Western Bluebird (Sialia mexicana) fecal sac dispersal at Kellogg, Oregon

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Over a century ago certain parent birds of nestlings were observed dispersing fecal sacs at various distances and directions by dropping these sacs to the ground or water. In 1900 Herrick reported that bluebirds (Sialia sialis) "carry these packages several rods from the nest and presumably drop them,... [leaving] the nest sweet and clean and the nestlings immaculate." Two principal results of fecal sac removal are good nest sanitation and predator elusion.

The distance and direction of fecal sac dispersal from the nest have been reported with interpretation of this adaptive behavior in bluebirds and other passerines. Blair and Tucker (1941) reported their fecal sac study of over 70 European species. Morton (1979) studied fecal sac composition and dispersal by White-crowned Sparrows (Zonotrichia leucophrys). Weatherhead (1984, 1988) reported and further commented on fecal sac removal by Tree Swallows (Tachycineta bicolor). Petit and Petit (1987, 1988) compared their fecal sac research on Prothonotary Warblers (Protonotaria citrea) with other species.

Knowledge of fecal sac dispersal by birds is limited and continued fieldwork is warranted. Here I report on fecal sac dispersal of Western Bluebirds (Sialia mexicana) over 3 nesting periods.

This study of Western Bluebirds foraging for insects to feed nestlings and dispersing fecal sacs was conducted 58 km northwest of Roseburg, Oregon, in an open valley of the main Umpqua River corridor. My observations were made from 0730 to 1600 on an average of 5 days per week throughout the nesting period in 1995, 1997, and 1998. These observations were made from within 5 m of the nestbox and from the house 41 m north using a 40-power spotting scope and 10×50 binoculars.

The nestbox was 2 m off the ground on top of a corner garden fence post. With the nestbox being the point of origin, I established quadrants: NW, NE, SW, and SE (Fig. 1). From the nestbox, fecal sac dispersal in each quadrant was tabulated. Total number and exact location of sac dropping sites were easily determined; dropping sites remained undisturbed on the asphalt throughout the nesting period.

A nesting pair of Western Bluebirds successfully nested as migrants during the spring and summer when 3 nestlings were given food items taken by the adults from the apple orchard and walnut tree. These trees had not been pruned, sprayed with insecticides, irrigated, or cared for in 25 years; consequently, insects and other invertebrates were abundant. Food items taken to the nestlings included various life cycle stages of lacewings, leafhoppers, earwigs, bugs, beetles, flies, moths, butterflies, other insects, and arachnids. The dominant flight
pattern was from the nestbox to the orchard and walnut tree. After collecting food items, the bluebirds flew to the nestbox. On the return to the foraging area, fecal sacs \((n = 172)\) were dropped at distances of 9.5 to 43 m from the nestbox, with 56% of the sacs being dropped within 13–20 m (Fig. 2). Sixty-nine percent of the fecal sacs were dispersed in the direction of the orchard–walnut tree foraging area in the NW quadrant. Twenty percent were dropped in the NE quadrant, 8% in the SW quadrant, and 3% in the SE quadrant. The birds made no special flights to randomly scatter droppings. From results of my comparison of flights with and without fecal sacs, I concluded that 69% and 77%, respectively, of the flights were in the same direction (Fig. 3). Weatherhead (1984) observed that whenever a Tree Swallow departed from the nest carrying a fecal sac, it apparently flew to a foraging area after dropping the sac (as opposed to making a special trip to dispose of the sac).

Western Bluebirds did not intentionally and regularly fly eastward 38 m to drop fecal sacs in the water of the farm pond. Only 3% of the droppings were dispersed in that direction. Since the foraging area was 88 m in the opposite direction, flying to the pond would have been very energy-expensive. Petit and Petit (1987) and Weatherhead (1988) reported that Prothonotary Warblers and Common Grackles \((Quiscalus quisula)\), respectively, preferred to drop fecal sacs over water.

Fecal sacs were dropped initially 9–16 m from the nestbox; however, as nestlings progressively grew in size, so also did the dropping distance increase from the nestbox, with distance ranging from 16 m to 43 m. My conclusion from this observation is that as nestlings aged and became more valuable, parents carried the sacs progressively further from the nest.

In my field study, Western Bluebirds dispersed fecal sacs in a preferred direction of foraging. I observed no attempts to scatter sac droppings evenly in all directions from the nestbox nor to drop them over water. Considering the strength of the selective pressure that nest predators apply to birds, it is not surprising that ornithologists are gaining a renewed appreciation for fecal sac removal strategies.
LITERATURE CITED


HERRICK, F.H. 1900. Care of nest and young. Auk 17:100.


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