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Author(s): Matthew R. Halley and Christopher M. Heckscher

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Multiple Male Feeders at Nests of the Veery

Matthew R. Halley^{1,2} and Christopher M. Heckscher¹

ABSTRACT.—We present the first documentation of nestling care by multiple male feeders at nests of the Veery (*Catharus fuscescens*) in a Mid-Atlantic Piedmont forest in northern Delaware. This is only the second confirmation of this behavior in a Nearctic-neotropical migrant songbird. Five of six nests (83%) were attended by a male that concurrently fed nestlings at a second or third nest. Three of six nests (50%) were attended by one female and two males. No females were observed at more than one nest. We monitored >140 Veery nests at our study site since 1998, and believe the dense breeding habitat and single-brooded nature of the

Veery have inhibited our ability to confirm this behavior prior to 2011. Our data suggest this behavior is widespread in our study population. *Received 25 July 2011. Accepted 30 November 2011.*

Avian mating systems that feature multiple male feeders attending a single-female brood are rare but taxonomically widespread, and documented for only 14 species representing nine families (Brown 1987, Hartley and Davies 1994, Ligon 1999, Goetz et al. 2003). This type of behavior is especially rare among long-distance migrant songbirds. Only Smith's Longspur (*Calcarius pictus*) (Briskie et al. 1998) and Bicknell's Thrush (*Catharus bicknelli*) (Goetz et al. 2003) in North America feature provisioning by

¹ Department of Agriculture and Natural Resources, Delaware State University, Dover, DE 19901, USA.

² Corresponding author; e-mail: matthewhalley@gmail.com

TABLE 1. Methods of observation for six nests of the Veery, each attended by a single female (A–F), in a Delaware Piedmont forest, 2011.

Female	# of Males	Method	Time (hrs)
A	2	Video	16.9
B	1	Direct	<1.0
C	1	Video	6.3
D	2	Both	10.1
E	2	Direct	<1.0
F	1	Video	18.7

multiple male feeders despite engaging in annual long-distance migration. Modes of parental care among the Turdidae that involve more than two adults per nest are only known from 3% of the species (Cockburn 2006). We present the first documentation of multiple male feeders at nests of the Veery (*C. fuscescens*), a Nearctic-neotropical migratory thrush long considered to be monogamous.

METHODS

Research was conducted at White Clay Creek State Park, New Castle County, Delaware (39° 44' N, 75° 45' W), on the floodplain of a Middle-Atlantic Piedmont forest (Heckscher 2004) during May and June 2011. We monitored six Veery nests (Table 1) from time of discovery until fledging or failure with field observations and use of a compact digital video camera (Oregon Scientific ATC2K, Tualatin, OR, USA). The small video camera was placed <1 m from the nest in each case, covered in camouflage, and concealed in natural vegetation. Adult Veeries were banded with unique color combinations and subsequently identified on film or via binoculars. All six nests were in dense forest understory dominated by the invasive shrub *Rosa multiflora*. Nests were located using behavioral cues, most often during the nestling phase, as adults made regular trips to the nest with food. Only one nest was found and monitored prior to hatching.

RESULTS

We observed 11 adult Veeries provisioning nestlings at six nests (Fig. 1). All females ($n = 6$) fed a single brood while males ($n = 5$) were observed provisioning nestlings at one (2 of 5 males), two (2 of 5), or three (1 of 5) nests. Five of six broods (83%) were attended by a male that was detected provisioning nestlings at a second or third nest. Three of six broods (50%) were attended by

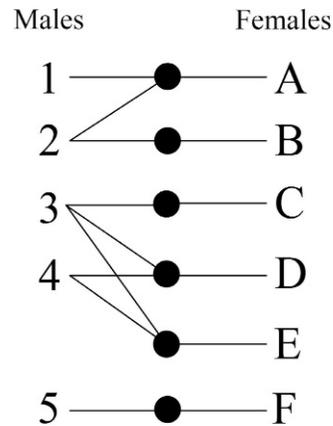


FIG. 1. Males (1–5) and females (A–F) with their respective parental contributions at six Veery nests (black circles) in a Piedmont forest in Delaware. Solid lines represent feeding behavior that was captured on video or observed in the field.

multiple male feeders. We observed only one male and one female feeder at one nest (17%).

We examined 52 hrs of video footage from four of the six nests (Table 1; mean \pm SD = 13.0 \pm 5.8 hrs; range = 6.3–18.7 hrs). Adult feeders for nests lacking footage were identified in the field using binoculars. Only four nests were filmed for >6 hrs and our findings may underestimate the incidence of multiple male feeders at these nests. These males may also have attended additional nests that were not observed.

On the morning of 20 June, MRH observed a Cooper's Hawk (*Accipiter cooperii*) approach within 10 m of a monitored nest with mature nestlings (<24 hrs from fledging). All three adult feeders, previously identified from video footage, were observed vigorously defending the nest site, calling emphatically and making diving flights in the direction of the hawk, which subsequently retreated. A similar defense by multiple males was also observed at a second nest on 27 June (also with nestlings <24 hrs from fledging). Defensive behavior involving three adults was observed at two of the three nests (67%) that were attended by multiple male feeders.

DISCUSSION

Our confirmation of multiple male feeders at Veery nests is the first for this species and only the second report for a Nearctic-neotropical migratory songbird. Provisioning strategies observed in our study are consistent with descriptions of the variable polygynandrous mating system of congeneric Bicknell's Thrush (Goetz

TABLE 2. Distances (m) among six Veery nests in a Piedmont forest in Delaware, 2011. Nests A, D, and E were visited by multiple male feeders. Nests A–E were visited by a male that also attended another nest. Nest F was attended by a socially monogamous pair.

Nest	A	B	C	D	E	F
A	–	169.1	127.1	55.9	80.1	357.4
B	169.1	–	290.2	168.2	216.1	526.5
C	127.1	290.2	–	126.8	147.9	244.3
D	55.9	168.2	126.8	–	134.8	370.4
E	80.1	216.1	147.9	134.8	–	332.9
F	357.4	526.5	244.3	370.4	332.9	–

et al. 2003) including: (1) males attending multiple nests, (2) multiple male feeders at single-female nests, and (3) a monogamous pair.

We monitored >140 Veery nests at our study site since 1998, but provisioning by multiple males was not confirmed until 2011. Several observations suggested that Veeries at our site may have engaged in this behavior in previous years, but confirmation did not occur prior to use of video cameras. Our ability to confirm the presence of multiple male feeders was likely diminished by dense understory vegetation at nest sites (Heckscher 2004) and the single-brooded nature of this species (Heckscher 2007). These observations suggest multiple males provisioning single broods and provisioning simultaneously at multiple nests is widespread in our population in at least some years. Parental care strategies may exhibit annual fluctuations in frequency and distribution (Brown 1987, Davies 1992). Multiple male provisioning strategies at our study site may be facultative (i.e., influenced by factors that vary from year to year, including breeding synchrony, sex ratios, density of breeders, and availability of suitable habitat). Males that were detected provisioning at multiple nests did not necessarily provision at the nearest available nest (Table 2), but asynchronous nestling periods do not make it possible to rule out nest proximity as a factor influencing helping behavior.

Veeries at our study site have a social dominance hierarchy among males dependent on age or time spent in the population (Heckscher 2007). Territorial aggression among male Veeries is common (Dilger 1956, Heckscher 2007), unlike Bicknell's Thrush (Rimmer et al. 2001, Goetz et al. 2003). However, Heckscher (2007) found dominant males tolerated nests of subordinate males within their territories while maintaining nests of their own and continuing to defend against adjacent territorial males. This resulted in overlapping home ranges among male Veeries, a

feature that has been shown to facilitate polyandrous mating behavior in other species (Davies 1992, Goetz et al. 2003). Aggressive behavior described in the context of intraspecific territorial exclusion (e.g., Dilger 1956) may also have a role in establishment of relationships among males that provision at the same nest (MRH, unpubl. data). Our discovery of multiple male feeders for a single clutch provides a new context for interpreting foundational studies of Veery behavioral ecology including intraspecific hostile interactions (Dilger 1956) and use of the vocal repertoire in communication (Heckscher 2007).

The close phylogenetic relationship between Bicknell's Thrush and the Veery (Ellison 2001, Outlaw et al. 2003, Winker and Pruett 2006), and the general similarities between nestling care in these species, warrant a re-evaluation of hypotheses regarding the evolutionary history of parental care in *Catharus* thrushes. The evolutionary origin of this behavior is unlikely to be explained by ecological constraints experienced by Bicknell's Thrush alone, such as harsh montane weather (Goetz et al. 2003) or food shortage (Strong et al. 2004), as Veeries breed at lower elevations in broadleaf forests that lack these extreme conditions. Future studies of the poorly-known Gray-cheeked Thrush (*C. minimus*) and the Ruddy-capped Nightingale Thrush (*C. frantzii*) may help define whether parental care among these closely-related species is (1) recently evolved, (2) plesiomorphic within the *bicknelli* clade (Outlaw et al. 2003), or (3) derived from a more distant *Catharus* ancestor. Future studies of Veery breeding ecology may clarify or reveal the role of hierarchies, genetic relatedness among multiple male feeders, and extra-pair paternity within the mating system of this secretive forest thrush.

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