Yellow-throated and Blue-headed Vireos in Ontario: 6. Interspecific Interactions, Maintenance Activities, and Molt

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In this final article in the series, the reader may assume once again that the lives of the Yellow-throated Vireo (*Vireo flavifrons*) and the Blue-headed Vireo (*V. solitarius*), formerly Solitary Vireo, are similar unless otherwise noted.

INTERSPECIFIC INTERACTIONS

Other Vireos

The Yellow-throated Vireo did not respond to the songs of either Red-eyed (*V. olivaceus*) or Warbling (*V. gilvus*) Vireos (James 1968), two other vireo species regularly associated in southern Ontario. Yellow-throated Vireos only chased these other species if they ventured too close to a nest. I saw Warbling or Red-eyed Vireos singing within 20 m of a Yellow-throated Vireo nest and remain unchallenged. On two occasions, I have encountered Warbling Vireos nesting within 15 m of a Yellow-throated Vireo and once a Red-eyed Vireo nest within 25 m, and there was no animosity unless one got too close to the other's nest. After the young leave the nest, I saw family groups of two species foraging together without conflict.

The only other vireo I saw in the same habitat with the Blue-headed Vireo in Ontario was the Red-eyed Vireo. The latter tended to occupy different parts of the forest, remaining more in pure deciduous growth. Some close contact, however, does occur. I saw the two species foraging within a few metres of each other in the same tree with no animosity. Again, they chased each other only if one ventured too close to the other's nest.

In Ontario, because of different distributions, Blue-headed and Yellow-throated Vireos are unlikely to come into contact on nesting territories, and I never observed any interactions. They were not responsive to playback of each other's song here. In western Pennsylvania, where they occurred closer together and might be found nesting close together, there was also little or no reaction by either species to tape recordings of the other's song, so I would not expect any greater conflict there.

Most Other Smaller Birds

I saw Yellow-throated and Blue-headed Vireos chasing many other small birds, including warblers, flycatchers, chickadees, nuthatches, waxwings, orioles, robins, grosbeaks, sparrows, woodpeckers, and blackbirds. Any bird would be chased

when near a nest. Smaller birds like warblers were chased directly, and left immediately. Some of the larger birds, like kingbirds or flickers, may have left only when they had been harassed enough; the vireos dove down from above, and gave a bill snap or a quick short *spat* sound right above the intruder's head.

I saw unmated Yellow-throated Vireos tolerate Common Grackles (*Quiscalus quiscula*) and Red-winged Blackbirds (*Agelaius phoeniceus*) at close range, until there were eggs or young in a nest, and then they would be chased 25 to 30 m from a nest tree. When young birds were out of the nest, these blackbirds were still chased for as long as two weeks after the young had left the nest.

Small flycatchers, warblers and other birds in turn chased the vireos should they come too close to the other species' nests. The vireos fled, but only for a short distance, enough to avoid further conflict.

Hawks, Crows, Jays and Owls

I have observed only one encounter between a large *Buteo* hawk and a Yellow-throated Vireo. In this instance, the vireo left a nest, and with a number of other small birds, mobbed the hawk as it flew off. Cooper's Hawks (*Accipiter cooperii*) have been known to kill these vireos (Hammerstrom and Hammerstrom 1951), but the vireos have also been known to nest in close association with them (Bent 1950).

The only hawk I have observed in the vicinity of Blue-headed Vireo nests was the Broad-winged Hawk (*Buteo platypterus*). One vireo nest was built within 60 m of an occupied broadwing nest. In the half dozen times I saw the hawk land relatively close to the vireos, I never saw them attempt to chase it, even when a robin (*Turdus migratorius*) noisily attacked one. The vireos would continue to build the nest as long as the hawk remained some distance away.

When there were eggs or young in the nest, the vireos were more easily alarmed, but not so much at the hawk itself. When a hawk started to scream, it was screaming at me. This in turn got the vireos alarmed. One day, I had been sitting at a vireo nest for half an hour before the hawk began screaming. The vireos only then began scolding me. As soon as I moved away, they stopped scolding, even though the hawk was still screaming. In another instance with a screaming hawk, the female vireo would not get off a nest when the male came to exchange places, and the male fell silent, until the hawk moved away. The vireos probably have little reason to be concerned about Broad-winged Hawks. However, I have seen the remains of young birds (not vireos) in broadwing nests.

Bowles (1895) indicated that he commonly found Blue-headed Vireo nests in association with Cooper's Hawks. Bent (1950)

reported similar experiences, and found that the hawks did not molest the vireos. Forbush (1929) stated that the Blue-headed Vireo has been found in woods with Northern Goshawks (*Accipiter gentilis*), Red-tailed (*Buteo jamaicensis*), and Sharp-shinned Hawks (*A. striatus*). Simpson (1914) reported an undisturbed nest directly under a goshawk nest. An alert, healthy pair of vireos probably need have little concern about larger hawks, at least.

I saw only Yellow-throated Vireos bothered by American Crows (*Corvus brachyrhynchos*). The crows were usually not attacked, but the vireos perched near and uttered a constant stream of loud scolding calls until the crow left. Blue Jays (*Cyanocitta cristata*) were attacked with great vigour by either species the moment they appeared anywhere near a nest. They were chased for 50 to 100 m from a nest. Jays are obviously recognized as predators.

Van Camp and Mayfield (1943) reported the remains of a Yellow-throated Vireo in a Long-eared Owl (*Asio otus*) nest. I have never witnessed an encounter between an owl and a living vireo. Owls no doubt occasionally take vireos, but may be a relatively minor cause of mortality in nesting areas.

Cowbirds

Yellow-throated Vireos invariably reacted to the presence of a Brown-headed Cowbird (*Molothrus ater*) at any stage of nesting, from building through fledging. If a cowbird suddenly landed somewhere near a nest, the vireos might "freeze" to avoid being seen. More often, they gave high intensity alarm calls. *Alarm calls* are high pitched pure tone calls that are more difficult to locate, and are given usually when the bird is concealed at least partly, and motionless; as opposed to *scolding calls* which are noisy, easily located, and the birds are usually conspicuous, and attacking the object of the scolding.

Cowbirds were usually chased with scolding calls after an initial alarm, or when the vireos could move without revealing a nest. Cowbirds were chased by Yellow-throated Vireos even when there were young in the nest. I did not observe the response of a Blue-headed Vireo to a cowbird.

People

I have indicated the extreme sensitivity to people at the time of pairing (James 1996). On the first day or two of nest building also, I have moved at the wrong time, revealing my presence, and have heard high intensity alarm calls, indicating that they perceived a considerable threat. On occasion, this might have caused them to abandon a nest and start elsewhere. In later building, as long as I remained unobtrusive, there was usually not much indication of alarm. They may have given a low intensity alarm call as I approached,

particularly the first time I moved in close enough to watch.

But, once eggs were laid, reactions were usually fairly mild, although they varied greatly depending on the pair of birds involved. Most just sat quietly on the nest even when approached fairly closely. One pair of Yellow-throated Vireos nested in a parking lot, paying no attention to cars and people below. Through incubation and brooding stage, most reacted somewhat more strongly the first time I approached a nest, and much more mildly thereafter. But, once off the nest, they usually flew about giving scolding calls.

I encountered one female in each of these two species that did not leave a nest until I took a wing tip and gently lifted her from her eggs. They clung to the nest briefly, but then flew off and scolded mildly. One female Yellow-throated Vireo allowed me to stand in the tree about 1.5 m away while she brooded and came to feed the young.

However, once young were no longer brooded, the parents again seemed much more agitated by people (and other predators). I was scolded when 30 m from one nest tree, where previously I was ignored below the nest. I was scolded while just walking down a road, by a male with a young long out of the nest and well able to fly. I watched one pair of Yellow-throated Vireos over many days through the nesting period in a nest right over a gravel road. But, on one day when they had 10 day old young, I had been sitting in a car watching for some time. And as soon as I began to open the door to get out, I heard them give high intensity alarm calls. I had never heard them give this call before.

In general, Blue-headed Vireos gave a milder response to my presence, and seldom did one ever dive at my head and snap its beak as many Yellow-throated Vireos did. However, there was considerable variation in the response of any pair of either species. Blue-headed Vireos usually only scolded mildly when roused from a nest, and some made no sound at all. But, I had one female that refused to leave a nest and eggs for over an hour, although the male came several times, as she was aware of my presence some distance away. And once, the first time I approached a nest with older young, a pair gave high intensity alarm calls.

Other Species

These vireos seemed to recognize squirrels as predators. A passing Red Squirrel (*Tamiasciurus hudsonicus*) caused a pair of Blue-headed Vireos to "freeze" and remain silent. I saw Blue-headed Vireos actively chase Red Squirrels, and Yellow-throated Vireos chase Gray Squirrels (*Sciurus carolinensis*) that approached a nest area.

I have observed blackflies (*Simulium* sp.) flying about the

heads of incubating Blue-headed Vireos. They probably suffer some from the presence of these flies, as do their observers!

MAINTENANCE ACTIVITIES

Bill Wiping

One of the most obvious activities of both species was drawing the beak from the base to the tip, on alternate sides, up the side of the branch on which they were perched. This was seen several times after catching and eating food. Even young, two days out of the nest, did it. It serves to remove foreign matter from the beak to keep it clean. Bill wiping can also sometimes be seen after preening. Large items adhering to the beak will be dispelled by just rapidly turning the head and flicking the bill from side to side.

Preening

Preening the body feathers was a commonly seen activity among adults as well as young of both species. In July, before molting, I saw adults preening as many as three times an hour, standing for five to twenty minutes each time. During preening, body feathers were typically raised somewhat. The bird put its beak into the feathers at the base of the tail (to get oil from the uropygeal gland) for a few seconds before preening. They worked mainly with the beak (not by rubbing their whole head over the body), working it among the feathers or drawing the long wing and tail feathers from the base to the tip through the bill. The birds often closed their eyes as they preened. The head was frequently scratched with one or the other foot. Always, the wing was lowered and the foot brought forward over the wing to reach the head (in both species).

Stretching usually accompanied preening. Here the wings were partially spread and raised over the back until they touched or almost so, and then were slowly relaxed. Or, one leg was extended back and to one side, and the corresponding wing drooped and pushed out along the leg until fully extended, then slowly relaxed. When a preening bout was over, the bird would ruffle all its feathers, shake itself, and then relax its feathers back into place. I saw what appeared to be a yawn on only a few occasions.

Sunning

These vireos usually chose a perch in the sun to preen. Accompanying preening, I several times observed sunning (see Figure 1). The bird usually turned one side to the sun, and then rotated its body slightly, turning that side up toward the sun. The body feathers were ruffled and the tail fanned. The wing opposite the sunny side was generally drooped and placed against the perch to support them. The wing toward the sun was partially spread over the back or the side. The neck

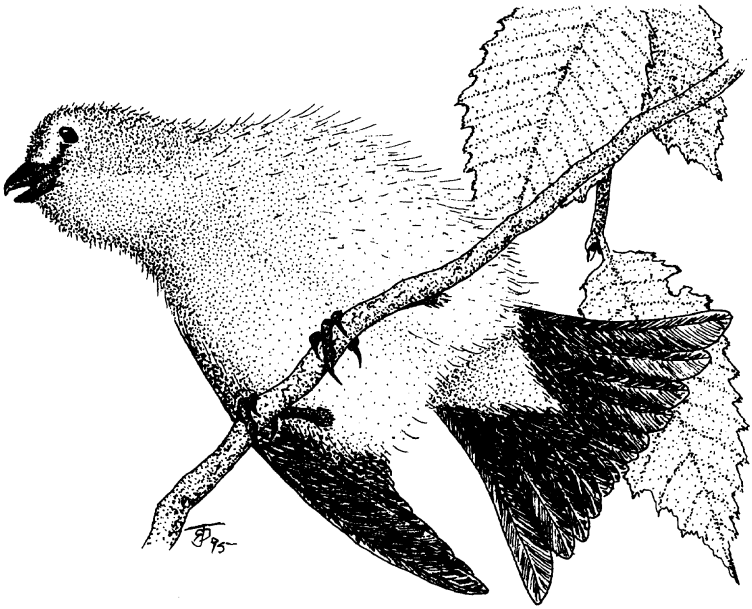

Figure 1: Drawn from a slide of a Yellow-throated Vireo sunning. The sun is shining from the upper right, and the bird has turned its left side to the sun. Drawing by *Ross D. James*.

was stretched out. The bird was silent although the beak was usually held open, probably to facilitate heat escape. Sometimes they would stand with the back to the sun, again with all body feathers ruffled and tail fanned, but wings folded or nearly so.

I never saw anting, and Simmons (1957) indicated that none of the vireos were known to exhibit that behaviour.

Bathing

I never actually observed bathing by either species, but once saw a Yellow-throated Vireo fly up from a river edge on a sunny day, where there were no shrubs in which it could have been perched. It had water dripping from it and looked very wet. After shaking, it proceeded to preen.

I have also observed similar shaking of ruffled wet-looking feathers by a Yellow-throated Vireo after a rain. Rain bathing could be a more usual means of bathing in these vireos. Bassett (1926) described bathing in Cassin's Vireo (*V. cassinii*) over a swimming pool. The bird apparently flew over the water, "dipping" on the wing.

Parasites

I have found several Yellow-throated Vireo nests with northern fowl mites (*Ornithoryssus sylvarium*).

When seen, they usually occur in profusion. I watched one female stand over the nest, and pick at her legs and feet as well as at the nest and supporting branch, to pick off these tiny mites. I never felt these were the cause of any mortality. Some have reported "parasites" so numerous as to kill the young or drive away the parents (Clark 1890, Maxon 1902). They gave no indication of what the parasites were, although one called them "lice".

I have never observed mites on a Blue-headed Vireo nest, but Weygandt (1907) reported "lice" on a nest at a more southern latitude. In northern parts of their range, external parasites do not seem to be much of a problem.

MOLT

Young grow their first set of feathers while in the nest, and look much like adults upon leaving the nest. Tail, and probably most, feathers complete their growth after nest leaving. Within a couple of weeks of nest departure, young begin another partial molt of body feathers and wing coverts. The hatch year birds then undergo a complete molt of body feathers, but not the larger wing and tail feathers, in late summer at the same time as adults undergo a complete molt of all feathers. Somewhere between the partial and the complete body molts, the young also seem to lose at least some outer tail feathers. Young are then almost indistinguishable from adults. For further details, see Rodewald and James (1996) and James (1998).

Adults begin to lose large flight feathers about mid-July, only a few at a time. Then by early August become very quiet, secretive and unresponsive to tape recorded song. They tend to remain high in forest trees. Within about ten days, adults have a short new tail growing in, or only a couple of feathers (the outer) may remain, and body feathers still look very ragged. But, after about two weeks, the plumage looks much newer, although feathers are probably not fully grown (the tail obviously is not). It takes another week or so for feathering to look new. Larger wing feathers are also usually replaced by the end of August. Some birds may molt later than others, particularly the Blue-headed Vireos that may be several weeks behind. A few body feathers may still be growing in during the autumn migration.

Bent (1950) indicates that the Blue-headed Vireo may undergo a partial irregular molt in the spring. Sutton and Pettingill (1942) reported molting specimens from Mexico in March, and there are several molting specimens in the Canadian Museum of Nature taken in winter. Yellow-throated Vireos also undergo a partial spring molt (Rodewald and James 1996). The extent of these molts is unknown, and they may even be irregular.

Discussion

As formerly discussed (James 1997), Yellow-throated and Red-eyed Vireos seem to reduce competition when occupying the same habitats by occupying different levels of the forest, and the Yellow-throated Vireo seems to nest higher where the two co-occur (Williamson 1971, James 1979). Yet one sees virtually no interspecific aggression when the two are seen together, and they do not respond to each other's songs. This seems somewhat contradictory.

However, it is possible that there is more than meets the eye, and that avoidance may be particularly significant on a few days at the very beginning of the season when territories are being established by the males. Each species may wish to reduce the level of contact with another species likely to be moving through the same spaces during the subsequent nesting period. Neither tolerate any other species close to a nest site, and the chances of increased conflict close to nesting sites is likely to be greatest among closely related species, going similar places in a habitat.

Even the presence of another species, and obviously its territorial song, could be enough to induce two species to move somewhat apart, without physical contact. This scenario is supported by several examples of habitat co-occupancy in the genus *Vireo*, where different species choose different levels of the habitat (Hamilton 1962) or maintain mutually exclusive territories, relying on song to effect spacing while avoiding physical encounters (Barlow et al. 1970, Rice 1978). The fact that Yellow-throated and Red-eyed Vireos are still able to occupy the same habitat suggests that the avoidance is as much one of reducing conflict with another species as specifically another vireo.

As previously indicated (James 1997), Blue-headed and Yellow-throated Vireos have probably diverged in nesting height during a former era. They now seem well able to discriminate species by song, so even if they were to be in close contact there is not likely to be much competition between them. They have been known to form a mismatched pair. Hauser (1959) described a female Blue-headed Vireo paired with a male Yellow-throated Vireo; a nest was built, but no eggs were ever laid. This is probably a very exceptional circumstance. There are also several examples of these species singing the other species' song, but that is more likely to be the result of learning the wrong song than of hybridization (James 1984). There is little reason to expect that interspecific competition would be more than casual between these two species.

There have been numerous comments in the literature over the years about the "tameness" of Yellow-throated and Blue-headed

Vireos toward people (e.g., Harrison 1975). There are certainly some birds that allow close approach. However, as I have found, it is usually only at certain stages of the nesting cycle (not early or when large young are present). Furthermore, it is hardly tameness (i.e., having lost wildness, domesticated) as much as it is tolerance to intrusion. That tolerance has certainly made my studies even possible, and much more enjoyable.

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