NORTHBOUND MIGRATORY PHENOLOGY OF NORTHERN FLICKERS IN THE ADIRONDACKS

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Spring migration arrival of the Northern Flicker (*Colaptes auratus*) in New York's Adirondack region is synchronous with the emergence of ants from their subterranean winter dormancy, typically during the middle of April. The dates at which ants emerge from their winter chambers, and at which flickers migrate north in spring, correspond toThe corresponding the 42° F temperature isothermat which ants emerge from their winter chambers, and at which flickers migrate north in spring 42° F. Data from future years may indicate whether temperature or date per se best predicts these events.

Phenology is the study of the influence of climate on seasonally cyclic natural phenomena such as the flowering and fruiting of plants and the migration of birds. I have been documenting the arrival of spring in the Adirondacks for many years and have collected data on many quintessential spring events, such as the breeding of wood frogs, the arrival of migratory birds (e.g., Eastern Phoebe and Tree Swallow), the emergence of plants (e.g., coltsfoot), and the appearance of over-wintering butterflies (e.g., Compton's Tortoiseshell and Mourning Cloak). For some of these events I have data stretching back a full 12 years.

About 7 years ago I began documenting the first appearance of ants in spring as they emerged from the subterranean chambers in which they spend the winter. A few years later I began to see a pattern developing between the emergence of ants and the arrival of the Northern Flicker on my lawn to feed. It seemed logical that this correlation would be a strong one, since the diet of the flicker is high in ants.

Alexander Martin (1961) reports that half the animal diet of the Northern Flicker consists of ants and beetles. Bent (1964, p. 277) reports that 61% of this species' food consists of animal matter; that about 75% of the animal food (45% of the all food) consists of ants; and that ants were found in 524 of 684 stomachs examined, about 77% of the total. These data suggest that this species likely eats more ants than any other bird in our region.

I have only a few years of data supporting a correlation between the phenology of ants and flickers, but I thought it would be valuable to report it so that others can continue to test this relationship to either confirm or reject what I am tentatively suggesting here.

In the spring of 2004, medium-size ants with black heads and abdomens and maroon thoraxes were observed on 21 Apr, and small light brown ants (pavement ants) on 22 Apr. That year the flicker arrived on our lawn almost on the same date, 20 Apr. Viewed with binoculars it appeared to be feeding on very small things, more than likely ants. In the spring of 2003 small light brown ants first appeared on 17 Apr, and the flicker was seen feeding in our lawn on the previous day, 16 Apr. In the spring of 2002 small light brown ants appeared on 13 Apr, and the

flicker was first seen feeding in our lawn on 18 Apr. That year I noticed it was feeding on large white beetle grubs, but it also could have been feeding on ants as well. For three consecutive years therefore the emergence of ants and the appearance of flickers coincided very closely.

Benson (1962) says that much has been written of birds and their migration. But day lengthening alone does not control their rates of movement; temperature and food supplies are guiding factors. Let's look at this a little more closely. I have seven years of data for the emergence of small light brown ants in Elizabethtown, New York at an elevation of 990 feet above sea level. The average emergence date is 19 Apr, with a range from 10 Apr to 27 Apr. We can determine the approximate temperature isotherm at which these ants emerge in the spring using local climatological data. From Burlington, Vermont, almost directly across Lake Champlain from Elizabethtown, the average temperature for 19 Apr is 45° F. The April temperature in the village of Elizabethtown however is on average about one degree F cooler than in Burlington (National Weather Station BTV Elizabethtown Normals). In addition the village of Elizabethtown is at about 600 feet above sea level and my observations were made at about 990 feet above sea level, so we must make another correction for elevation. I've observed that flowering of dandelions are about three (3) days later at elevation 990 feet than at 600 feet above sea level. This is what is usually reported for the advance of spring up mountainsides— one day for each 100 feet elevation (Kudish 1975). If we look at this same average climatological data for Burlington, three days in April is equivalent to about 2 degrees F difference in temperature. So that means that these ants emerge at about 42° F.

Does this make sense? Let's cross-check our estimates with other biological events, which we know occur at a particular temperature. Those who keep ants for a hobby say that you should hibernate your ants at 4-6 degrees Celsius, which corresponds to 40° to 43° F. As 42° F is right in the middle of that range, we have good agreement there. In addition Ludlum (1980) says that spring across the northeast quarter of the United States does not begin until the daily mean temperature has risen to 43° F, the thermal point at which early vegetation begins to come out of dormancy. The first flowering plant in the North Country to come out of dormancy is coltsfoot (*Tussilago farfara*). My 12 year average for coltsfoot bloom at 990 feet elevation in the Adirondacks is 18 Apr, which corresponds to the 42° isotherm—another near-perfect correlation. So yes, these calculations make sense.

Still, the data I have presented so far do not prove that temperature itself is the factor that determines flicker migration. What is needed is a series of years in which the arrival of flickers corresponds more closely to the temperature (and the emergence of ants) than to the average date of 19 Apr. In other words, in years in which flickers precede their long term average, the isotherm should precede that date also, and vice versa.

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