

THE IMPORTANCE OF VERTEBRATES IN THE DIET OF TANAGERS

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Abstract.—Aborn and Froehlich (1995) considered an attempt of a Summer Tanager (*Piranga rubra*) to eat an anole (*Anolis carolinensis*) at a migratory stopover site to be the first record of a tanager consuming a vertebrate. They hypothesized that eating lizards may reflect dietary plasticity needed by the bird to meet energy demand during migration. I present evidence of several Caribbean species of tanagers feeding on amphibians and reptiles, and I offer possible explanations on why this behavior has been overlooked. The Summer Tanager, as well as other migrants, should be opportunistic in their feeding habits. There are many lizards in the wintering areas used by this tanager and, as do other local species, the bird may simply be taking advantage of this ample food resource. Thus, I believe that the alternate hypothesis proposed by Aborn and Froehlich (i.e., that the tanager was simply responding to the stimulus of a potential food item) is more plausible.

LA IMPORTANCIA DE VERTEBRADOS EN LA DIETA DE PLAÑIDERAS

Sinopsis.—Aborn y Froehlich (1995) consideraron el intento de un individuo de *Piranga rubra*, de comerse un lagarto (*Anolis carolinensis*), el primer informe de un traúpido utilizando como alimento a un vertebrado. La hipótesis principal utilizada para explicar el incidente fue que el alimentarse de lagartos pudiera ser una plasticidad alimentaria necesaria para cumplir con la demanda energética impuesta por la migración. Presento evidencia de varias especies de traúpidos caribeños utilizando como alimentos anfibios y reptiles. Además ofrezco alternativas para explicar el que no se haya observado más amenudo este patrón de conducta. *P. rubra*, al igual que otros migratorios, debe ser oportunista en sus hábitos alimentarios. Hay una gran cantidad de lagartos en las áreas en donde esta ave pasa el invierno, y al igual que otras especies locales, esta plañidera pudiera estar utilizando este recurso tan abundante. Por lo tanto creo que la hipótesis alterna ofrecida por Aborn y Froehlich, ej. de que el ave estaba tan solo respondiendo al estímulo de una presa potencial, es más adecuada.

In a recent article, Aborn and Froehlich (1995) reported a Summer Tanager (*Piranga rubra*) attempting to feed on a green anole (*Anolis carolinensis*). Although the bird was not able to eat the lizard (apparently because of the lizard's size), the authors suggest that this may be the first record of tanagers feeding on vertebrates. The main hypothesis proposed by the authors to explain this incident was that eating lizards may be a form of dietary plasticity needed to meet energy demands during migration. Their observation is not the first record of tanagers eating vertebrates, and I believe that feeding on vertebrates is not a rare behavior in the omnivorous Thraupinae. Aborn and Froehlich (1995) alternate hypothesis (i.e., that the tanager was responding to the stimulus of a potential food item) seems more plausible.

Although Isler and Isler (1987) report tanagers typically feeding on fruits and insects, they also note members of this group feeding on earthworms, snails, millipedes, spiders, and vertebrates such as frogs and small

snakes. Guerrero (1981) observed Black-crowned Palm Tanagers (*Phaenicophilus palmarum*) feeding on *Anolis* lizards in the Dominican Republic. The Puerto Rican Tanager (*Nesospingus speculiferus*) feeds mainly on invertebrates such as insects, spiders, centipides, slugs, and snails (pers. obs.), but this species has been reported feeding on lizards and frogs as well (Wetmore 1916). I also have observed this species at the Carite Forest (see Pérez-Rivera 1994 for description of the forest) feeding on lizards. Biaggi (1973) also reported this tanager feeding on vertebrates such as "sapitos" (small toads). Puerto Rican Tanagers also eat adults, juveniles, and clutches of eggs of *Eleutherodactylus* frogs (pers. obs.). These amphibians are abundant (e.g., 20,570 *E. coqui*/ha in the Luquillo Experimental Forest; Woolbright 1991) in the rainforests of Puerto Rico. At least fourteen other species of birds in Puerto Rico include this ample resource in their diet (Table 1). I also suspect that the Puerto Rican Tanager feeds

TABLE 1. Species of birds in Puerto Rico that include *Eleutherodactylus* frogs in their diet.

Species	Reference
Puerto Rican Broadwinged Hawk (<i>Buteo platypterus brunnescens</i>)	Tossas 1995 pers. obs.
American Kestrel (<i>Falco sparverius</i>)	pers. obs.
Mangrove Cuckoo (<i>Coccyzus minor</i>)	pers. obs.
Puerto Rican Lizard-Cuckoo (<i>Saurothera vieilloti</i>)	pers. obs.
Puerto Rican Screech Owl (<i>Otus nudipes</i>)	pers. obs.
Puerto Rican Woodpecker (<i>Melanerpes portoricensis</i>)	pers. obs.
Puerto Rican Loggerhead Kingbird (<i>Tyrannus caudifasciatus</i>)	Biaggi 1973
Puerto Rican Flycatcher (<i>Myiarchus antillarum</i>)	Wetmore 1996
Red-legged Thrush (<i>Turdus plumbeus</i>)	Wetmore 1916 Rolle 1963 Pérez-Rivera 1979
Pearly-eyed Thrasher (<i>Margarops fuscatus</i>)	Wetmore 1916 Arendt 1980 pers. obs.
Black-whiskered Vireo (<i>Vireo altiloquus</i>)	Wetmore 1996
Adelaide's Warbler (<i>Dendroica adelaidae</i>)	Wetmore 1916
Greater Antillean Grackle (<i>Quiscalus niger</i>)	Wetmore 1996
Puerto Rican Black-cowled Oriole (<i>Icterus dominicensis</i>)	Wetmore 1916 pers. obs.

occasionally on the nestlings of small birds such as the Puerto Rican Emerald Hummingbird (*Chlorostilbon maugaeus*), Black-whiskered Vireo (*Vireo altiloquus*), and the Puerto Rican Vireo (*Vireo latimeri*), which have disappeared from their nests after families of tanagers moved around their nesting location.

Most birds in the Caribbean seem to be opportunistic generalists due to their frequent exposure to major alterations of their habitat and food resources caused by catastrophic events such as hurricanes (Waide 1991, Wiley and Wunderle 1993). For example, the Antillean Euphonia (*Euphonia musica*), considered to be a diet specialist on the fruit of mistletoe (*Phoradendron* spp.), has been observed feeding on the fruits of eight additional species of plants and on arthropods after Hurricane Hugo (Pérez-Rivera 1991). The periodic occurrence of such catastrophic events (e.g., an average of one hurricane every 15 yr for Jamaica; Neumann et al., 1990) probably subjects bird populations to selection favoring generalization of diet and feeding behavior (Pérez-Rivera 1994). Vertebrates, such as lizards, seem to be widely used as food by birds (McLaughlin and Roughgarden 1989, Schoener and Schoener 1978, Wunderle 1981, Waide and Reagan 1983), including tanagers (Table 2). Thus, detailed studies on other species of omnivorous tanagers will probably reveal the consumption of other vertebrates such as frogs and lizards.

The overlooking of amphibians and reptiles in the diet of omnivorous tanagers may be attributed to a variety of factors. First, most tanagers have been poorly studied; the information on their diet has come mainly from general reference books and in many cases is anecdotal. Second, frogs usually hide well during the day and lizards are not easy prey because they can move rapidly. Third, the capture of prey such as frogs and lizards may occur mainly, and/or be facilitated, at particular times of the day such as dusk and dawn. I have found that the percentage of lizards and frogs captured by the Puerto Rican Tanager is significantly higher at dawn ($z = 3.68$; $P < 0.05$) and dusk ($z = 2.19$; $P < 0.05$) than during the rest of the day (7.8 vs 1.2% of total prey taken; $n = 440$). Frogs used as

TABLE 2. Species of tanagers that feed on vertebrates.

Species	Location	Food item	Reference
<i>Rhodinocichla rosea</i>	Panamá	frogs	Isler and Isler 1987
<i>Habia fuscicauda</i>	Panamá	snakes	Isler and Isler 1987
<i>Phoenicopterus palmarum</i>	Dominican Republic	<i>Anolis</i> lizards	Guerrero 1981
<i>Nesospingus speculiferus</i>	Puerto Rico	small toads	Biaggi 1973
		<i>Eleutherodactylus</i> frogs	Wetmore 1916; pers. obs.
		<i>Eleutherodactylus coqui</i>	Wetmore 1916
		<i>Anolis</i> lizards	Wetmore 1916; pers. obs.
		<i>Anolis evermani</i>	pers. obs.
		<i>Anolis krugii</i>	pers. obs.

prey (e.g., *Eleutherodactylus coqui*), are active from dusk to dawn (Stewart 1985). Finally, animal protein seems to be taken more often by tanagers during nesting (e.g., Puerto Rican Tanager and the Stripe-headed Tanager, *Spindalis zena*, pers. obs.). In Trinidad, Snow and Snow (1971) also found seasonality in the proportions of fruit and animal matter taken by tanagers.

The Summer Tanager, as well as other migrants, should be opportunistic in their feeding habits. Nevertheless, I do not believe that eating lizards represents a dietary plasticity of this species needed to meet the energy demands during migration. As described above, tanagers frequently consume vertebrates, and the tanager observed by Aborn and Froehlich (1995) was probably simply taking advantage of a readily available food resource. Thus, I believe that the alternate hypothesis proposed by Aborn and Froehlich (1995), that the bird was simply responding to the stimulus of a potential food item, is more plausible.

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