackbird nest taken on 4 December 2014, showing a song thrush chick on the day it hatched, 1 song thrush egg (far right) and 3 blackbird eggs.

The female blackbird's desertion of her remaining 2 eggs at first glance may seem odd. However, it is likely that the hatching of the first eggs stimulated her to stop incubating. The subsequent death of the nestlings may have been the cue for this desertion: the death of a nest's only chicks generally constitutes a nest failure, making it adaptive for a parent to abandon that breeding attempt and conserve resources or nest again.

This rare record of parasitism of a blackbird by a song thrush has illustrated many of the puzzling behaviours associated with brood parasites. A better explanation of these events would only be possible with a properly replicated study, investigating whether blackbird females consistently accept song thrush eggs and how they respond to song thrush chicks. Nonetheless, our observations provide evidence that parasitism between these 2 species can occur in the wild, and thus could play some role in shaping the evolution of their breeding behaviour.

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LITERATURE CITED

Davies, N.B. 2000. *Cuckoos, cowbirds and other cheats*. London: T. & A.D. Poyser.

Davies, N.B.; Brooke, M.D.L. 1989. An experimental study of co-evolution between the cuckoo, *Cuculus canorus*, and its hosts I: host egg discrimination. *Journal of Animal Ecology 58*: 207-224.

Gill, B.J.; Bell, B.D.; Chambers, G.K.; Medway, D.G.; Palma, R.L.; Scofield, R.P.; Tennyson, A.J.D.; Worthy, T.H. 2010. *Checklist of the birds of New Zealand, Norfolk and Macquarie Islands, and the Ross Dependency, Antarctica*. Wellington: Te Papa Press.

Hale, K.; Briskie, J.V. 2007. Response of introduced European birds in New Zealand to experimental brood parasitism. *Journal of Avian Biology 38*: 198-204.

Higgins, P.J.; Peter, J.M.; Cowling, S.J. 2006. *Handbook of Australian, New Zealand and Antarctic birds. Volume 7: Boatbills to starlings*. Melbourne: Oxford University Press.

Lyon, B.E.; Eadie, J.M. 2008. Conspecific brood parasitism in birds: a life-history perspective. *Annual Review of Ecology, Evolution, and Systematics 39*: 343-363.

Robertson, C.J.R.; Hyvönen, P.; Fraser, M.J.; Pickard, C.R. 2007. *Atlas of bird distribution in New Zealand 1999-2004*. Wellington: Ornithological Society of New Zealand.

Samas, P.; Hauber, M.E.; Cassey, P.; Grim, T. 2014. Host responses to interspecific brood parasitism: a by-product of adaptations to conspecific parasitism? *Frontiers in Zoology 11*: 34.

Sato, N.J.; Tokue, K.; Noske, R.A.; Mikami, O.K.; Ueda, K. 2010. Evicting cuckoo nestlings from the nest: a new anti-parasitism behaviour. *Biology Letters 6*: 67-69.

Tokue, K.; Ueda, K. 2010. Mangrove gerygones *Gerygone laevigaster* eject little bronze-cuckoo *Chalcites minutillus* hatchlings from parasitized nests. *Ibis 152*: 835-839.

Yom-Tov, Y. 2001. An updated list and some comments on the occurrence of intraspecific nest parasitism in birds. *Ibis 143*: 133-143.

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