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SEX-SPECIFIC FEEDING RATES AND PROVISIONING OF FRUIT TO NESTLING BELL'S VIREO -- Provisioning of fruit to nestlings and possible sex-specific differences in feeding rate have not been reported for Bell's vireo (*Vireo bellii*; Brown 1993). While studying nesting ecology of Bell's vireo on Konza Prairie Biological Station, Geary and Riley counties, Kansas, I quantified feeding rate by sex and food type delivered to nestlings. Sex was determined by capturing adults with mist-nets and inspecting for a cloacal protuberance, as well as conducting behavioral observations of uniquely-marked individuals. Males sing regularly while moving around territories, as well as during incubation (Nolan 1960). I assigned "female" to the individual in these socially monogamous pairs that did not sing or appear to regularly patrol territorial boundaries.

One-hour feeding samples were assigned randomly among five nests between 0600 and 1900 CST, preceded by a minimum 15-min interval. I used a 20-60x Bushnell spotting scope in blinds 15 to 25 m from nests to sample provisioning to nestlings between 24 June and 15 August 1986. Nests contained three or four Bell's vireo nestlings within one day of age of each other. At all but one nest, males made the majority of feedings between days one and seven post-hatch (mean 62%, range 33-83%; n = 26 visits). No differences were apparent in adult feeding rate by sex from eight days post-hatch until fledging at day 12 to 14, although a single nest received only female feedings the day of fledging (female mean 56%, range 42-100%; male mean 44%, range 0-58%; n = 36 visits). There were no detectable differences in prey size or type delivered by each sex.

I also noted rough-leaved dogwood (*Cornus drummondii*) fruit being fed to nestlings, as well as fruit consumption by adult Bell's vireo. These observations were made at a nest attended by two color-banded adults, located 1.1 m off the ground in a 2.5 m-high rough-leaved dogwood. All 40 nests monitored during this breeding season were in comparable microhabitats (Farley 1987). On 5 August, while brooding three 4-day old nestlings, the adult male expelled several rough-leaved dogwood stones into the nest. During a subsequent 35 min brooding interval by the adult female, she was fed three whole fruits by the attending male; 17 min later she expelled a single rough-leaved dogwood stone into the nest. The following day the same male twice regurgitated partially-digested fruits while brooding and attempted unsuccessfully to feed these to nestlings, only to swallow the fruits again. On 15 August the attending female fed regurgitated fruit to two nestlings; one nestling was observed to expel a rough-leaved dogwood stone 29 min later. Three 14-day old nestlings fledged later that day.

The regurgitated drupes did not possess the white exocarp diagnostic of ripe *C. drummondii* fruits; this waxy layer might have been digested partially by the adult prior to provisioning. I collected rough-leaved dogwood stones from within and below this nest to confirm plant species identification; the fleshy mesocarp was removed completely from each sample. Most North American vireos regularly

consume fruit as adults (e.g., Nolan and Wooldridge 1962, Williamson 1971, Rybczynski and Riker 1981), but Bell's vireo appears to be more strictly insectivorous, with less than 1% of plant material in its diet during the breeding season (Chapin 1925, Brown 1993). Barlow's (1962) exhaustive observations included only three instances of an adult consuming fruit, specifically a male consuming wild cherries (*Prunus* sp.) in September. I am unaware of records of fruit being delivered to nestling vireos. The extremely late date of the nest where these observations were made (median hatching date for all nests in 1986 was 9 July) coincided with the fruiting phenology of rough-leaved dogwood, possibly allowing use of a typically unavailable nestling food source. Alternatively, provisioning fruit to nestlings might only reflect typical adult dietary preference during this interval of their annual cycle.

My observations of adults feeding on rough-leaved dogwood fruits over a minimum 14-day interval late in the breeding season, as well as feeding nestlings fruit from 4-days post-hatch until fledging, suggested this food resource was likely available to immature and adult Bell's vireo until they left the breeding grounds. The nutritional composition of rough-leaved dogwood fruit might facilitate an increase in lipid stores prior to molt and migration. Skutch (1980) observed preferential foraging for oil-rich arils by Philadelphia vireo (*Vireo philadelphicus*) in Costa Rica prior to northward spring migration. In addition, frugivory might allow emancipation from the continuous foraging pattern typical of strict insectivores. When ripe fruits are abundant and readily accessible, individuals can fill their crops during a short foraging bout, freeing time for parental care duties.

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LITERATURE CITED

- Barlow, J. C. 1962. Natural history of the Bell's vireo, *Vireo bellii* Audubon. University of Kansas Publications 12:241-296.
- Brown, B. T. 1993. Bell's Vireo (*Vireo bellii*). In The birds of North America. No. 35 (A. Poole, P. Stettenheim, and F. Gill, editors). The Academy of Natural Sciences. Philadelphia, Pennsylvania. The American Ornithologists' Union. Washington, District of Columbia.
- Chapin, E. A. 1925. Food habits of the vireos. Bulletin 1355. United States Department of Agriculture. Washington, District of Columbia.

- Farley, G. H. 1987. Comparative breeding strategies of two coexisting passerines: Bell's vireo (*Vireo bellii*) and Bewick's wren (*Thryomanes bewickii*). M.S. Thesis. Kansas State University, Manhattan.
- Nolan Jr., V. 1960. Breeding behavior of the Bell vireo in southern Indiana. *Condor* 62:225-244.
- Nolan Jr., V., and D. P. Wooldridge. 1962. Food habits and feeding behavior of the white-eyed vireo. *Wilson Bulletin* 74:68-73.
- Rybczynski, R., and D. K. Riker. 1981. A temperate species-rich assemblage of migrant frugivorous birds. *Auk* 98:176-179.
- Skutch, A. F. 1980. Arils as food of tropical American birds. *Condor* 82:31-42.
- Williamson, P. 1971. Feeding ecology of the red-eyed vireo (*Vireo olivaceus*) and associated foliage-gleaning birds. *Ecological Monographs* 41:129-152.

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