Synchrony of primary moult in pairs of Common Mynas *Acridotheres tristis*

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Adult Common Mynas *Acridotheres tristis* (hereafter 'mynas') live in pairs throughout the year (Feare & Craig 1998), feeding, roosting and commuting between feeding and nocturnal roost sites together. Sengupta (1982) recorded ringed mynas with the same mate in consecutive years, and concluded that they mate for life and that bonding behaviour presumably plays an important part in pair maintenance.

During an attempt to eradicate an introduced population of mynas from Denis Island, Seychelles, *c.*950 were killed between May 2010 and March 2011, and in May 2014, 18 adult mynas were trapped on Mahé for use as live decoys on Denis, to facilitate further trapping there. Mynas were caught mainly using decoy traps in which a live decoy attracts free-living birds into compartments in the same trap. Once caught, the birds were killed humanely; their primary moult scores (Ginn & Melville 1984) were recorded and they were sexed by dissection. Birds caught on Mahé, however, were kept alive; in this case the larger bird of the pair was presumed to be male on the basis that males in the Denis sample were heavier and had longer head–bill length than females. During the trapping programme, some pairs (n = 12) of adults were observed approaching a trap together, entering the trap and being caught in the absence of other mynas in the vicinity. During processing, a similarity of stages of primary moult within these pairs of adults was noted. Pairs were caught in May–June, during the main period of wing moult.

To determine whether the similarity was indicative of synchrony of moult within pairs, or chance occurrence due to synchrony of moult within the entire myna population, the moult sequences of the known pairs was compared with those of unrelated birds selected from the database of trapped birds. The 12 unrelated duos were selected on the basis of being trapped on the same day as the mated pair, or if insufficient birds were trapped on the day the mated pair was caught, birds caught on the previous or following day were selected. One male and one female were selected, each from a different trap, in a different location and at different times of day in order to minimise the chance that the selected birds were mated.

The difference between the moult scores of the mated pairs was significantly smaller than the difference in moult scores of unrelated birds (Fig. 1: paired t-test, t = 4.45, P = 0.001, n = 12 mated pairs and 12 unrelated pairs). This indicates that moult in the mated pairs was more strongly synchronised than moult in the overall population; four of the 12 mated pairs were at exactly the same stage of primary moult, in four pairs the birds differed in the stage of only one developing feather, in three pairs two feathers were at different stages and in one pair three feathers were at different stages of growth. In the eight cases where pair members were at different stages of primary moult, in four cases males were more advanced than females, while in the other four females were ahead of males.

Synchrony of moult within mated pairs is probably a consequence of synchrony of other activities, especially breeding, which requires the pair to synchronise their readiness to initiate reproduction. Dawson (2006) showed that, in Common Starlings *Sturnus vulgaris*, initiation of moult was associated with a surge in blood prolactin concentration. In wild birds this surge normally follows gonad regression and decline in the concentrations of circulating gonadotrophic hormones. Experimentally, however, Dawson found that the prolactin surge and onset of moult could occur in the absence of gonad regression so that the link between cessation of breeding and onset of moult was not fixed. Furthermore, passerines in temperate regions have demonstrated flexibility in the date of onset and speed of their moult: birds that begin moult late replace feathers more rapidly than birds that begin earlier (Morrison *et al.* in press). Synchrony of moult thus need not necessarily be a consequence of a pair's breeding schedule and could have its own intrinsic advantages.

The breeding season and frequency of multiple broods in Seychelles' mynas have not been determined with precision. The equatorial environment in Seychelles (*c.*04°S) has little photoperiod variation and only two seasons, a drier south-east monsoon in May–October and a wetter north-west monsoon in November–April. Mynas breed mainly during the latter (Feare *et al.* 2015) but appear to do so over a prolonged period (Skerrett *et al.* 2001). In India, where the species is indigenous, mynas are believed to produce two, sometimes three, broods each breeding season (Lamba 1963, Ali & Ripley 1972) and this is also claimed to occur in the introduced population on Mauritius (Carié 1916 *in* Safford & Hawkins 2013), from which the birds introduced to Seychelles are derived (Skerrett *et al.* 2001). Multiple broods are suspected in Seychelles, but this has not been confirmed by studies of marked birds. Seychelles' mynas thus have a prolonged wet season during which they can potentially breed and during which Feare *et al.* (2015) found that they did not moult.

In the Denis population primary moult commences between March and May and the primary moult score increases steadily until August–September (CJF unpubl.), indicating that the period available for moult is also prolonged. The duration of an individual's moult within this overall timeframe is unknown. Nevertheless, the synchrony of primary moult between mated pairs is notable.

Apart from during incubation, when one member of a pair remains at the nest (usually the female: Feare & Craig 1998), pairs spend daytime together year-round, feeding and commuting to and from communal roosts in close proximity to each other. Foraging, preening and resting during the day are regularly punctuated by bouts of

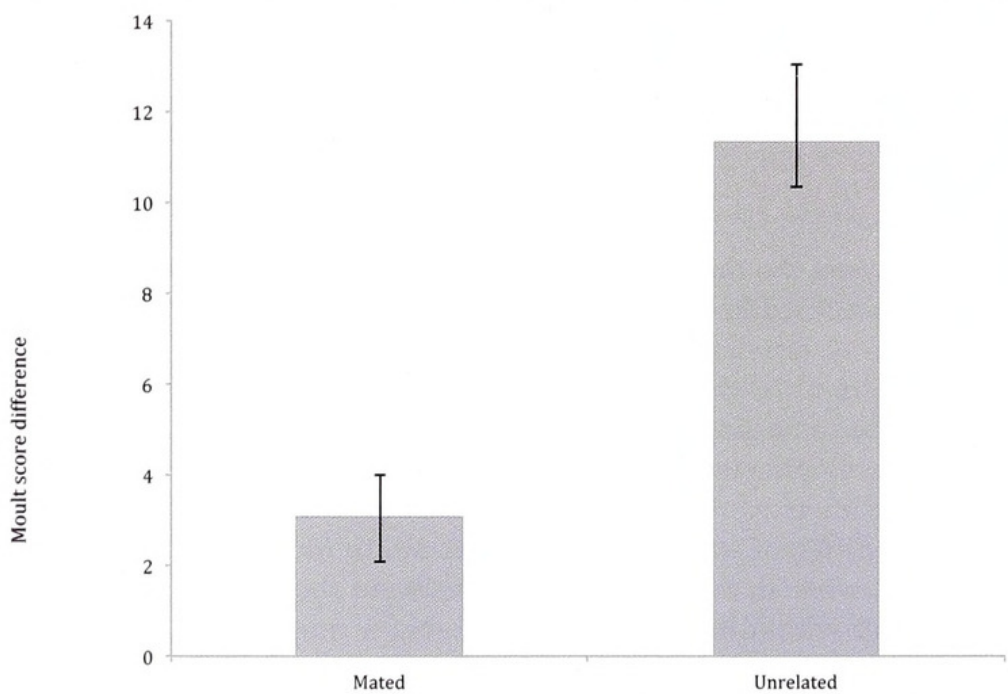

Figure 1. Mean differences (± 1 S.E.) between moult scores of mated pairs of Common Mynas (n = 12) and of unrelated pairs (n = 12) of birds extracted from the database of mynas caught on Denis Island (in May–June 2010 and on 30 May 2014), and on Mahé (birds caught 13–16 May 2014), Seychelles (see text for selection of unrelated birds).

display and calling. These behaviours doubtless maintain/reinforce the pair-bond all year and help synchronise activities in the absence of strong environmental cues. This can be advantageous for several reasons.

Foraging together, rather than alone, may be more profitable in terms of efficiency in locating food whose distribution and abundance varies in space and time. Foraging together can also facilitate food location in that walking pairs can disturb mobile invertebrates, making them more readily available. They can also feed collaboratively and can benefit from vigilance to disturbance that can render otherwise cryptic prey more available (e.g. when predating seabird eggs and when larger animals, including humans, cause disturbance: Feare *et al.* unpubl.), and may benefit from enhanced predator detection when together. In relation to moult, which is an energy- and nutrient-demanding process (Dawson *et al.* 2000, Dawson 2006), with specific amino acid and mineral requirements (Murphy & King 1992), synchrony could be valuable in that both pair members would have the same nutrient requirements contemporaneously and so could benefit from seeing where they each locate required foods. Simultaneous completion of moult could also ensure that both pair members are ready to commence a breeding attempt when suitable conditions arise.

Synchrony of moult could be a regular occurrence in bird species that maintain prolonged pair-bonds, but this aspect of moult does not appear to have been studied. In terms of control where myna populations are perceived to be invasive, it would be valuable to know whether disruption of pair-bonds, via removing one member of a pair, influences subsequent breeding success within the population.

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