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NOTES

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ANTING BEHAVIOR OF BOAT-TAILED GRACKLES

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Anting behavior occurs when a bird grasps in its beak an object containing volatile or odoriferous compounds, and applies it to its plumage with stereotyped movements resembling preening. Birds most often use ants, but also may employ centipedes or moth balls. Several species of grackles (*Quiscalus*) have been reported anting. This includes many records for the Common Grackle (*Q. quiscula*; Whitaker 1957, Potter 1970, Potter and Hauser 1974) and one for the Greater Antillean Grackle (*Q. niger*, Gosse 1847). Whitaker (1957, Table 3) cites "W. W. Worthington, MS" as the source for a report of anting by Boat-tailed Grackles (*Q. major*). Possibly, the Boat-tailed Grackles used lemons or limes to ant, as Whitaker (1957:244) paraphrased a letter from Worthington dated 24 November 1956, in which such anting episodes are mentioned.

I saw anting by Boat-tailed Grackles on 13 days in June and July between 1987 and 1990 on Sullivan's Island, South Carolina (Table 1). The grackles anted in a field adjacent to a residential area. The field was sparsely covered with grasses and forbs interspersed with patches of bare ground. Vegetation was less than 30 cm high. The earliest anting date was 11 June (1989), and the latest, 22 July (1989). I watched the field throughout the year and saw no other anting episodes. I saw no anting in 1991, possibly because the field had been colonized by fire ants (*Solenopsis* sp.), which affect the abundance of other ant species (Porter and Savignano 1990).

I saw anting most often in early morning, but it occurred throughout the daylight hours (Table 1). Except for the first incident, the anting involved groups of grackles, which ranged in size from 2 to 16 individuals (mean \pm SD = 8.8 ± 3.7 , $n = 12$). Most anting grackles were within 1 m of each other. Temperatures ranged from 22.0 °C to 29.5 °C. On five days on which I noted the wind, it was calm or less than 10 km/h.

The grackles engaged in both passive and active anting. During passive anting, the individual remains immobile and allows ants to invade its plumage. In active anting, birds capture ants and apply them to their plumage (Rothschild and Clay 1952). During both passive and active anting incidents, the grackles ruffled their feathers and spread their wings and tails. The ventral plumage was in contact with the ground, and the wings and tail were spread and also touched the ground. Actively anting birds usually oriented to clumps of grass, where they repeatedly mandibulated grass blades, or jabbed and shook the clumps. They also appeared to catch ants by gaping in the grass clumps. I did not see any ants taken from the ground. The grackles applied the ants to their outer remiges, and also preened the uropygial and cloacal regions. Anting birds often held their bodies asymmetrically, and occasionally lost balance, a "tumbling" behavior (Whitaker 1957) that has been seen in other anting blackbirds, including Orchard Orioles (*Icterus spurius*; Whitaker 1957) and Yellow-shouldered Blackbirds (*Agelaius xanthomus*; Post and Browne 1982). Aggressive interactions were common among the anting birds. One juvenile male repeatedly supplanted anting females from grass clumps, where it began actively anting in the same position.

Adult and juvenile males, adult females, and, possibly, juvenile females, engaged in anting (Table 1). The earliest that I saw a juvenile male perform anting was 14 June (1989).

Table 1. Anting by Boat-tailed Grackles, Sullivan's Island, South Carolina, 1987-1990.

Date (time)	Duration (min)	Total no. in flock*	Maximum no. active simultaneously
15 July 87 (0720)	≥ 10	1 (JM)	1
6 July 88 (0700)	60	25 (11 JM, 5 AM, 9 F)	8
7 July 88 (0755)	-	2	2
11 June 89 (1930)	-	7 (2 AM, 5 F)	7
14 June 89 (0655)	65	54 (6 AM, 12 JM, 36 F)	9
16 June 89 (1800)	≥ 10	6 (6 F)	6
17 June 89 (1845)	≥ 10	12 (2 AM, 10 F)	12
18 June 89 (1330)	≥ 10	15 (2 M 13 F)	12
27 June 89 (0630)	20	18 (6 AM, 12 F)	11
5 July 89 (0800)	≥ 10	10 (5 AM, 5 F)	10
21 July 89 (0805)	51	6 (3 AM, 3 AM)	6
22 July 89 (0940)	5	17 (2 AM, 1 JM, 14 F)	16
25 June 90 (0700)	≥ 10	7 (4 AM, 1 JM, 2 F)	7

*AM = adult male, JM = juvenile male, F = female.

As the earliest Boat-tailed Grackle fledging date in the Charleston area is 15 April (unpubl. data 1986-1992), this individual could not have been more than two months old. There appears to be no published information on the age at which wild birds begin anting, although Nice (1943) saw a captive Song Sparrow (*Melospiza melodia*) anting as early as 36 days old, and Whitaker (1957) had a captive Orchard Oriole that began anting when it was 3 months old.

On 14 June 1989 I collected 10 ants from the center of an area where the grackles had just been anting. The ants were identified as *Conomyrma bureni* (subfamily Dolichoderinae). This species emits at least two odoriferous defensive secretions: 2-heptanone and 6-methyl-5-hepten-2-one (Murray Blum, pers. comm.).

Many hypotheses have been proposed for the function of anting behavior. These include parasite removal (Ali 1936), food preparation (Chisholm 1944, Judson and Bennett 1992), auto-erotocism (Whitaker 1957), feather maintenance (Simmons 1966), skin maintenance during molt (Potter 1970) and reduction of fungal infections (Ehrlich et al. 1986).

Although anting has now been documented for many Temperate Zone species, it is rarely reported, and most published accounts have been based on brief anting episodes by one or a few individuals (see reviews in Whitaker 1957, Potter 1970, Potter and Hauser 1974). Besides providing the first description of anting behavior in Boat-tailed Grackles, this study is significant in showing that large numbers of birds may ant on a regular basis and for extended periods in the summer.

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HISTORY OF AN INTRODUCTION OF ELK IN FLORIDA

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Three introductions of exotic deer (Cervidae) into Florida resulting in persistent wild populations have been reported in the literature. These include sambar deer (*Cervus unicolor*) deliberately released in 1908 on St. Vincent Island off the coast of Franklin County (Newman 1948), axis deer (*Cervus axis*) accidentally introduced through the escape of a few animals in Volusia County during the early 1930s (Allen and Neill 1954), and elk (*Cervus elaphus*) introduced in Highlands County in south-central peninsular Florida in the late 1960s (Layne in Bryant and Maser 1982). This note provides further details of the history of the elk introduction in Highlands County.

In 1967 or 1968, six elk (sex ratio unknown) were released on the Buck Island Ranch (presently the MacArthur Agroecology Research Center of the Archbold Biological Station). The ranch is located in southern Highlands County about 22 km SE of the town of Lake Placid in sections 2, 9-11, 13-16, 21-28, 33-36, R31E, T38S. The Harney Pond Canal (C-41) forms part of the north and west boundaries of the ranch and bisects the property from east to west. Major habitats on the 4086-ha ranch include improved pastures (48%), citrus grove (2%), marshes and sloughs (35%), and forests (15%). The latter category includes cabbage palm (*Sabal palmetto*) hammocks, mixed cabbage palm/live oak (*Quercus virginiana*) hammocks, and live oak hammocks.