Observation of female-male mounting in the carrion crow

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Abstract

We report an observation of a female carrion crow, *Corvus corone corone*, mounting her long-term, pair-bonded, male partner. The report highlights the importance of more systematic quantitative studies of rare socio-sexual behaviours, which could provide important insights into the evolution of non-conceptive socio-sexual behaviours.

Key words: anecdotal observation, carrion crow, female-male mounting, non-conceptive sexual behaviour.

Introduction

Non-conceptive sexual behaviours, *e.g.* same-sex mountings or ritualised greetings involving sexual gestures, are describe in a wide variety of species (reviewed in: Sommer & Vasey, 2006; Bailey & Zuk, 2009; Marco, 2017). Such behaviours have been suggested to play an important role in maintaining social relationships (Faraut, Northwood, & Majolo, 2015), provide practice of courtship behaviours (Manson, Perry, & Parish, 1997), or might be 'behavioural errors', such as mistaken identity (Bailey & French, 2012; Macchiano, Razik, & Sagot, 2018). Not so much scientific attention has been drawn to so-called 'reverse mountings', *i.e.* females mounting male individuals, although they are described in a number of different mammal (reviewed in: Dagg, 1984) and bird species (reviewed in: Nuechterlein & Storer, 1989). Reverse mountings in monogamous, long-term bonded species, can also be an integral part of courtship behaviour, as for example in different species of grebes (Nuechterlein & Storer, 1989).

Here, we describe an observation of a female carrion crow mounting her pair-bonded male partner. Carrion crows form long-term socially monogamous pairs (Meide, 1984; Glutz von Blotzheim, 1985). The social system of carrion crows is flexible, including territorial pairs, non-breeder flocks, and cooperatively breeding groups (Wascher, 2018). Carrion crows are monomorphic, but adult birds can be sexed with relatively high certainty based on biometrics, with males being slightly larger (Slagsvold, 1982; Fletcher & Foster, 2010), and behaviourally, as males are described as more aggressive compared to females (Richner, 1989; Chiarati et al., 2010). With the exemption of incubation and brooding, which is exclusively carried out by the female (Baglione & Canestrari, 2016), both sexes engage in parental care, *e.g.* nest building (Baglione & Canestrari, 2016), nest defence (Bossema & Benus, 1985), chick feeding (Canestrari, Marcos, & Baglione, 2005), nest sanitation (Bolopo et al., 2015).

Methods

The reported anecdote was observed in a population of captive carrion crows, housed in a large outdoor aviary in northern Spain (for further details on the population see: Wascher, Canestrari, & Baglione, 2019). In 2013 and 2014 a number of different studies on socio-cognitive abilities (Wascher et al., 2015) and social behaviour (Wascher, Canestrari, & Baglione, 2019) of carrion crows have been conducted in this specific population. Keeping crows in captivity and the procedures performed were authorized by Junta de Castilla y Leon (núcleo zoologico 005074/2008; EP/LE/358/2009).

The observation described in this manuscript was recorded by CAFW when visiting the aviaries outside of systematic data collection, during the breeding season in April 2013. The observed pair of crows were hand-raised in 2010. Birds had been well habituated to the presence of CAFW since January 2013 and regular focal observations were conducted with caution to minimise disturbance to the focal birds. Nesting material was provided to pair-housed birds during the breeding season, and nest checks were conducted from a distance, with a specialist mirror pole, when the female was off the nest. Sexes of the focal individuals for the present report were determined by body and beak size dimorphism (Figure 1). Male crows of various species have been reported longer and wider bills compared to females (Slagsvold, 1982; Fletcher & Foster, 2010). Sexing based on bill morphology was considered a valid method among the authors; ten sets of pictures showing five different male-female pairs were blindly judged by FH and sexes were correctly assigned in 90 percent of the pictures. The sexes of the focal individuals were also confirmed behaviourally (higher frequency of aggressive behaviours recorded in the male, female was observed incubating eggs; CAFW and FH personal observations).

Results

We report an observation made during the crows' breeding season. On 26th April 2013 in the early evening (approximately 18:30 CEST), CAFW observed a long-term pair-bonded dyad of carrion crows performing a courtship display, in which the female individual mounted the male individual (Figure 2). The photographs show the male individual crouching down, potentially to invite the female to mount on top of him (Figure 2a-c). Once mounted, the female performed a beak-touching display (Figure 2 d-m). The pictures do not allow to clearly tell whether there is cloacal contact at any point of the interaction, but we assume that there was none, which would differentiate the reverse mount from a copulation. After the mounting, both the male and the female engaged in a display similar to post-copulatory displays which CAFW had previously observed in common ravens (CAFW, personal observation), however the display was very short and it is not well captured in the photographs (Figure 2 p-q).

The focal individuals had two failed breeding attempts during the breeding season of 2013. The female was repeatably reported on the nest since 15th April 2013 and was assumed to have started incubation. However, she appeared easily disturbed and was regularly seen off the nest. By 26th April, when the reported observation was made, she had completely abandoned the nest and egg shells were found on the ground. The focal female was again regularly seen on the nest from 3rd of May onwards and the nest had two eggs on 6th May and four eggs on 10th May. On 14th May, only one egg was left in the nest and the focal female was not observed on the nest anymore.

Discussion

Empirical studies on copulatory behaviour in corvids are very rare, probably due to the fact that sexual behaviours are brief and copulations in corvids occur both on the ground and in trees (Birkhead et al., 1992), making it difficult to systematically investigate. One study in American crows, *Corvus brachyrhynchos*, studied the relationship between extra-pair paternity and extra-pair copulations. 71 broods were monitored via nest cameras and additionally 99.6 hours of focal observations were conducted during nest building, egg laying, and incubation, but despite the large observational effort, only six within-pair and 15 extra-pair copulations were observed over the course of the study period (Townsend, 2009). In our study population, in approximately 100 hours of focal recordings between 2013 and 2014 and many more hours of behavioural observations during experiments and animal keeping duties or habituation of crows, no other incidents of courtship behaviours or mating had been observed. Additionally, to the difficulty to spot courtship behaviour, in monomorphic species it is further difficult to determine the sex of the involved individuals.

To our knowledge, there is no quantitative data on the frequency and variety of courtship behaviours (both non-conceptive mountings and male-female copulations) in corvids available. Such data are needed to test different hypothesis about potentially evolutionary drivers of non-conceptive sexual behaviour (Bailey & Zuk, 2009). We cannot exclude that reverse mountings are a regular element of courtship behaviour. Alternatively, given that the reversed mounting reported here was recorded after a failed breeding attempt, it is possible that reverse mountings play a particular role in maintaining and strengthening the pair-bond (Birkhead, Atkin, & Møller, 1987).

The focal pair has never successfully raised offspring together, neither in the year of the observation, or before or afterwards. Captive conditions such as disturbance by other crows in neighbouring aviary compartments is likely to have contributed to unsuccessful reproductive attempts. Age and limited experience did probably did not account for the failure in breeding attempt of the focal pair, as another pair of the same population and the same age as the focal pair successfully bred in 2013.

Our observation illustrates the importance of more systematic investigations of rare social-sexual behaviours, which might potentially hold insights into an understanding of evolutionary drivers of non-conceptive sexual behaviours.

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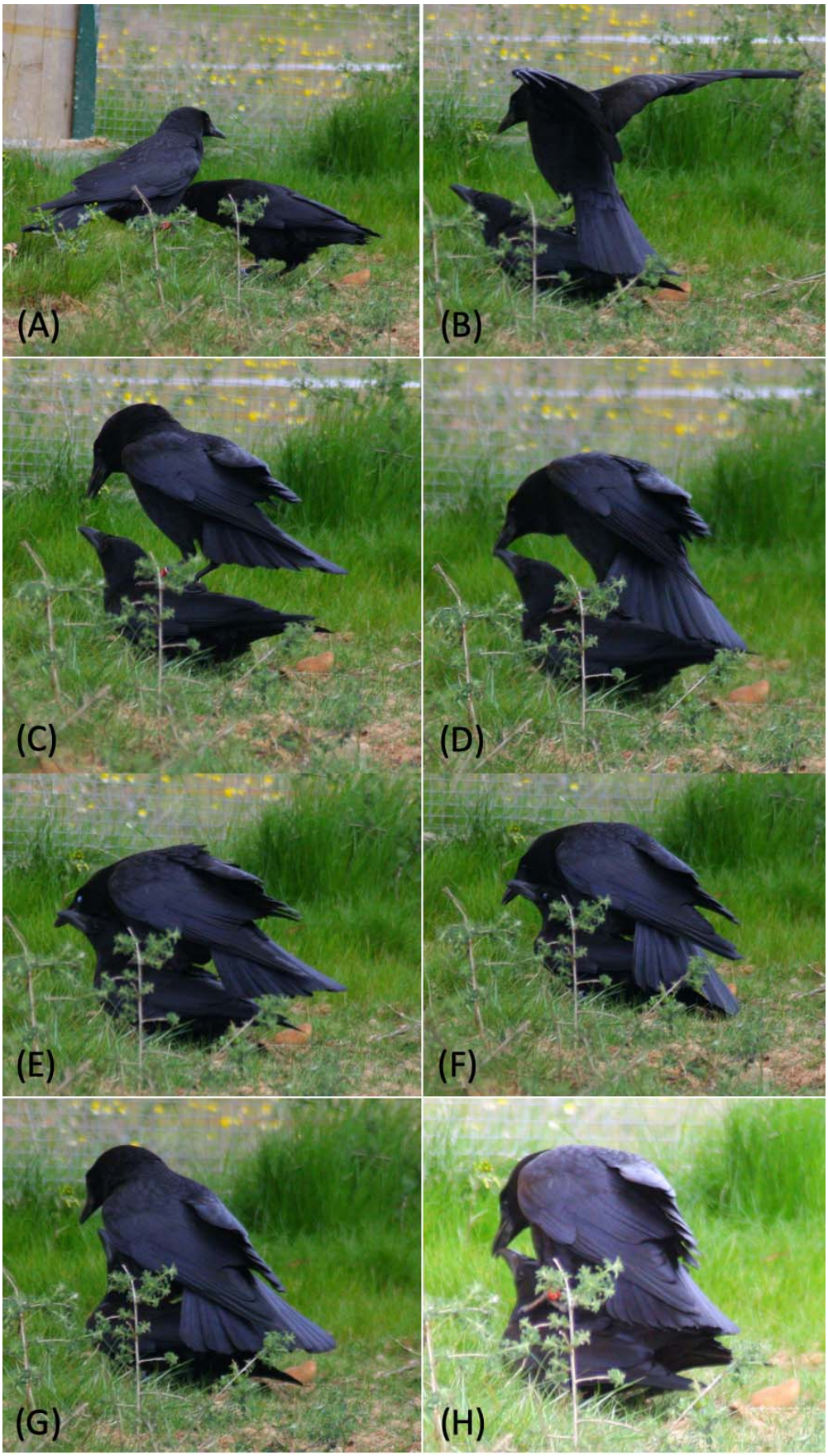
Figure 1: Portrait of focal individuals illustrating size dimorphism in bill length and width. The female bird is shown on the left (red colour ring), the male is slightly crouched on the right (blue colour ring).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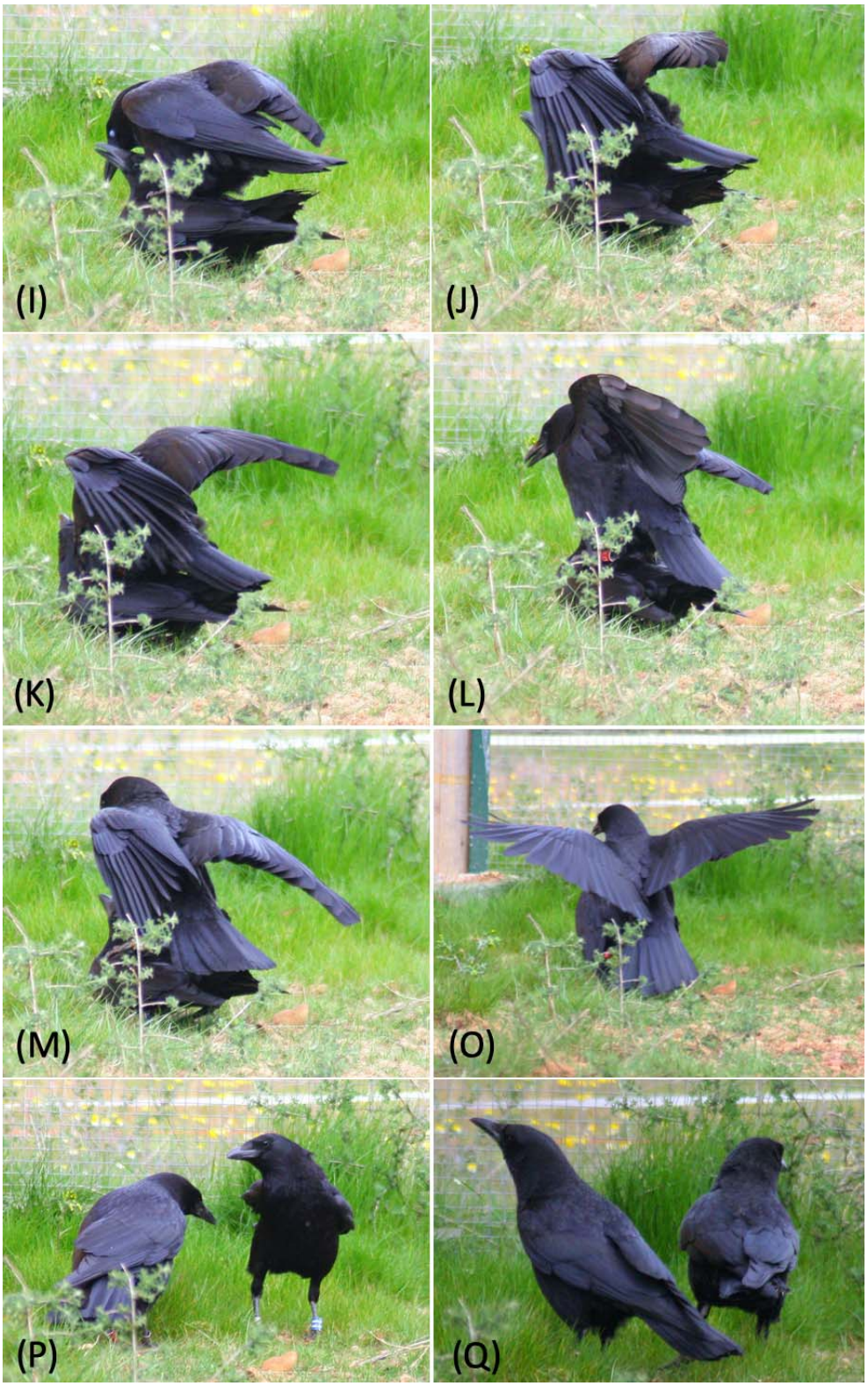

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Figure 2: Series of 16 photographs taken by CAFW documenting an observation of a reversed, non-conceptive mounting on 26th April 2013. A female carrion crow (red colour ring) is mounting a pair-bonded, male carrion crow (blue colour ring).