



AN OBSERVATION OF RECIPROCAL MOUNTING BY THE SPOT-WINGED PIGEON *PATAGIOENAS MACULOSA*

Carlos Bosque¹

¹ Universidad Simón Bolívar. Dept. Biología de Organismos. Caracas, Venezuela

E-mail: Carlos Bosque · carlosb@usb.ve

Abstract · Reciprocal mounting, involving heterosexual or same-sex individuals, is a widespread but under-reported behaviour in birds. It is generally accepted that it is an integral part of heterosexual courtship in some bird species, and that it may provide a mechanism to reinforce non-aggressive relationships through homosexual interactions. Here, I report an observation of reciprocal mounting by two Spot-winged Pigeons *Patagioenas maculosa*, in the city of Córdoba, Argentina. Since Spot-winged Pigeons are monomorphic, it was not possible to conclude whether mounting occurred between heterosexual or homosexual individuals of the pair. Considering that elements of the copulatory sequence of the pair are frequent in the repertoire of courtship and mating displays of columbids, it is argued that female-male mounting occurred rather than same-sex mounting. Uncertainty regarding the assignment of sexes emphasizes the need for attention to possible homosexual interactions in birds, which is an important issue considering the current views of homosexuality in animals.

Resumen · Una observación de monta recíproca en la paloma manchada *Patagioenas maculosa*

La monta recíproca, que involucra a individuos heterosexuales o del mismo sexo, es un comportamiento generalizado, pero poco reportado en las aves. Generalmente, se acepta que la monta recíproca es una parte integral del cortejo heterosexual de algunas especies de aves y que también puede proporcionar un mecanismo para reforzar las relaciones no agresivas a través de interacciones homosexuales. Aquí reporto una observación de monta recíproca de dos palomas manchadas *Patagioenas maculosa* en la ciudad de Córdoba, Argentina. Dado que esta especie es monomórfica, no fue posible concluir si la monta se produjo entre individuos heterosexuales u homosexuales. Teniendo en cuenta que los elementos de la secuencia copulatoria de la pareja son frecuentes en el repertorio de cortejo y en los despliegues de apareamiento de los columbidos, se argumenta que se produjo una monta recíproca entre hembra y macho, en lugar de entre aves del mismo sexo. La incertidumbre sobre la asignación e identificación de sexos enfatiza la necesidad de prestar atención en el futuro a la posible relevancia de las interacciones homosexuales en las aves.

Keywords: *Columbidae* · *Copulatory behaviour* · *Courtship* · *Pseudo Copulation* · *Reverse Mounting*

Reciprocal mounting, involving female-male heterosexual pairs as well as individuals of the same sex, including male-male and female-female interactions, is a widespread, but likely under-reported behaviour in birds and other animals (James 1983, Nuechterlein & Storer 1989, Gómez et al. 2023). Female-male mounting has been documented in at least 230 species of 37 families belonging to 10 orders (James 1983, Nuechterlein & Storer 1989). Although their functions are not fully understood, it is generally accepted that female-male mounting is an integral part of heterosexual courtship during pair bonding and mating in some species (James 1983, Bowman & Curley 1986, Bertran & Margalida 2006). This behaviour seems more common among monochromatic and monogamous bird species and is particularly frequent among grebes (Podicipedidae; Nuechterlein & Storer 1989). Female-male mounting also occurs in social contexts outside the pair bond (Hagemeyer 2016), perhaps associated with social bonding and reduction of aggression in group living birds (MacRoberts & MacRoberts 1976, Walker-Roseman et al. 2020), or the establishment of dominance in small groups (Dawson & Mannan 1991).

Homosexual mounting and sexual interactions, although apparently at odds with traditional evolutionary theory, have been documented in over 130 species of birds and are widespread in some taxa (MacFarlane et al. 2010, Hagemeyer 2016). While both sexes may participate in homosexual mounting e.g., the Tasmanian Native Hen *Tribonyx mortierii* (Ridpath 1972, Hagemeyer 2016), in others, only one sex engages in same-sex mounting, such as in males of Cattle Egrets *Bubulcus ibis* (Fujioka & Yamagishi 1981). Male-male homosexual behavior, including mounting, is more frequent in highly polygynous species, while female-female sexual behaviour is more frequently expressed in socially monogamous precocial species (MacFarlane et al. 2007, 2010).

In this note, I describe an incident of reciprocal mounting by a pair of Spot-winged Pigeons *Patagioenas maculosa*, in the Ar-



gentinian Chaco. Reciprocal mounting has rarely been documented in Columbidae (pigeons and doves), and has not been described as part of their normal courtship. Anecdotal reports mention female-male mounting in the behavioral displays of only three species of pigeons, the Rock Dove *Columba livia* (Nuechterlein & Storer 1989), the Band-tailed Pigeon *Patagioenas fasciata* (Williams 1942), and the Red-billed Pigeon *Patagioenas flavirostris* (Skutch 1964). In turn, no homosexual mounting has been documented in captive or wild Columbidae species.

The Spot-winged Pigeon is a handsome monomorphic, or slightly dimorphic pigeon (Gibbs 2001), distributed from central Peru southward through Bolivia to central Argentina and northern Chile. Its range extends eastward across southern Brazil and Paraguay to Uruguay, along arid to semi-arid and open woodland and scrub habitats (del Hoyo et al. 2022). It is a common bird in the surroundings of the city of Córdoba, Argentina, where my observations were made. Breeding occurs throughout the year in Argentina (del Hoyo et al. 2022), but there is surprisingly little published information regarding its reproductive behavior. It is reasonable to assume that like all of the more than 350 species of Columbidae, they are socially monogamous with biparental care, that both sexes incubate the eggs and feed the nestlings, and that they are solitary nesters like all the other 16 species of *Patagioenas* (Winkler et al. 2020, del Hoyo et al. 2022). Males are known to perform display-flights with slow wingbeats (del Hoyo et al. 2022). My observations refer to the nominate subspecies *P. m. maculosa*, which is widespread and common in the lowlands of the Chaco desert and the surrounding country (del Hoyo et al. 2022).

On November 11, 1995 in the neighborhood “Los Bulevares” within the city limits of Córdoba, Argentina (31° 20' 15" S, 64° 13' 33" W approx.), at nearly 12:00 noon, I observed two Spot-winged Pigeons perched on the branch of a *Prosopis* tree, about four meters above the ground. I observed the pigeons from a distance of approximately 10–12 m using 9x magnification binoculars; I had no photography or recording equipment at the time, so I took notes and made sketches of their activities on site.

The pigeons perched side by side in close contact, “pigeon 1” to the left. Suddenly, pigeon 1 mounted on the back of “pigeon 2”. Pigeon 2 crouched for approximately 15 to 20 s while pigeon 1 flapped its wings to maintain its position. Immediately, upon dismounting, pigeon 1 returned to its original position to the left of pigeon 2. Subsequently, pigeon 2 proceeded to preen for approximately 20–30 s after seemingly making contact of its beak with the uropygial gland. While preening, pigeon 2 held a white filoplume in its beak; however, it was not evident to me whether the feather had been plucked or if it had accidentally attached to its beak during the preening itself. While pigeon 2 was preening, pigeon 1 remained perched beside it, without any interaction. After preening, pigeon 2 was immediately mounted on the back of pigeon 1, reversing the position of the previous mounting, and while swinging its tail up and down held its position for approximately 20 s. Subsequently, pigeon 2 dismounted and moved to its original position to the right of pigeon 1, on the same branch. Immedi-

ately thereafter, pigeon 2 stretched up its neck and turned its gaze away from pigeon 1, while the latter repeatedly nibbled the back of the neck of pigeon 2 for approximately 15 s (as in caressing, Goodwind 1964). Immediately, a short period of “billing” (Peeters 1962) followed; they gripped each other’s bill and swayed from side to side alternating their positions for approximately 10 s. Afterwards, pigeon 1 made a display flight gliding with wings in a “V” in a circle of about 50 m in diameter and landed in a nearby tree. Pigeon 2 remained on the same branch until I finished my observation.

Display components and movements such as preening, nibbling/allopreening, billing, and caressing or display flights, are frequent in the repertoire of mating displays in pigeons (e.g., Peeters 1962, Goodwin 1983), supporting that the observed activities corresponded to a heterosexual copulatory sequence. Pigeon 1 was judged to be a male, mainly because males in pigeons perform display flights (Goodwin 1956, 1983), and because males of Spot-winged Pigeons execute display-flights with slow wing beats (del Hoyo et al. 2022). Furthermore, during the first mounting, I appraised that there was cloacal contact, particularly because of the lateral position of the tail of pigeon 2 while crouching. It is important to recognize the uncertainty concerning the assignment of sex, since Spot-winged Pigeons are superficially monomorphic.

The argument that female-male mounting occurred is also contingent on the assumption that I was observing a heterosexual pair. Although it is possible that my observations involved male-male-or female-female mounting, I believe it was more likely to be a heterosexual pair. Homosexual behavior, including pair bonding, courtship, and mounting, has been reliably reported under non-captive conditions for at least 93 species of birds, none of which belong to Columbidae (MacFarlane et al. 2010). Nonetheless, it would be very difficult to confirm same-sex pairing in Columbidae species since most species have similar or nearly similar sexes. The expression of homosexual behavior in birds is related to disparities in the allocation of parental care between the sexes and their growth mode (MacFarlane et al. 2007, 2010). Homosexual behavior(s) are expected to increase in frequency for the sex that invests less in parental care and potentially enjoys increased mating opportunities. In agreement with expectations, broadly, male-male sexual behaviour occurs across all mating systems, with its frequency increasing in polygynous species with little or no male parental care contribution (MacFarlane et al. 2007, 2010). Consequently, in socially monogamous species, the expression of male homosexual behavior is lower. In turn, female-female sexual behaviour is more frequently expressed in socially monogamous species that produce precocial young rather than in those with an altricial mode of development (MacFarlane et al. 2007, 2010). In summary, given that Spot-winged Pigeons are altricial, probably sexually monogamous, have bi-parental care, and frequently display components in the copulatory sequence of pigeons, my observation of reciprocal mounting can most likely be attributed to a heterosexual pair.

Female-male mounting in the Rock Pigeon *Columba livia* was originally mentioned in Edmund Selous’s (1901, p: 181) account of the breeding behaviour of the Great Crested Grebe

Podiceps cristatus: “Now, with regard to the curious apparent change of sex in these two Grebes, I here recall what I have observed in the case of a pair of dovecot Pigeons, viz. that, immediately after the ordinary pairing of the birds, the male would crouch to the female, who then performed, apparently, the office of the male: so that anyone seeing the two, and unacquainted with such possibilities, would have sworn absolutely that the female bird was the male, and vice versa. Should this appear incredible to some, I can only say that I saw it taking place right in front of me, not once merely, but several times, and at no more than a step or two’s distance- in fact, under such circumstances as eliminated the possibility of mal-observation.” A second brief account pertaining to Rock Doves was given in Whitman’s (1919, p: 97) posthumous description on the behavior of the pigeon: “When either bird thus plays the part of the opposite sex it does so rather unwillingly and under protest, as it were, and the resultant acts often lack something of their normal vigor, finish, and completeness.”

Passing mention of female-male mounting in the Band-tailed Pigeon *Patagioenas fasciata* was made by Williams (1942) in his description of the sexual behavior of the Brandt’s Cormorant *Phalacrocorax penicillatus*: “I have witnessed it [female-male mounting] also in Band-tailed Pigeons *Columba fasciata* in the wild state (unpublished observation).” A more descriptive account of female-male mounting by the Red-billed Pigeon *Patagioenas flavirostris* was witnessed by Alexander Skutch (1964) in Costa Rica: “At 848 one member of the pair went to the nest with nothing in its bill, then promptly left, perched on the end of a dead branch, and called with deep, resonant notes, which soon drew its mate. The first pigeon then flew up beside the newcomer and crouched and, after a while, the latter acceded to this invitation and mounted it. Presently they reversed roles, the one who had been below mounting the one who had been on top. Thus, to my regret, I could not distinguish the sexes by their positions in coition.” In turn, no mention of female-male mounting was cited by Barlow’s (1967) account on displays of the Spot-winged Pigeon or in Goodwin’s (1964) description of displays of the closely related Picazuro Pigeon *Patageoena picazuro*.

My observations involved a single and brief instance of copulation of Spot-winged Pigeons, leaving room for a more complete study of its copulatory behavior in the future. The uncertainty in the assignment and identification of sexes emphasizes the need for future attention to the possible relevance of same-sex interactions among monochromatic bird species, an important issue considering the current views of homosexual interactions among birds and other animals (e.g., MacFarlane et al. 2007, 2010, Gómez et al. 2023). Nonetheless, regardless of possible inadequacies, it is most probable that female-male mounting occurred in Spot-winged Pigeons and that these observations further document the occurrence of this poorly studied behavior in pigeons.

ACKNOWLEDGEMENTS

I express my gratitude to members of the Instituto de Zoología Aplicada (Universidad Nacional de Córdoba) M. Nores, M. Martella, J. Navarro and E.H. Bucher for their support and hospitality during my stay in Córdoba. Reviewers M. Edworthy, F.

Hayes and Associate Editor K.L. Cockle made the best kind of revision.

REFERENCES

- Barlow, JC (1967) Notes on some displays of the Spotted Pigeon *Columba maculosa*. *Ibis* 110: 102–104. <https://doi.org/10.1111/j.1474-919X.1968.tb07984.x>
- Bertran, J & A Margalida (2006) Reverse Mounting and Copulation Behavior in Polyandrous Bearded Vulture (*Gypaetus barbatus*) trios. *Wilson Journal Ornithology* 118: 254–256. <https://doi.org/10.1676/05-046.1>
- Bowman, R & EM Curley (1986) Reverse mounting in the American Kestrel. *Wilson Bulletin* 98: 412–473.
- Dawson, JW & RW Mannan (1991) Dominance hierarchies and helper contributions in Harris’ hawks. *Auk* 108: 649–660. <https://doi.org/10.2307/4088105>
- Del Hoyo, J, LF Baptista, N Collar, PW Trail, GW Kirwan, HM Horblit, PF Boesman & EFJ Garcia (2022) Spot-winged Pigeon (*Patagioenas maculosa*) in Keeney, BK (ed). *Birds of the World*. Version 1.1. Cornell Lab of Ornithology, Ithaca, NY, USA. <https://doi.org/10.2173/bow.spwpig3.01.1>
- Fujioka, M & S Yamagishi (1981) Extramarital and pair copulations in the Cattle Egret. *Auk* 98: 134–144. <https://doi.org/10.1093/auk/98.1.134>
- Gibbs, D (2001) *Pigeons and Doves: A Guide to Pigeons and Doves of the World*. Yale University Press. New Haven, Connecticut.
- Gómez, JM, A González-Megias & M Verdú (2023) The evolution of same-sex behaviour in mammals. *Nature Communications* 14: 5719. <https://doi.org/10.1038/s41467-023-41290-x>
- Goodwin, D (1956) The Significance of Some Behaviour Patterns of Pigeons, *Bird Study* 3: 25–37.
- Goodwin, D (1964) Some calls and displays of the Picazuro Pigeon. *Condor* 66: 418–422. <https://doi.org/10.2307/1365431>
- Goodwin, D (1983) *Pigeons and doves of the world*. Cornell Univ. Press. Ithaca, NY.
- Hagemeyer, N (2016) Sex-obsessed or just sociable? Non-copulatory displays in the hamerkop. *Frontiers Ecology Environment* 14: 397–398. <https://doi.org/10.1002/fee.1318>
- James, PC (1983) Reverse Mounting in the Northwestern Crow. *Journal Field Ornithology* 54: 418–419.
- MacFarlane, GR, SP Blomberg, G Kaplan, G. & LJ Rogers (2007) Same-sex sexual behavior in birds: expression is related to social mating system and state of development at hatching. *Behavioral Ecology* 18: 21–33. <https://doi.org/10.1093/beheco/arl065>
- MacFarlane, GR, SP Blomberg & PL Vasey (2010) Homosexual behaviour in birds: frequency of expression is related to parental care disparity between the sexes. *Animal Behaviour* 80: 375–390. <https://doi.org/10.1016/j.anbehav.2010.05.009>
- MacRoberts, MH & BR MacRoberts (1976) Social organization and behavior of the Acorn Woodpecker in central coastal California. *Ornithological Monographs* No. 21. American Ornithologists’ Union, Washington, DC.
- Nuechterlein, G & RW Storer (1989) Reverse mounting in grebes. *Condor* 91: 341–346. <https://doi.org/10.2307/1368312>
- Peeters, HJ (1962) Nuptial behavior of the Band-tailed Pigeon in the San Francisco Bay Area. *Condor* 64: 445–470. <https://doi.org/10.2307/1365469>
- Selous, E (1901) An observational diary of the habits —mostly domestic— of the Great Crested Grebe (*Podiceps cristatus*). *The Zoologist* 4th ser. 719: 161–183.
- Skutch, AF (1964) Life histories of Central American pigeons. *Wilson*

Bulletin 76: 211–247.

Walker-Roseman, LD, KA GGiusti & FE Hayes (2020) Post-Breeding Extra-Pair Pseudocopulation in the Pygmy Nuthatch. *Western Birds* 51: 164–166. <https://doi.org/10.21199/WB51.2.9>

Whitman, CO (1919) The behavior of pigeons. Posthumous works of Charles Otis Whitman. In Carr, H. A. *Carnegie Inst. Washington*, publ. 257, 3: 1–161. Carmel, California.

Williams, L (1942) Display and sexual behavior of the Brandt Cormorant. *Condor* 44: 85–104. <https://doi.org/10.2307/1364255>

Winkler, DW, SM Billerman & IJ Lovette (2020) Pigeons and Doves (*Columbidae*) in Billerman, SM, BK Keeney, PG Rodewald & TS Schulenberg (eds). *Birds of the World*. Version 1.0. Cornell Lab of Ornithology, Ithaca, NY, USA. <https://doi.org/10.2173/bow.columb2.01>