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# BEHAVIOR AND INTERACTION OF BEWICK'S AND HOUSE WRENS AT A COMMON DUSTING SITE, WITH COMMENTS ON THE UTILITY OF DUSTING

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Abstract.—Dusting by Bewick's Wrens (*Thryomanes bewickii*) and House Wrens (*Troglodytes aedon*) was observed in 1990 at a common dusting site in eastern Washington. Dusting behavior by both species was similar: (1) dusting occurred most frequently shortly before dusk, (2) individuals usually dusted alone but sometimes in conspecific pairs, (3) postures used were alike and duration of bouts and visits to the dusting site were brief, (4) preening occurred during visits to the dusting site, (5) sometimes small pebbles or pieces of compacted mud were consumed while dusting. Bewick's Wrens displaced House Wrens from the dusting site, the reverse interaction was never observed. In addition to controlling the accumulation of lipids on the plumage, dusting could help control infestations of ectoparasites through cuticular abrasion of the parasite exoskeleton, which leads to rapid desiccation in insects.

**CONDUCTA E INTERACCIONES ENTRE INDIVIDUOS DE *THRYOMANES BEWICKII* Y *TROGLODYTES AEDON* EN UN LUGAR COMÚN EN DONDE TOMARON BAÑOS DE TIERRA: COMENTARIOS SOBRE LA UTILIDAD DE LOS BAÑOS DE TIERRA**

Sinopsis.—Durante el 1990 en la parte este del estudo de Washington, y en un lugar en común, se observaron a individuos de *Thryomanes bewickii* y *Troglodytes aedon* tomando baños de tierra. La conducta de baño en ambas especies resultó similar en lo siguiente: (1) los baños ocurrieron con mayor frecuencia antes del anochecer, (2) las aves se bañaron individualmente y en ocasiones en pares conespecíficos, (3) las posturas utilizadas fueron similares y la duración de los baños y las visitas al lugar fueron breves, (4) ocurrió acicalamiento durante las visitas a los lugares de baño, (5) en ocasiones las aves ingirieron pedazos de barro compacto mientras se bañaban en la tierra. Los reyezuelos de Bewick desplazaron a la otra especie en ocasiones y no se observó lo contrario. Además de controlar la acumulación de lípidos en el plumaje, el baño en tierra podría controlar las infecciones de ectoparásitos sirviendo el polvo como abrasivo al exoesqueleto produciendo como consecuencia la desecación del insecto.

Dusting is a plumage-maintenance behavior especially prevalent in galliform birds, but also widespread in a few groups of passerines, such as larks (Alaudidae), certain sparrow genera (e.g., *Passer*), and wrens (Troglodytidae) (Simmons 1985). The context in which dusting by wrens occurs is poorly described, and the behavior remains a bit of an enigma, although there is good evidence for other species that dusting helps control lipid accumulation on the plumage (Borchelt and Duncan 1974, Healy and Thomas 1973), thereby increasing insulation capability.

Here we describe dusting behavior by Bewick's Wrens (*Thryomanes bewickii*) and House Wrens (*Troglodytes aedon*) in an area of sympatry at the Nature Conservancy's Rose Creek Preserve (46°40′N, 117°20′W) in Whitman County, eastern Washington. Specifically, we (1) describe the temporal context in which dusting occurred, (2) describe interactions between individuals of the two wren species at a common dusting site, and (3) suggest why dusting frequency may vary during the day. We also pres-

ent a hypothesis on how dusting behavior could depress infestations of arthropod ectoparasites.

## OBSERVATIONS

One pair of Bewick's Wrens and at least four House Wrens visited the dusting site. We observed dusting by both species at this site on every day we watched ($n$ = 10) between 15 Jul. and 11 Aug. 1990. Dusting was observed only between 1922 and 2030 PDT, even though we passed the dusting site daily at other times. We did not attempt to observe the site systematically throughout the day, however. Weather during this period was dry and hot (daily temperature maxima were 32–36 C). The dusting site was a 50 × 50 cm patch of dried fine-grained mud (loess and volcanic ash), about 3–5 cm tall. The site was apparently formed from a clod of mud common to the area that had fallen from the underside of an automobile onto one track of a narrow gravel drive adjacent to Rose Creek. We also observed a solitary Bewick's Wren dusting once in the road 31 m from the primary site. Protective cover (mostly *Populus tremuloides, Betula occidentalis* and *Crataegus* sp.) was <2 m away from both dusting sites, and both sites were shaded at the time of our observations.

Dusting posture was similar for both species: body plumage on the back and head was raised, and wings were held partly unfolded and slightly away from the body as the bird shuffled around in a shallow depression in the dried mud, rubbing the sides of the head, belly and tail in the dirt and stirring up dust by vigorously fluttering the wings. Infrequently the dusting bird jabbed at the dirt with its beak in an apparent attempt to loosen dirt that was compacted. Small pebbles or pieces of compacted mud (about 2 × 2 mm) were picked up and swallowed by Bewick's Wrens ($n$ = 4) and House Wrens ($n$ = 2) while dusting. Dusting birds sometimes preened and scratched their heads (during about 60% of the bouts). Mean duration (±SD) of dusting bouts for Bewick's Wrens was 25 ± 16 s ($n$ = 35, range = 5–60 s), and mean time at the dusting site was 112 ± 106 s ($n$ = 17, range = 5–420 s). Dusting bouts by House Wrens were not timed, but lasted <60 s; mean time at the dusting site was 98 ± 76 s ($n$ = 11, range = 40–240 s).

Both species appeared at the dusting site at about the same time, but usually a Bewick's Wren arrived first. House Wrens appeared to be attracted to the site when they detected a dusting Bewick's Wren. When a House Wren approached a dusting Bewick's Wren to <30 cm, the latter individual attacked and displaced the intruding House Wren ($n$ = 24) or chased it in the air ($n$ = 5); chases were brief (<10 s) and short (3–5 m). Bewick's Wrens returned to the dusting site following displacements or chases. House Wrens typically began dusting <30 s after a dusting Bewick's Wren departed, and were never seen to attack or displace a Bewick's Wren. Sometimes two conspecific wrens dusted at the same time (Bewick's Wrens on two of 33 bouts, House Wrens on four of 13 bouts; $G$ = 4.486, df = 1, $P < 0.05$) for up to 120 s, but dusting was usually performed alone. Bewick's Wrens sometimes terminated dusting in response to vo-

calizations ($n$ = 2) or displacement ($n$ = 2) from a non-dusting conspecific. Agonistic behavior between House Wrens at the dusting site was not observed.

## DISCUSSION

Dusting by Bewick's and House Wrens was alike in several respects: (1) dusting appeared to occur most frequently near dusk, (2) dusting was usually performed alone but sometimes in conspecific pairs, (3) postures were alike and duration of bouts and visits to dusting sites were brief, (4) preening occurred during dusting, and (5) sometimes small pebbles or pieces of compacted mud were consumed while dusting, perhaps for nutrients or to aid digestion. Bewick's Wrens did not tolerate the close approach of House Wrens while dusting. Reasons for this intolerance are unknown, but dominance of the former species is the reverse of the pattern observed elsewhere (see Odum and Johnston 1951, Root 1969) and may have contributed to the range expansion of Bewick's Wrens into eastern Washington in the last 20 yr (Weber and Larrison 1977). At least some of the House Wrens using the dusting site were independent juveniles (showing yellow coloration at the gape), however, possibly from one brood. This age difference could explain the dominance of the Bewick's Wrens at the dusting site as well as the greater frequency of dusting by pairs of House Wrens (young House Wrens were often seen traveling in pairs or trios throughout the day).

Dusting in the evening may be routine for some bird species. In Colorado, PH observed a nesting pair of Northern Flickers (*Colaptes cafer*) for 39 h on 17 d, with observations spread throughout the day. The male flicker dusted only in the evening shortly before returning to the nest cavity to incubate and brood for the night. Cactus Wrens (*Campylorhynchus brunneicapillus*) dust most frequently in the evening (Anderson and Anderson 1973), and elsewhere Bewick's Wrens have been noted dusting at that time (Fisk 1983: 139–140, Miller 1941), although Miller (1941) also observed dusting in the morning.

The preponderance of evening dusting by Bewick's and House Wrens may have been an artifact of our uneven sampling, and the brief duration of dusting bouts (see also Anderson and Anderson 1973) could have contributed to our failure to note them at other times. As we passed the site daily (sometimes more than once) and failed to note dusting wrens before evening, however, we believe that the frequency of dusting was greatest late in the day. Dusting shortly before the nocturnal inactive period could be beneficial, in that it would minimize the period when birds are unable to dust (presumably most passerines do not dust at night), and could also increase the insulation capacity of the plumage (Borchelt and Duncan 1974, Healy and Thomas 1973) before ambient temperature drops overnight.

As soil and dust are abrasive to plumage (Burtt 1986), and plumage maintenance is important for health and survival, the benefits of dusting presumably outweigh the detriments. The various hypothesized benefits

are not mutually exclusive. In addition to the thermal advantages of dusting on plumage insulation capacity (Borchelt and Duncan 1974, Healy and Thomas 1973), Potter and Hauser (1974) suggested that dusting could help relieve skin irritation during molt of the ventral body plumage because dusting sites were often sunny and the heated dust might be soothing. Control of ectoparasites is another advantage attributed to dusting (Simmons 1985), although there is little evidence to support this hypothesis and no clear idea how dusting could reduce infestations. Frequent scratching and dusting of the head and neck by wrens during dusting bouts is consistent with this hypothesized attribute of dusting, and suffocation (Stoddard 1941) and dislodgment (Kilham 1975) of ectoparasites have been proposed as possible results of dusting. We propose a third mechanism whereby ectoparasites might be depressed by dusting.

Dusting by birds could help control or reduce populations of arthropod ectoparasites by increasing the probability of cuticular abrasion and death by desiccation. Wigglesworth (1944) and Edwards and Schwartz (1981) have shown that inert dusts and volcanic ash act as natural insecticides. Insects that come into contact with dust and ash desiccate rapidly, largely because these substances abrade the cuticle covering the exoskeleton. Our hypothesis could be tested, first by noting the frequency and rate of mortality of feather lice and mites exposed to fine dusts for durations and frequencies simulating natural dusting events. Second, groups of birds could be experimentally dusted and parasite loads contrasted with comparable control groups. For both tests it would be necessary to examine ectoparasites for evidence of cuticular abrasion and desiccation exceeding that in control groups.

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## LITERATURE CITED

ANDERSON, A. H., AND A. ANDERSON. 1973. The cactus wren. Univ. Arizona Press, Tucson, Arizona. 226 pp.

BORCHELT, P. L., AND L. DUNCAN. 1974. Dustbathing and feather lipid in Bobwhite (*Colinus virgianus*). Condor 76:471–472.

BURTT, E. H., JR. 1986. An analysis of physical, physiological, and optical aspects of avian coloration with emphasis on wood-warblers. Ornithol. Monogr. No. 38.

EDWARDS, J. S., AND L. M. SCHWARTZ. 1981. Mount St. Helens ash: a natural insecticide. Can. J. Zool. 59:714–715.

FISK, E. 1983. The peacocks of Baboquivari. W. W. Norton and Co., New York, New York. 284 pp.

HEALY, W. M., AND J. W. THOMAS. 1973. Effects of dusting on plumage of Japanese Quail. Wilson Bull. 85:442–448.

KILHAM, L. 1975. Dirt-bathing by a Pileated Woodpecker. Bird-Banding 46:251–252.

MILLER, E. V. 1941. Behavior of the Bewick Wren. Condor 43:81–99.

ODUM, E. P., AND D. W. JOHNSTON. 1951. The House Wren breeding in Georgia: an analysis of a range expansion. Auk 68:357–366.

POTTER, E. F., AND D. C. HAUSER. 1974. Relationship of anting and sunbathing to molting in wild birds. Auk 91:537–563.

ROOT, R. B. 1969. Interspecific territoriality between Bewick's and House Wrens. Auk 86: 125–127.

SIMMONS, K. E. L. 1985. Dusting. Pp. 161–162, *in* B. Campbell and E. Lack, eds. A dictionary of birds. Buteo Books, Vermillion, South Dakota.

STODDARD, H. L. 1941. The bobwhite quail: its habits, preservation and increase. Charles Scribner's Sons, New York, New York. 559 pp.

WEBER, J. W., AND E. J. LARRISON. 1977. Birds of southeastern Washington. Univ. Idaho Press, Moscow, Idaho. 66 pp.

WIGGLESWORTH, V. B. 1944. Action of inert dusts on insects. Nature 153:493–494.

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