



Plate 1. Empty nest of Blood-breasted Flowerpecker, Gunung Merapi National Park, Java, 5 April 2008. Photograph: Adhy Maruly Tampubolon.

My observations ended when it started to drizzle. When I returned to the nest a week later, on 5 April 2008, it was empty, and neither the male nor the chicks were seen. It seems that the chicks had fledged.

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A predation attempt by an Oriental Cuckoo *Cuculus optatus* on Asian Stubtail *Urosphena squameiceps* nestlings

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Introduction

Avian brood parasites inflict fatal damage upon their hosts in various ways. Cuckoos and cowbirds remove or eat the host eggs when they parasitise nests, while, their nestlings usurp host parental care (Davies 2000). Moreover, adult cuckoos and cowbirds sometimes predate eggs and/or nestlings even when they do not parasitise nests (Wyllie 1981). Until the past decade, such predatory behaviour has only been observed (e.g. Alvarez 1995, Kinoshita & Kato 1995) or surmised (e.g. Bibby & Thomas 1985, Davies & Brooke 1988, Arcese *et al.* 1996) but not electronically recorded. Accordingly, there is insufficient data to discuss the ecological significance of predatory behaviour. This lack of data could be because brood parasites visit host nests only occasionally and for a short time (Davies 2000).

In recent years, however, because of technological advances in videography, the availability of video evidence has been increasing, especially in cowbirds (e.g. Elliott 1999, Pietz & Granfors 2000, Stake *et al.* 2004). In cuckoos, nevertheless, video evidence of such predatory behaviour is still rare (but see Kim & Yamagishi 1999, Briskie 2007). Moreover, most reports on predatory behaviour are limited to the Brown-headed Cowbird *Molothrus ater* and Common Cuckoo *Cuculus canorus*. Hence it is important to accumulate reliable and verifiable video data of various species to elucidate why such predatory behaviour has evolved in avian brood parasites.

To our knowledge, so far only three video recordings of predatory behaviour in Oriental Cuckoos *C. optatus* towards their hosts have been reported (Kawaji 2009, Chen *et al.* 2009, this paper). In 1996, Kawaji (2009) video-taped a case of Asian Stubtail *Urosphena squameiceps* nestling removal by a rufous morph adult female Oriental Cuckoo in Sapporo, Hokkaido (the video is available on the website of Movie Archives of Animal Behavior, data number:

momo110208cs03a, URL: <http://www.momo-p.com/showdetail-e.php?movieid=momo110208cs03a&flv=1>). In 2007, Chen *et al.* (2009) recorded an Oriental Cuckoo killing three three-day-old Grey-cheeked Fulvetta *Alcippe morrisonia* nestlings in central Taiwan. In 2010, we observed a similar case to Kawaji (2009) in the exact same area (c.50 m away from the 1996 nest-site) during an ecological study of Asian Stubtail. Here, we report a video-recorded predatory attempt by an Oriental Cuckoo on Asian Stubtail nestlings, which led to premature fledging.

Materials and methods

We conducted the study in a 0.32 km² plot in the Hitsujigaoka Experimental Forest of Hokkaido Research Center, Forestry and Forest Products Research Institute (42°59'N 141°23'E; altitude 100 m) from 21 April to 16 July 2010. This deciduous forest is dominated by white birch *Betula platyphylla* and Mongolian oak *Quercus mongolica*; most of the undergrowth consists of two bamboo grass species, *Sasa kurilensis* and *S. paniculata*.

The Oriental Cuckoo was previously considered a subspecies of the Himalayan Cuckoo *C. saturatus* but recently has been separated on vocal evidence (King 2005, Lindholm & Lindén 2007). In Central Hokkaido, the main host of the Oriental Cuckoo is the Japanese Bush Warbler *Cettia diphone* (Higuchi 1998). However, the Eastern Crowned Warbler *Phylloscopus coronatus* is the main host in the Hitsujigaoka forest located in Western Hokkaido, because of the low population density of Japanese Bush Warbler (Kamioki *et al.* 2011). The Asian Stubtail and the Oriental Cuckoo arrive at our study site for breeding in late April and early May, respectively (for breeding ecology of Asian Stubtail see Kawaji *et al.* 1996).

During the study period, we found 20 nests of seven potential host species, including eight nests of Asian Stubtail and one nest of

Eastern Crowned Warbler. Once located, the nests were monitored almost every day. One nest each of Asian Stubtail and Eastern Crowned Warbler was parasitised by Oriental Cuckoo. These parasitised nests and the nest in question were all located within a 75 m radius. A digital video camera (GZ-MG330, JVC, Japan) attached to a long-lasting battery (VU-V856KIT, JVC, Japan) was placed in front of all nine nests of Asian Stubtail and Eastern Crowned Warbler for recording activity from sunrise to sunset (c. 12 h) every few days until the fledging period. The total recording time for all nine nests was c. 405 hours.

Observations

We found a nest of Asian Stubtail under construction on 16 May; it was at this nest that we observed a predation attempt by Oriental Cuckoo. The female laid the first egg on 22 May and completed her clutch (six eggs) on 27 May. The nestlings hatched on 9 June and were reared by their parents and an extra-pair male. An Oriental Cuckoo approached the nest on 18 June at 13h21, just one day before the expected fledging date. The parents and the extra-pair male were absent at that time since they were foraging for their nestlings. When the cuckoo approached the nest, the nestlings crouched tightly. The cuckoo looked into the nest for few seconds and then appeared to attack the nestlings with its bill. All six nestlings flushed out, giving distress calls immediately after the approach of the cuckoo (Figure 1). This behavioural sequence video is available at the website of Movie Archives of Animal Behavior (data number: momo110607co01b, URL: <http://zoo2.zool.kyoto-u.ac.jp/ethol/showdetail-e.php?movieid=momo110607co01b&flv=1>). After this premature fledging, the male and extra-pair male visited the empty nest a few times with food. All the six fledglings survived and received parental care during the post-fledging period, at least until 20 June. No other case of cuckoo attack was observed at the other nests.



Figure 1. Predatory behaviour sequence of the Oriental Cuckoo on 18 June 2010. (a) A male Asian Stubtail feeding the nestlings. (b) An Oriental Cuckoo visiting the nest. (c) The cuckoo attacking the nestlings. (d) The male visiting the empty nest with food. Video footage is available at URL: <http://zoo2.zool.kyoto-u.ac.jp/ethol/showdetail-e.php?movieid=momo110607co01b&flv=1>.

Discussion

Why do cuckoos attack host nests? There are some possible explanations for this predatory behaviour. The nutritional benefits from egg-eating have been proposed (e.g. Davies & Brooke 1988), but recent studies on cowbirds indicate that nutrition is not the primary cause (e.g. Granfors *et al.* 2001). Zahavi (1979) hypothesised that parasites destroy eggs or hatchlings to enforce the acceptance of parasite eggs by those hosts that eject parasitic eggs. This 'mafia-like' retaliatory behaviour may indirectly contribute to positive feedback by the host, thereby increasing compliant hosts; it has been confirmed in two avian brood-parasites, Great Spotted Cuckoo *Clamator glandarius* (Soler 1999) and Brown-headed Cowbird (Hoover

& Robinson 2007). Another possible explanation is that the parasitic birds depredate non-parasitised host nests, which are discovered too late in the breeding cycle; this 'farming' behaviour thereby enforces re-nesting attempts of those hosts and enhances future parasitic opportunities. This behaviour has been systematically confirmed in the Brown-headed Cowbird (Hoover & Robinson 2007), but there is no direct evidence of it in cuckoos so far.

The aim of the predatory behaviour of the cuckoo observed in our study was apparently not nutrition. Moreover, we observed that the focal nest was unparasitised during the egg-laying period, thereby opposing the 'mafia' behaviour theory as well. Thus far, egg rejection behaviour in the Oriental Cuckoo's hosts, except for Japanese Bush Warbler (Higuchi 1989), has not been reported, indicating that this species is unlikely to experience selection for 'mafia' behaviour. In our study, the cuckoo sought to predate the host's nestlings one day before fledging. Nest predation by cuckoos in the late breeding stage seems not very effective to enforce host's re-nesting attempt. Additionally, at this study site, the parasitism rate of the Oriental Cuckoo on the Asian Stubtail is very low: only one of 67 nests has been parasitised by the cuckoo in a total of eight years (Kamioki *et al.* 2011). Furthermore, we could not confirm re-nesting in our case, although the hosts do re-nest when nests fail (Kawaji *et al.* 1996). Therefore, we do not have sufficient evidence to support the 'farming' behaviour.

In general, cuckoos' brood-parasitism involves some sophisticated behaviour; they lay eggs in their hosts' nests at an appropriate time (Davies 2000), and their egg-laying cycle is highly synchronised with their hosts (Moskát *et al.* 2006). Additionally, they show habitat and host preferences (Gibbs *et al.* 2000, Vogl *et al.* 2002). These characteristics seem to limit the time, area and host choices of cuckoos. We therefore suggest that the predatory behaviour of cuckoos, rather than being a form of 'farming', might be an adaptation whereby they adjust the host breeding cycle to their own in a home range.

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Heuglin’s Gull *Larus heuglini* on Wetar Island, Banda Sea: the first Indonesian record

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Gulls are not a regular feature of the avifauna of insular South-East Asia. Five species have been recorded in Indonesia (Sukmantoro *et al.* 2007, Marc Gardner pers. comm. 2009). Only one, the Common Black-headed Gull *Larus ridibundus*, has been recorded from Wallacea, with several records in northern Sulawesi since 1986 (White & Bruce 1986, Coates & Bishop 1997). The other species are likely to occur as vagrants during the Palaearctic winter. H. Kuhn observed a gull on Wetar Island during a September–October 1902 visit, but did not collect a specimen (Hartert 1904). It was speculated that Kuhn had probably seen Common Black-headed Gull (Bruce 1987). Remarkably, this is the only published gull record for the Lesser Sundas (covering the islands from Lombok in the west through to the Tanimbar archipelago).

During a 45-day survey (26 September to 9 November 2008) of the north and west of Wetar, Maluku province in the Banda Sea, we visited (on 12 occasions) a small estuary on ‘Sungai Besar’, about 400 m east of Lurang village (7°40′36″S 126°20′35″E) (see Trainor *et al.* 2009). Although the estuary is small, with c.2–3 ha of mangrove, lagoons, river mouth and stones and cobble, it supported a regionally rich array of Palearctic migrant shorebirds (18 species) including five species that are rare to uncommon in the Nusa Tenggara and Maluku regions (White 1975, White & Bruce 1986, Trainor 2005): Little Ringed Plover *Charadrius dubius*, Oriental Plover *C. veredus*, Little Curlew *Numenius minutus*, Great Knot *Calidris tenuirostris* and Sanderling *C. alba*.

On 30 October 2008, a gull (see photo *BirdingASIA* 12, p.85, Plate 1) was observed to fly over our (CRT & Imanuddin) heads and land on rocks near the mouth of the estuary. At the time we were unable to identify it, but between 07h30 and 08h30 we took about 20 photographs down to 15 m from the bird, and these were later sent

to several gull experts to assist with identification. The gull was silent and thirsty—it drank freshwater from the stream about 15 times. It flew off twice—after about 20 minutes, and again after 40 minutes of observation—and was not seen during two subsequent visits to the estuary on 31 October and 8 November.

Based on the bird’s large size, bare part coloration (with pale yellow legs), and plumage (combining a dark grey adult-type ‘saddle’ with worn brown wing-coverts and tertials, and an unmarked white head), the gull appeared to be in third-year type plumage (Ruud Altenburg pers. comm.), and it was eventually identified as a Heuglin’s Gull *Larus heuglini* (following Inskipp *et al.* 1996), here defined to include nominate *heuglini* and subspecies *barabensis* and *taimyrensis*. The plumage shown in Plate 1 in Trainor *et al.* (2009) is typical of immature faster-moulting large gulls, which include Heuglin’s and also Mongolian Gull *L. mongolicus* (N. Moores pers. comm.). Heuglin’s Gull is currently treated as a species by OBC (OBC 2009) but the IOC (<http://www.worldbirdnames.org/names.html>) include it with Lesser Black-backed Gull *L. fuscus* and BirdLife International include it with Herring Gull *L. argentatus* (BirdLife International 2010). Many gaps remain in our understanding of these (and other closely related) taxa, so its exact subspecific identity may remain unknown (Nial Moores pers. comm.).

Nominate Heuglin’s Gull breeds in western Siberia, on the Kanin Peninsula and Pechora Delta of the eastern Arctic (Liebers *et al.* 2001); *taimyrensis* on the Taimyr peninsula (Brazil 2009); and *barabensis* in south-west Siberia to south-east Urals, Baraba and the Kulunda Plains (Olsen & Larsson 2003). Of the three, only *taimyrensis* is regular and locally numerous in East Asia. However, the saddle of the Wetar Island bird appears darker than typical *taimyrensis*, and both the white-headedness of a third-year bird and the bill shape