The Hungry Bird: Possible Fly Food of Golden-crowned Warbler at Mitchek Ranch

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One of the most remarkable birding events to ever occur in Colorado, if not THE most remarkable, was Glenn Walbek's discovery of a Golden-crowned Warbler at Mitchek Ranch in spring 2018. We all look forward to Glenn's formal account of this discovery in "Colorado Birds."

Like most of us, I made the pilgrimage to Cheyenne County in hopes of laying eyes on a species not on any of our radars (come on, admit it). During my visit on 21 May 2018, I was, of course, moved to emotion when that little gem popped into view. During perhaps the second lull between its rather infrequent, frenzied appearances, I started really looking at the scene. What was it that enticed this off-course neotropical beauty to stop there, and what sustained it for several days? As anyone who was there knows, the answer was thickets of chokecherry (*Prunus virginiana*). More specifically, it was insects, literally hundreds of thousands of them, attracted to the ephemeral flowers of those chokecherry bushes. It occurred to me that when the chokecherries were finished flowering, the bird's stay at Mitchek Ranch might also be finished. Indeed, as best we know, when the south to north blooming sequence of chokecherries ran its course, no more observations were reported.

When the bird was visible, like most of us, I was torn regarding how best to spend this time: just ogle it, note every detail of its plumage, listen for any vocalizations, try for photographs, and in my case, see if I could discern what it was eating. The first option was easy and I did that. Ditto for the second, with its interesting juxtaposition and array of hues like nothing I had ever seen. I heard a few unimpressive chips but never a song. I got OK photographs but probably nothing like what others got.

Regarding the last option of discovering its diet, I will admit here and now to sinning. I waited, and waited, and waited until the last birder of the day went home. At that point I got my insect net from the car trunk, walked about 10 meters "out of bounds", swept the net through the chokecherry flowers in a few spots, transferred the catch to my killing jar and took the entomological bounty back to Fort Collins for examination. For the record, the Golden-crowned Warbler was seen over the next few days, so it is fair to say my brief immersion into its world was not harmful to its continued existence at the site. Yes, I went where we birders agreed not to go for about 30 seconds. If this warrants my ouster from the clan, so be it.

The great majority of what was buzzing about the chokecherry flowers and landing on the leaves were flies, a wide assortment of flies, many of them quite tiny (with some being less than 2mm in length). Earlier in the day, while

watching the bird capture insects, I had a strong suspicion about one particular fly being important to it, and those were, indeed, in the net mix.

It took hours to pin and point the insects in the sample. A "point" is a small paper triangle shaped like a door stop to which an individual, tiny insect is glued to the triangle tip and then a pin placed through the wide side of the triangle (Figure 1).

Figure 1. Small fly (*Leptometopa* sp. in family Milichiidae) from Mitchek Ranch showing a point, data label (gray, below pointed insect) and determination label (white, at bottom) with insect pin adjoining the whole arrangement. Photo by David Leatherman.

Since most of the catch was flies, my friend and colleague at Colorado State University's Department of Bioagricultural Sciences and Pest Management Dr. Boris Kondratieff facilitated their being sent to Dr. Scott Fitzgerald. Dr. Fitzgerald is a former graduate student of Dr. Kondratieff who specializes in flies, especially the family of the one I suspected as being important to the warbler, and who is affiliated with Oregon State University. Dr. Fitzgerald, also a birder, graciously agreed to look at the Mitchek Ranch material and provided his best efforts as to their identities.

The following is an annotated list of the flies Dr. Fitzgerald identified. I consider this a partial but significant inventory of the "food store" where the Golden-crowned Warbler shopped. We do not really know what it was putting in its cart. The comments associated with each are mine regarding the ecological role of these flies and the likelihood the warbler utilized them as a significant component of its Mitchek Ranch diet (Borror et al, 1964). This is PURE SPECULATION on my part. The main criteria are what I saw the bird doing, how abundant the particular fly seemed to be, and how big the potential prey item was. Only photos that show an identifiable object in the bird's beak would serve as proof of part of its diet. If anyone has such photos I would welcome receiving them and am willing to report in this space what the photos reveal.

ANNOTATED LIST OF FLIES SAMPLED FROM CHOKECHERRY AT MITCHEK RANCH ON 21 MAY 2018

Most specific name	Family	Family Name
Sepsis pectoralis	Sepsidae	Black Scavenger Fly

Figure 2. Sepsid fly (*Sepsis pectoralis*) from Mitchek Ranch chokecherry flowers, 21 May 2018 (actual body length 3mm). Photo by David Leatherman.

Saltella sphondylii	Sepsidae	Black Scavenger Fly

Sepsid larvae occur in dung, decaying vegetation or carrion.

Syritta pipiens	Syrphidae	Flower Fly (or Hover Fly)

A wasp mimic which feeds on nectar as an adult. Larvae scavenge wet organic matter.

Cochliomyia macellaria	Calliphoridae	Secondary Screwworm (Blow Fly)

Feeds on dead flesh, historically used in forensics to determine post mortem.

Figure 3. Secondary screwworm fly (*Cochliomyia macellaria*) from chokecherry flowers at Mitchek Ranch, 21 May 2018 (actual body length 8mm). Photo by David Leatherman.

Neomyia cornicina	Muscidae	Green-headed Green Bottle Fly

An introduced, common species that feeds on a wide variety of liquids and plant nectar.

Figure 4. Green-headed green bottle fly (*Neomyia cornicina*) from chokecherry flowers at Mitchek Ranch, 21 May 2018 (actual body length 7mm). Photo by David Leatherman.

Haematobia irritans	Muscidae	Horn Fly

Introduced from Europe. Larvae on dung, adults on cattle blood. Kansas is range center.

Neomyia cornicina	Muscidae	House Fly Group

Introduced from Europe. Larvae and adults mostly on dung.

Unnamed "house fly"	Muscidae	House Fly Group

Liquids and plant nectar.

Thaumatomyia sp.	Chloropidae	Frit Fly (also called Grass Fly)

Homalutoides? Sp.	Chloropidae	Frit Fly (also called Grass Fly)

Larvae feed on grass.

Figure 5. Frit fly (*Homalutoides*? sp.) from chokecherry flowers at Mitchek Ranch, 21 May 2018 (actual body length 3mm). Photo by David Leatherman.

Liohippelates sp.	Chloropidae	Frit Fly (also called Grass Fly)

Attracted to eye fluids of animals and humans (non-biting).

Drapetis sp.	Hybotidae (Empididae)	Dance Fly
Rhamphomyia sp.	Hybotidae (Empididae)	Dance Fly
Platypalpus sp.	Hybotidae (Empididae)	Dance Fly

Predaceous on other small insects, possibly white flies.

2+ unnamed species	Tachinidae	Tachinid Fly

Larvae are parasitoids, usually of moths and butterflies.

Villa sp.	Bombyliidae	Bee Fly

Figure 6. Flower fly (*Villa* sp.) from Mitchek Ranch chokecherries, 21 May 2018 (actual body length 7mm). Photo by David Leatherman.

Unnamed, small bee fly	Bombyliidae	Bee Fly

Larvae probably feed on either grasshopper eggs or caterpillars.

Unnamed midge	Chironomidae	Chironomid Midge

Larvae are aquatic, adults perch on plants and other surfaces, eaten by many birds.

Leptometopa sp.	Milichiidae	Milichiid Fly
Dasmometopa varipalpis	Milichiidae	Milichiid Fly

Little known of biology.

Colboldia fuscipes	Scatopsidae	Minute Black Scavenger Fly

Larvae on fungal mycelia and decaying plant/animal tissue.

Euarestoides acutangulus	Tephritidae	Fruit Fly

Adults on flowers, larvae likely on plants in the sunflower family (Asteraceae)

Figure 7. Fruit fly (*Euarestoides acutangulus*) from chokecherry at Mitchek Ranch, 21 May 2018 (actual body length 2mm). Photo by David Leatherman.

Unnamed biting midge	Ceratopogonidae	Biting Midge (or No-See-Um)

Larvae are aquatic, adults feed on animal blood.

At least two unnamed anthomyiid flies	Anthomyiidae	Root Maggot Fly

Habits are varied ranging from scavengers to plant feeders to predators.

Figure 8. Anthomyiid fly from chokecherry flowers at Mitchek Ranch, 21 May 2018 (actual body length 3-6mm). Photo by David Leatherman.

Two species of dance flies	Bibionidae	March Fly ("Lovebugs")

Larvae feed on live plant roots or decaying vegetation, adults often on **flowers**.

Figure 9. March flies in the genus *Bibio* at Lamar Community College, 28 April 2015. Being heavily fed upon by Yellow-rumped and Nashville Warblers (actual body length 6-8mm). Photo by David Leatherman.

In summary, in the net sample Scott found at least 29 species of flies, representing 27 genera and 16 families. In addition to these flies, I saw or collected sweat bees in the family Halictidae, butterflies (including field crescents, red admirals and painted ladies), assassin bugs (Reduviidae) and a stink bug (Pentatomidae).

With flies accounting for the overwhelming biomass of insect prey within the chokecherry thickets to which the Golden-crowned Warbler showed allegiance, my starting assumption here is that it mostly ate flies. Certainly that could be wrong, but I do not think so. Based on a combination of relative abundance (both by observation and in the sample), body mass and ease of capture, my best guess as to which flies comprised the bulk of the Golden-crowned Warbler diet (in order from most important to least) would be march flies, anthomyiids, tachinids, muscids and possibly sepsids. When they were available, the bird probably also captured syrphids, calliphorids and bombyliids. Of the taxa present at this site, and biased by what I have seen other warblers on the eastern plains capitalize on in spring, my suspicion is bibionids were THE most important food. They are big relative to most of the other available prey, perch conspicuously on the exterior of plants and other objects, and are slow moving while airborn.

Maybe when Glenn or some other sharp-eyed individual spots the next Golden-crowned Warbler at Mitchek Ranch in 2046, cameras with high resolution, 100X

zoom capability will exist within the income level of mortal birders and somebody can prove the above speculation right or wrong. Let us hope so.

ACKNOWLEDGMENTS

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LITERATURE CITED

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