

OAK CATKINS AND BLACKBURNIAN WARBLERS: OPPORTUNISTIC FLOWER CONSUMPTION BY AN INSECTIVOROUS BIRD

Amentos de roble y reinitas gorjinaranja: consumo oportunista de flores por un ave insectívora

Carlos Julián Idrobo¹

Grupo de Investigaciones ANTROPOS, Universidad del Cauca / Fundación ECOHABITATS, Popayán, Colombia. cjidrobo@gmail.com

Eduardo Gallo-Cajiao

Programa de Biología, Universidad del Valle, Ciudad Universitaria de Meléndez, Cali, Colombia./ Fundación ECOHABITATS, Popayán, Colombia. eduardogalloc@yahoo.com

ABSTRACT

The diet of the Blackburnian Warbler (*Dendroica fusca*) has been reported to include mainly insects and occasionally fruits. We observed this species eating Andean Oak (*Quercus humboldtii*) catkins in the Colombian Andes. Apparently an opportunistic exploitation of a temporarily superabundant resource, this phenomenon has been reported for other wintering boreal migrants. We briefly review the effects of flower consumption for the plant and possible benefits for the bird.

Key words: Blackburnian Warbler, migrant birds, flower consumption, opportunistic behaviour, Colombian Andes.

RESUMEN

Se ha documentado que la dieta de la Reinita Gorjinaranja (*Dendroica fusca*) incluye insectos y ocasionalmente frutos. Registramos a esta especie consumiendo flores de robles (*Quercus humboldtii*) en los Andes colombianos, aparentemente una respuesta oportunista a un recurso temporalmente superabundante. Conductas oportunistas de este tipo han sido registradas para otros migratorios boreales en sus zonas de invernada. Reseñamos brevemente el efecto del consumo de flores para la planta y los posibles beneficios para el ave.

Palabras clave: Reinita Gorjinaranja, aves migratorias, conducta oportunista, consumo de flores, Andes colombianos.

The Blackburnian Warbler (*Dendroica fusca*) is a boreal migrant bird with a winter distribution ranging from Costa Rica south to northern Brazil, Peru and Bolivia. The species is most abundant in the northern region of the Andes, from Bolivia through northern Venezuela (Stiles & Skutch 1989, Curson et al. 1994), and it is the most common wintering warbler in the Colombian Andes (Chipley 1976, Hilty & Brown 1986, De La Zerda-Lerner & Stauffer 1998).

We observed Blackburnian warblers in a 17.5 ha

patch of Andean Oak forest at La Cabuyera ranch, 3 km north of Popayán, in the Central Andes of southwest Colombia (2°30'N; 76°31'W, elevation 1850 m). The landscape's matrix is dominated by pastures, with other elements such as crops (e.g., coffee, vegetables), stands of planted eucalyptus trees and suburban neighborhoods. Forest fragments surrounding Popayán have been altered due to selective logging, but some trees can reach 25 m in height. Some forest patches, including that in which we made our observations, are practically monospecific stands of Andean Oak (*Quercus hum-*

¹Current Address: Centre for Community-Based Resource Management, Natural Resources Institute, University of Manitoba, 201 -70 Dysart Road, Winnipeg, Canada, R3T 2N2



Figure 1. Blackburnian Warbler's behavior as described: typically perched (right), taking oak catkins (center), and swallowing them while perched (left). Illustration by Andrés Gallo C.

boldtii) (Behling et al. 1998, pers. obs.). However, in addition to Oak, occasional large trees of the Lauraceae family (*Nectandra acutifolia*, *N. lineata*, *N. umbrosa*, and *Cinnamomun triplenerve*) also occur (Alcázar 2003).

During an episode of intense flowering activity of the oaks on 11-12 December 2002, we watched eight Blackburnian Warblers between 08:00 and 09:30 using 10x25 Tasco binoculars. They were part of a mixed flock of small insectivorous birds (also including *Mniotilta varia*, *Parula pitiauyumi*, and *Myioborus miniatus*), which were travelling through the forest canopy. Blackburnian Warblers repeatedly made short flights to pluck staminate oak flowers from the catkins, swallowing them while perched on a nearby branch (Fig. 1). Subsequently, we checked some oak flowers in the surrounding area, finding no insects on them that could explain this behavior according to the known natural history of this species.

Previous authors have considered the Blackburnian Warbler to be mainly insectivorous, and occasion-

ally frugivorous (Hilty 1980, Curson et al. 1994). In the Neotropics, this warbler often forages with mixed flocks in the upper parts of the forest. It actively searches for insects by pecking twigs and branches and amid leaves, moss and lichens (i.e., reach-up; Remsen & Robinson 1990) or by making short flights to pluck prey from foliage or other substrates (i.e., sally-striking; Chipley 1976, Remsen & Robinson 1990, Curson et al. 1994, Morse 1994, de la Zerda-Lerner & Stauffer 1998, pers. obs.). This latter tactic was also used by the Blackburnian Warblers to collect the oak flowers, such that they were not modifying their normal foraging behavior, which could thus permit potential access to a wider spectrum of food resources than previously reported.

Although flower consumption, apart from nectar and pollen, has been infrequently documented in birds, it has been suggested that this resource could provide birds with a rich mix of lipids, proteins, and carbohydrates (Riley & Smith 1986). Although Blackburnian Warblers swallowed entire oak flowers, the nutritional value of these structures could

be limited. Andean Oak is a wind-pollinated species (Fernandez-M. & Sork 2007), a characteristic that is associated with protein-poor pollen and no nectar production. Indeed, North American species of *Quercus* do not produce nectar (Roulston et al. 2000, Kraemer & Favi 2005).

Considering the ecological relevance of flower consumption from the perspective of plants, it is important to note that whereas some birds consume flowers that are attached to the plants (e. g., Bharos 1997), some others only eat them after they have fallen to the ground (e. g., Kettle 1991). When flowers are removed from the plant, some birds consume only parts of the corolla (e. g., petals), leaving the flower's reproductive parts (i.e., pistils, stamens) intact. Nonetheless, it is unlikely that these florivorous birds play a role as pollinators (Riley & Smith 1986, Bharos 1997). On the other hand, the consumption of whole flowers could be considered a case of "predation" (Franklin 2005); thus, our observations suggest that Blackburnian Warblers could be considered "predators" of Andean Oak flowers.

Documented cases of flower consumption by birds involve species considered to be herbivorous (e. g., Kettle 1991), insectivorous (e. g., DeLay et al. 2002, Radford 1984), granivorous (e. g., Franklin 2005), and frugivorous (e. g., Riley & Smith 1986, Oliveira et al. 2002, Rodríguez-Mahecha & Hernández-Camacho 2002). In some frugivorous species the occurrence of this feeding behaviour might be related to periods of fruit scarcity, whereas in others it seems to provide a nutritional supplement. In the Neotropics, consumption of this resource has been reported more often among frugivores than in any other trophic guild (Riley & Smith 1986, Oliveira et al. 2002).

Although flower consumption appears to be rare in birds (Riley & Smith 1986), under some circumstances it may be more common. For example, during an "explosive" flowering event in Australia, flower consumption was reported in up to nine species from different trophic guilds (Franklin 2005). Additionally, occasional consumption of Andean Oak flower catkins by Acorn Woodpeckers (*Melanerpes formicivorus*) has been documented in Colombia (Kattan 1988). Therefore, since there is

no definitive explanation in the literature for flower consumption by insectivorous birds, we propose that our records of Andean Oak flowers eaten by Blackburnian Warblers represent an opportunistic behavior. This is consistent with the known tendency of Neotropical migrant birds to exploit superabundant or seasonally available resources in their winter territories (Karr 1976).

We thank Andrés Gallo C. for his fine drawing of the figure. Douglass Morse, Susana de la Zerda Lerner, Gary Stiles, Jennifer Lusk, and Sebastián Restrepo-Calle made helpful suggestions on the manuscript. Walter Boles, Walter Weber, Carolina Cajiao, Diego Calderón, Margarita Rios and Francisco Gallo kindly supplied useful literature. This work was supported by Idea Wild Biodiversity Conservation Organization, the Museo de Historia Natural and Grupo de Estudios en Manejo de Vida Silvestre y Conservación (GEMAVIC), Universidad del Cauca, Popayán, Colombia.

LITERATURE CITED

- ALCÁZAR, C. 2003. Evaluación de la vegetación y análisis multi-temporal de dos fragmentos de bosque subandino en el valle interandino del río Cauca, Municipio de Popayán, Colombia. Tesis. Universidad del Cauca, Popayán-Colombia.
- BHAROS, A. M. K. 1997. Unusual feeding pattern and diet of Crimson-breasted Barbet (*Megalaima haemacephala*). *Journal of the Bombay Natural History Society* 94: 411.
- BEHLING, H., A. J. NEGRET & H. HOOGHEIMSTRA. 1998. Late quaternary vegetational and climatic change in the Popayan region, southern Colombian Andes. *Journal of Quaternary Science* 13: 43-53.
- CHIPLEY, R.M. 1976. The impact of wintering migrant wood warblers on resident insectivorous passerines in a subtropical Colombian oak woods. *Living Bird* 15:119-141.
- CURSON, J., D. QUINN & D. BEADLE. 1994. New world warblers. Helm Identification Field Guides. Christopher Helm, A & C Black, London, UK.
- DE LA ZERDA LERNER, S. & D.F. STAUFFER. 1998. Habitat selection by Blackburnian Warblers

- wintering in Colombia. *Journal of Field Ornithology* 69: 457-465.
- DE LAY, L. S., S. H. STOLESON & M. FARNSWORTH. 2002. A Quantitative Analysis of the Diet of Southwestern Willow Flycatchers in the Gila Valley, New Mexico. Final Report to T&E Inc. USA.
- FERNANDEZ-M, J. F. & V. L. SORK. 2007. Genetic variation in fragmented forest stands of the Andean Oak *Quercus humboldtii* Bonpl. (Fagaceae). *Biotropica* 39: 72-78.
- FRANKLIN, D. C. 2005. Avian granivores consume flowers, not just seed, of the Top End Bamboo *Bambusa arnhemica*. *Northern Territory Naturalist* 18: 45-50.
- HILTY, S.L. 1980. Relative abundance of north temperate zone breeding migrants in western Colombia and their impact at fruiting trees. Pags. 265-271 in: A. Keast & E.S. Morton (eds.). *Migrant Birds in the Neotropics: Ecology, Behavior, Distribution and Conservation*. Smithsonian Institution Press, Washington, D.C., USA.
- HILTY, S. L. & W. L. BROWN. 1986. A guide to the birds of Colombia. Princeton University Press. Princeton. NJ, USA.
- KARR, J.R. 1976. On the relative abundances of migrants from the North Temperate Zone in tropical habitats. *Wilson Bulletin* 88: 433-458.
- KATTAN, G. H. 1988. Food habits and social organization of Acorn Woodpeckers in Colombia. *The Condor* 90: 100-106.
- KETTLE, R. H. 1991. Pair of Mallards eating cherry blossom. *British Birds* 84: 18.
- KRAEMER, M. E. & F. D. FAVI. 2005. Flower phenology and pollen choice of *Osmia lignaria* (Hymenoptera: Megachilidae) in Central Virginia. *Environmental Entomology* 34: 1594-1605.
- MORSE, D. H. 1994. Blackburnian warbler (*Dendroica fusca*). No. 102 en: A. Poole & F. B. Gill (eds.). *The birds of North America*. The Academy of Natural Sciences of Philadelphia, Washington, D. C.: The American Ornithologists' Union. USA.
- OLIVIERA, P. P. MARRERO & M. NOGALES. 2002. Diet of the endemic madeira laurel pigeon and fruit resource availability: a study using micro-histological analyses. *The Condor* 104: 811-822.
- RADFORD, A. P. 1984. Spotted Flycatcher eating wisteria petals. *British Birds* 77: 425.
- REMSEN, J.V. & S.K. ROBINSON. 1990. A classification scheme for foraging behavior of birds in terrestrial habitats. *Studies in Avian Biology* 13: 144-160.
- RILEY, C. M. & K. G. SMITH. 1986. Flower eating by emerald toucanets in Costa Rica. *The Condor* 88: 396-397.
- RODRÍGUEZ-MAHECHA, J. V. & J. I. HERNÁNDEZ-CAMACHO. 2002. Loros de Colombia. Conservation International, Tropical Field Guide Series. Bogotá, D. C., Colombia.
- ROULSTON, T. H., CANE, J. H. & S. L. BUCHMANN. 2000. What governs protein content of pollen: Pollinator preferences, pollen-pistil interactions, or phylogeny? *Ecological Monographs* 70: 617-643.
- STILES, F. G. & A. F. SKUTCH. 1989. A guide to the birds of Costa Rica. Cornell University Press. Ithaca, NY, USA.

Recibido: 27 junio 2006

Aceptado: 10 octubre 2007