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Female House Martin *Delichon urbica* provisions chicks at nests in two separate subcolonies

Theunis Piersma[1]



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An individually colour-ringed House Martin *Delichon urbica*, molecularly confirmed to be a female, after attending a first brood in early July 2007, became engaged with two second broods at the same time, one with the original mate of the first brood. The two nests were at opposite sides of the same building and not within each other's sight. During simultaneous observations on 1 September, the female was feeding large nestlings at each of the two nests, alternating between bouts of repeated feeds. This behaviour by a female with perhaps below-average survival prospects (she had a slightly damaged wing tip and a low weight at first capture) can be interpreted as a case of helping relatives or polyandry.

Key words: colour ringing, Hirundinidae, mating system, parental care, social behaviour, swallows

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Introduction

Swallows and martins (Hirundinidae) in general (Turner 2004), and House Martins *Delichon urbica* in particular (Cramp 1978, Glutz von Blotzheim & Bauer 1985), are firmly classified as socially monogamous, the most common mating system among passerines (Møller 1986, Bennett & Owens 2002). According to Turner (2004), in swallows "rarely, a male will acquire two mates, but he will then generally give help almost exclusively to one of them". Nevertheless, it is well established that during the breeding season, between first and second broods, House Martins quite readily change mates (von Gunten 1963, Hund & Prinzinger 1979). Such mate change tactics illustrate the increasingly appreciated degrees of individual flexibility and opportunism in mating systems (e.g. Ligon 1999), and with respect to the social life of House Martins there may well be more under the sun than has met the ornithologist's eye. Here I present such a surprising case of reproductive behaviour, discovered after only a single season of individually marking House Martins, of a female provisioning chicks at two separate nests.

Study site and methods

This study was carried out at my house in Gaast (53°01'N, 05°24'E), province of Friesland, The Netherlands, in July–September 2007. It is based on observations at two subcolonies, 35 m apart and out of each other's sight, at the north (7 occupied natural nests) and at the east side (30 occupied natural and 2 occupied artificial nests) of the house. In addition, on 10 days between 11 June to 4 August I captured adult and recently fledged House Martins using a variety of methods: mist-

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netting in late afternoons and early evenings before nightfall, using small fishing nets at the entrance of individual nests during daytime, and catching birds leaving their nests at dawn after paper-plugging their nest entrances. As soon as possible, and always within 1.5 hour after capture, the birds were processed and released. The birds were first ringed with an aluminium ring at the right tarsus and weighed to the nearest 0.1 g on an electronic balance. A droplet of blood was collected from the brachial vein and stored in 96% alcohol at –20ºC before DNA extraction, and the sex of all birds was established with molecular assays (Piersma & van der Velde, unpubl.). To avoid disturbance and damage to the nests placed as high as 3–5 m above ground level, I made no attempts to ring and bleed nestlings, and thus prevented molecular assignment of parentage.

Rheinwald & Gutscher (1969) stated that "Farbberingung kommt bei Mehlschwalben nicht im Frage, weil die Ringe kaum zu sehen sind". However, as I had the impression that combinations of two narrow colour rings at either of the two tarsi should be visible and readable during nest-building (for birds returning one or more years later) or during chick-provisioning visits to the nest (later in same season), I applied two 3.3 mm high colour rings on the left tarsus in 19 adult males and 20 adult females. Individual ring combinations were carefully prepared in advance to ensure that mistakes during ring applications were impossible. The observers involved were perfectly able to distinguish the colours used, and no ring loss was noticed during the season. The three birds discussed in this note were ringed with the following colour combinations: two pink rings (a female captured on 8 July at nest North 8, code = lPiPi), a pink above a dark green ring (a male also captured on 8 July at nest North 8, code = lPiGn) and a dark green above a yellow ring (a male captured on 5 July at nest East 4, code lGnY).

From mid-April onward, at least once, and often twice a week, I spent about an hour at the east subcolony and a quarter of an hour at the north subcolony, making general records on the progress of nest building, the presence and the size of any chicks, and the general activity of the parent birds. After the first colour rings had been applied in mid-June, I spent time trying to resight the individuals. It soon became clear that, in order to read colour ring combinations in the instant of time (a second or less) available when birds were at the nest entrance (either going in or out, or during chick feeding) with 10×40 binoculars, one had to have that single nest or a series of nests in focus. This obviously limited the number of nests that could be scrutinized, but of the 39 colour-ringed adults, 35 were resighted sometime after capture on 1–17 occasions with an average resighting rate of four different days after capture. Sometimes, recently fledged birds, easily identified on the basis of the white trailing edges of their tertials (Cramp 1978), were seen at nests.

To establish that a single female indeed was provisioning chicks at two different nests, North 8 and East 4, on 1 September the two nests were watched simultaneously for an hour between 14:00 and 15:00.

Results

The female around which this story revolves, lPiPi, was first captured on 8 July at a nest called North 8 with a body mass of 16.1 g. She carried a louse-fly (Hippoboscidae, Diptera; as 10–15% of the adults do) and her left two outer primaries had a bend at the tip (to the best of my assessment not caused by catching or processing). lPiPi was recaptured in a mistnet in front of the colony on 4 August and by then she had gained 2.1 g and weighed 18.2 g. Her mate lPiGn was also captured on 8 July and was even lighter (15.8 g), with no louse-flies noticed. When recaptured on 4 August together with lPiPi, lPiGn also had gained mass, weighing 18.6 g. On 8 July the birds had large nestlings, and on 4 August they were probably late in the incubation of the second clutch. The third individual in this story, male lGnY, was captured on its nest (East 4) on 5 July.

North 8, built on the remains of a nest from the previous year, was the largest nest at the colony in 2007. By 24 May the nest was complete, and on 23 June House Martins were regularly

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coming in and out, suggesting the presence of small chicks. The first time small nestlings were seen at the nest entrance was on 27 June, and on 4 July I noticed intense feeding of at least two rather large chicks. On 8 July the two parents were captured at dawn when leaving the nest entrance after the paper-plug was removed, but the young did not try to get out and were not captured. That same day, at 12:14, both freshly colour-ringed parents were seen at the nest entrance as they fed the nestlings. On 18 July lPiPi was again seen at North 8, and both lPiPi and lPiGn were recaptured at the northern subcolony on 4 August in a mistnet. On 10 August, birds were quickly going in and out suggesting a brood of small chicks.

East 4 was also built on the remains of a nest from the previous year, and on 23 June (same date as North 8!), the rapid ins and outs of adult birds suggested the presence of small chicks. On 4 July I noticed the provisioning of two or more large chicks, and on 5 July at dawn I captured the only bird leaving the nest at dawn, male lGnY. This bird was observed to feed chicks that same evening at 19:37. At least two large chicks were seen at the nest entrance on 7 July. On 18 July I noticed two adults at the nest entrance, with lGnY clamped to the wall below the nest and engaging in a fight at the nest entrance. On 22 July an unringed adult went in, and another came out. On 28 July I saw an unidentified (but not necessarily unringed) adult coming out, and one going in, and on 5 August an adult went in and stayed in, suggesting that incubation was going on. On 10 August (note similar date in North 8), the regular going in and out of adults suggested the presence of small chicks. On 19 August I first noticed half-grown chicks being fed by lGnY, and on 20 August begging chicks were seen at the nest entrance.

On 26 August interesting things began to happen. From 9:40–10:10 no fewer than five times the begging large chicks were fed by an unringed juvenile House Martin suggesting the presence of young helpers at East 4. With interest peaking, from 10:35–11:30 I twice noticed the presence of lGnY provisioning the chicks, but now, for the first time, lPiPi also seemed to be present at the nest entrance of East 4 feeding chicks. I found this hard to believe, so I continued the watch, and at 11:21 I again saw lPiPi feeding young at East 4!

Only on 1 September I had the opportunity to continue the observations. From 11:43–12:20 at nest East 4, lPiPi was seen feeding chicks five times, whilst during the same interval lGnY also made five feedings. With attention focused simultaneously at the east and the north colony from 14:00–15:00, from 14:00–14:15 lPiPi was feeding chicks five times at North 8 (Fig. 1), while partner lPiGn made four feedings during that time. At 14:18 lPiPi made a visit and perhaps made a feed to East 4, but from 14:25–14:35 the bird was back at North 8 providing two feeds (partner lPiGn doing one). During the rest of the hour no visits to either nest were recorded.

Discussion

The unlikely observation of a female House Martin that provisioned large nestlings at two nests can only be upheld if it is certain that: (1) I only applied a single ring combination with two pink rings, (2) a bird with two pink rings at the left tarsus was positively observed (rather than thought to be seen at) each of the two nests, and (3) lPiPi was actually a female and not a male. Although there is no doubt in my mind that these conditions are fulfilled, here is what I can offer as 'proof'. (1) I carefully prepared colour-ring combinations beforehand, putting two rings of similar or different colours on the same stick so that no confusion could arise, and that no colour-ring combinations would be applied twice. With two pink rings, the colour of upper and lower positions cannot be confused. (2) Although doubting myself at first, multiple observations at both nests, corroborations of these observations by a second observer, as well as the eminent visibility of two pink rings (see Fig. 1), in my view rules out the possibility of misidentification. Note that often the two pink rings could be positively identified as two, with a small dark margin between them. (3) The molecular essay was verified in different ways (Piersma & van der Velde, unpubl.) and for lPiPi the essay was repeated and the sex confirmed.

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Figure 1. Female lPiPi feeding a large nestling at North 8 in the afternoon of 1 September 2007, the nest where she also raised her first brood (photo T. Piersma). See www.ardeajournal.nl for a full-colour version of this picture.

If we accept that female lPiPi was indeed provisioning two second broods in late August and early September, what made a member of a species where social monogamy is the rule, and only polygamy by males is regarded as a possibility (Turner 2004), engage in such apparent polyandry? Apparent, as we have no proof that lPiPi was actually the mother of the chicks in either North 8 or East 4, or involved in the incubation of the latter clutch. What we know is that perhaps lGnY had lost its partner by the time he was captured on 5 July, that there were fights near East 4 on 18 July, that an unringed adult entered it on 22 July, and that no unringed adult was provisioning the nestlings in East 4 during the intense observations in late August or on 1 September (although an unringed juvenile did come to feed). If any partner of lnGnY had replaced in late July, at least in principle there would still be enough time for lPiPi to lay a clutch (1 week), help incubate it (2 weeks) and ensure that by 1 September there were large nestlings to be fed (another 2 weeks).

Perhaps, (1) this was a case of helping (Bryant 1975 claimed that first-brood young may help the rearing of second broods, there was an unringed juvenile coming to feed at East 4) by an adult female at the nests of relatives (Rheinwald 1975's documentation of extreme site fidelity suggest tight kinship relationships within House Martin colonies). Perhaps, (2) lPiPi became seriously engaged with a second partner (lGnY) because he had lost his first mate by then. For both interpreta-

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tions her 'state' may be relevant: lPiPi was relatively lightweight in early July, had a bent wing-tip (a situation that neither had become worse nor better by the time she was recaptured on 4 August) and carried at least one louse-fly. In such a state she may have made the best of a bad situation either by providing help to relatives or by investing in two second broods. However, for lPiPi to be the mother of all chicks, in view of the synchrony of the two second broods, she must have laid the eggs in both nests during an overlapping series of days, and this is an unlikely scenario for any female House Martin, let alone a somewhat handicapped bird (see Bryant 1975). In any case, if the survival prospects were indeed poor, lPiPi would have been evolutionary advised to salvage fitness by working very hard for the sake of offspring of close relatives (scenario 1) or her own (scenario 2), even at the risk of further shortening whatever was left of her own life (Bryant 1979).

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SAMENVATTING

Om meer te weten te komen over het sociale gedrag en de jaarlijkse overleving van Huiszwaluwen *Delichon urbica*, begon ik in de zomer van 2007 met het individueel kleurringen (met twee 3,3 mm hoge kleurringetjes aan één van beide tarsi) van Huiszwaluwen. Van de 39 gekleurringde adulten werden er diezelfde zomer niet minder dan 35 teruggezien, de meeste tijdens de fractie van een seconde dat ze aan het nest hingen om hun jongen te voeren. Hoewel Huiszwaluwen als strikt sociaal monogaam en als 'non-helpers' te boek staan, werd het mij in de loop van augustus duidelijk dat een vrouwtje dat tijdens het verzorgen van de jongen van haar eerste broedsel samen met haar man was gevangen, naast het voederen van een tweede broedsel samen met diezelfde man in haar oorspronkelijke nest aan de noordzijde van het huis, ook jongen van een tweede broedsel voerde in een nest aan de oostzijde van het huis. Simultane waarnemingen op 1 september bevestigden dat deze vrouw, lPiPi ('left pink pink'), afwisselend een aantal voederbezoeken bracht aan de jongen op beide nesten. Bij vangst was dit vrouwtje heel klein en licht, had ze een beschadigde linkervleugeltop en droeg ze ten minste één luisvlieg mee. Misschien zag het er daarom slecht voor haar uit, en deed ze een poging om haar slechte toekomstperspectief te compenseren met (1) het helpen verzorgen van de jongen van familieleden, ofwel (2) een dubbele tweede broedpoging.

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