PELLET-CASTING BY A WESTERN SCRUB-JAY

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Pellet casting in birds of prey, particularly owls, is widely known. It is less well known that a wide array of avian species casts pellets, especially when their diets contain large amounts of arthropod exoskeletons or vertebrate bones. Currently pellet casting has been documented for some 330 species in more than 60 families (Tucker 1944, Glue 1985). Among the passerines reported to cast pellets are eight species of corvids: the Blue Jay (*Cyanocitta cristata*) (Lamore 1958, Tarvin and Woolfenden 1999), Pinyon Jay (*Gymnorhinus cyanocephalus*) (Balda 2002), Gray Jay (*Perisoreus canadensis*) (Strickland and Ouellet 1993), Black-billed Magpie (*Pica hudsonia*) (Trost 1999), Yellow-billed Magpie (*Pica nuttalli*) (Reynolds 1995), American Crow (*Corvus brachyrhynchos*) (Verbeek and Caffrey 2002), Northwestern Crow (*Corvus caurinus*) (Butler 1974), and Common Raven (*Corvus corax*) (Temple 1974, Harlow et al. 1975, Stiehl and Trautwein 1991, Boarman and Heinrich 1999). However, the behavior has not been recorded in the four species of *Aphelocoma* jays (Curry et al. 2002, Woolfenden and Fitzpatrick 1996, Curry and Delaney 2002, Brown 1994). Here we report an observation of regurgitation of a pellet by a Western Scrub-Jay (*Aphelocoma californica*) and describe the specimen and its contents.

The Western Scrub-Jay is omnivorous and forages on a variety of arthropods as well as plant seeds and small vertebrates (Curry et al. 2002). Because of the presence of indigestible components such as chitin, cartilage, and hair in many of these food items, pellet casting by this species is expected. During 25 years of study of Western Scrub-Jays at the Starr Ranch Audubon Sanctuary in Orange County, California, and in northwest Nevada, Elpers had a few sightings of jays regurgitating unknown materials, but pellets were never located in the dense scrub inhabited by these birds. This is not surprising because of the anticipated relatively small size of the pellets, the likelihood that they decompose rapidly in the wild, and the density of vegetation into which they may be expelled. That the jays actually cast a pellet was uncertain.

On the afternoon of 26 June 2006, Elpers observed an adult female (sex determined by behavior and plumage) Western Scrub-Jay regurgitate a pellet onto a sidewalk in northwest Reno, Washoe County, Nevada (39° 54′ N, 119° 86′ W, elevation 1524 m). The scrub-jay was accompanied by an adult male jay and a dependent fledgling. The female had approached a food item on the ground but stopped about 1.5 m from it, turned slightly to the side, leaned forward and extended her head and neck slightly and appeared to be straining moderately. She stretched her head and neck out two more times, lowered her head, and gaped widely, regurgitating a moist pellet which dropped at her feet. The pellet was not expelled forcefully. The jay then hopped toward the food item, which she took and then flew off.

Using a pair of forceps, Elpers immediately collected the pellet and placed it in a plastic container. The pellet was well formed and had a surface coating of mucus holding it together securely. The wet weight at collection was 0.37 grams. The pellet was air dried (humidity ranged from 10 to 15% during the two-day drying period), after which it weighed 0.20 grams. When dry, the pellet measured 12.30 mm long × 7.8 mm wide × 4.78 mm deep (Figure 1).

The following day, Knight identified arthropod fragments and organisms in the sample to the extent possible. He placed the pellet in 70% ethanol, separated the constituents, and examined and identified the contents through a dissecting microscope. Elpers later counted and categorized the pellet contents.

Figure 1. Pellet cast by a Western Scrub-Jay in northwestern Nevada.

Photo by Mary J. Elpers

We found a total of 1741 fragments in the pellet. These included bits of insect chitin and softer tissue; insect and spider leg segments; partially digested insect wing bases and membranes; insect setae and bristles; insect mouth parts, cerci, and a genital capsule; two insect heads; a spider fang, tibia, and head capsule; four plant-tissue fragments; 14 plant seeds typical of those found in commercial bird-seed mixes; and 26 small grains of grit. Organisms found in the pellet that could be identified to order or family from the fragments available were three beetles (order Coleoptera; identified from black pitted elytra, mandibles, and a genital capsule), one of them a root weevil (family Curculionidae), probably *Otiorhynchus meridionalis*, a species common in and under shrubs in northwest Nevada (identified from a head, tibia, and elytra); an ant (order Hymenoptera, family Formicidae), probably *Tetramorium caespitum* (identified from a head and mandible); an earwig (order Dermaptera, family Forficulidae), probably the European earwig, *Forficula auricularia*, the only earwig common in the area (identified from a cercus); and a spider that could not be identified to family (identified from a head capsule, leg segments, and a fang). Other orders of arthropods may have been present but could not be identified. The number of individual prey could not be determined, as that number would depend on the extent to which the arthropods were digested, their size, and the heterogeneity of the various prey species (Craighead and Craighead 1956). The longest insect fragment measured 5.20 mm and the smallest was less than 1 mm in diameter.

Although a fair amount of information is available on the food and foraging habits of Western Scrub-Jays west of the crests of the southern California mountain ranges and the Sierra Nevada (Curry et al. 2002, Carmen 2004), such information is sparse for interior populations (Curry et al. 2002). In diet analysis, many small food items such as spiders and other arthropods are difficult to identify from a distance in the field. Thus much existing information comes from analysis of stomach contents of collected birds. Pellet collection and examination may provide another method of diet analysis for this species that is noninvasive compared to obtaining stomach contents by collecting the bird, using emetics, or flushing. Western Scrub-Jays spend time during daylight hours roosting, often using the same site day after day, and in suburban environments they have been observed using the same night roost on consecutive dates for months at a time (Elpers unpubl. data). Pellets possibly may be obtained by locating these sites and developing a way to collect any discharged there, adding to the data base on the Western Scrub-Jay's diet.

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