

## Reverse Mounting and Copulation Behavior in Polyandrous Bearded Vulture (*Gypaetus barbatus*) Trios

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Reverse mounting, in which the female mounts the male, has been described in a number of bird species (see James 1983, Nuechterlein and Storer 1989). This behavior has been rarely documented in raptors, however, except for a few isolated cases in species such as American Kestrel (*Falco sparverius*; Bowman and Curley 1986) and Egyptian Vulture (*Neophron percnopterus*; Donazar 1993).

We describe a case of reverse mounting in a polyandrous trio of Bearded Vultures (*Gypaetus barbatus*). Bearded Vultures are territorial and socially monogamous (Hiraldo et al. 1979); however, in the Pyrenees (in both Spain and France), where the species' largest European population occurs, polyandrous coalitions are relatively common (Heredia and Donazar 1990). The birds in this population maintained 104 breeding territories (R. Heredia and M. Razin pers. comm.), 18 of which were occupied by polyandrous trios. Before egg-laying, Bearded Vultures in the Pyrenees engage in their copulations for an average of 67 days (range 5–90; Bertran and Margalida 1999), during which male-male mountings in trios occasionally occur (Bertran and Margalida 2003).

Between 2004 and 2005, we monitored a polyandrous trio of Bearded Vultures in the central Pre-Pyrenees mountains in Catalonia, northeastern Spain, during their courtship period (200 hr of observation). We sexed and identified the individuals by observing their copulatory activities and specific plumage patterns. On 30 October 2004 at 12:19 UTC+1 (84 days before egg-laying), the female mounted the alpha male after she had been mounted unsuccessfully by the beta male. Following the female's mount, the alpha male drove the beta male off the perching site. The duration of the reverse mounting (8 sec) was similar to that of behaviorally successful male-female copulations recorded in other polyandrous groups (mean 5.10.49 sec  $\pm$  6.1.30 SD, range 5–14,  $n = 5$ ; Bertran and Margalida 2004).

Previously, researchers have studied reverse mounting in the context of pair formation, degree of sexual motivation, or reversal of sexual dominance (Nuechterlein and Storer 1989, Bowen et al. 1991, Ortega-Ruano and Graves 1991). Due to their physical and behavioral characteristics, it has been suggested that female Bearded Vultures can dominate males (see Negro et al. 1999); in the Cattle Egret (*Bubulcus ibis*), reverse mounting has been associated with establishing dominance (Fujioka and Yamagishi 1981). However, if reverse mounting were of adaptive value (e.g., to maintain female dominance or to strengthen heterosexual couplings), it likely would be more common. On the other hand, sexual interactions outside the context of fertilization appear to be relatively common in polyandrous trios (Table 1), and reverse mounting might simply be a side effect of male-male mountings. That is, the function of reverse mounting may be to regulate socio-sexual tensions—similar to the function of male-male mountings (Bertran and Margalida 2003, see also Heg and van Treuren 1990, Cockburn 2004). Further research is needed to determine whether reverse mounting is the result of confrontational situations or helps to regulate them.

TABLE 1.

Number of male-female, male-male, and reverse mounting copulation attempts observed in monogamous pairs ( $n = 8$ ) and polyandrous trios ( $n = 5$ ) of Bearded Vultures in the Pyrenees, northeastern Spain, 2004–2005.

	Male-Female	Male-Male	Female-Male	Source
Pairs	189	—	0	Bertran and Margalida (1999)
Trios	356	39	1	This study

