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## Previously Unknown Food Items in the Diet of Six Neotropical Bird Species

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**ABSTRACT.**—We report new food items for six species of Costa Rican birds. This report includes the first egg predation observed for Hoffman's Woodpecker (*Melanerpes hoffmannii*), the first vertebrate recorded in the diet of Sooty Robin (*Turdus nigrescens*), and records for Groove-billed Ani (*Crotophaga sulcirostris*), Black and White Owl (*Ciccaba nigrolineata*), Blue-crowned Motmot (*Momotus momota*), and Clay-colored Robin (*Turdus grayi*). Received 24 January 2007. Accepted 3 May 2007.

Basic knowledge of the diet of bird species is fundamental to understanding their ecological requirements and designing effective conservation plans for their protection (Kantak 1979, Barrantes and Loiselle 2002). Unfortunately, our understanding of the diets of wild tropical birds is poor. New food items are continuously being added (Chacón-Madrigal and Barrantes 2004, García-C. and Zahawi 2006) to the known diets for even well-studied species, such as motmots (Skutch 1945, 1947, 1964, 1971; Orejuela 1980; Remsen et al. 1993). The results of these studies indicate

that many species have a more varied diet than was previously thought.

Information on the diets of Costa Rican birds was generally and briefly summarized by Stiles and Skutch (1989). We report here additional diet items for five species which have a wide distribution in the Neotropics (Stiles and Skutch 1989, Stotz et al. 1996) and present more information about their diets than has been available (Ibañez et al. 1992, Gerhardt et al. 1994, Eitniear and Aragon-Tapia 2000). One of these species, the Sooty Robin (*Turdus nigrescens*), is endemic in the highlands of Costa Rica and Panamá (Stiles and Skutch 1989, Stotz et al. 1996), and has not had detailed study of its diet. Our specific objective is to provide information on undocumented food items eaten by six species of Costa Rican birds that we recorded over the last 5 years during fieldwork throughout the country.

### SPECIES ACCOUNTS

Groove-billed Ani (*Crotophaga sulcirostris*). We observed an ani holding a Ground-sparrow (*Melospiza* sp.) egg in its bill on 6 July 2005 at Getsemani, Heredia (10° 06' N, 84° 02' W; 1,350 m). The eggshell was whitish with small reddish spots characteristic of the genus (Stiles and Skutch 1989). We earlier

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(1 week) saw a White-eared Ground-sparrow (*M. leucotis*) with nest material in its bill, 50 m from where the ani was first found and it is possible the egg belonged to this species. The ani swallowed the egg contents through a hole in the eggshell. This is the second record of egg predation by the Groove-billed Ani (Eitniear and Aragon-Tapia 2000) and the first for the tropics. The Smooth-billed Ani (*C. ani*) (Alvarez 1975) and the Groove-billed Ani are the only species in the genus that have been observed eating eggs.

Black and White Owl (*Ciccaba nigrolineata*). We observed a Black and White Owl on 6 April 2005 at Altamira Station, La Amistad International Park (9° 01' N, 83° 00' W; 1,382 m), fly to a Cecropia tree (*Cecropia* sp.) at 1745 hrs with a Barn Swallow (*Hirundo rustica*) in its claws where another Black and White Owl was perched. The first owl passed the swallow from its bill to the bill of the second owl in ~2 sec. The second owl ate the swallow in one gulp after biting the neck and head while the swallow was held in its claw. Birds are known to be part of the diet of the Black and White Owl (Ibañez et al. 1992, Gerhardt et al. 1994), but predation on Barn Swallows has been not previously reported. Barn Swallows roosts on cables in open areas during migration (Skutch 1944); this behavior can make it easy prey for nocturnal predators (McIlhenny 1937, LaPorte 1974). Predation of swallows by other species of related neotropical owls has not been reported, although owl predation on birds is not rare (Marks et al. 1999).

Blue-crowned Motmot (*Momotus momota*). We found an individual Blue-crowned Motmot on 24 September 2003 eating a shrew (*Cryptotis* sp.) (estimated length of 6 cm) at Coronado, San José (9° 57' N, 83° 59' W; 1,500 m). The motmot was first seen on the ground in a house garden with the prey in its bill. The motmot repeatedly hit the shrew against the ground for about 5 min and then flew to a higher perch where it swallowed the prey after repeated smashing it for ~2 min. We could see the silhouette of the shrew in the bird's crop after swallowing; the motmot remained motionless for at least 5 min before departing. Several authors report that this species of motmot commonly feeds on small vertebrates such as birds, toads, lizards, and

snakes (Skutch 1983, Stiles and Skutch 1989, Ridgely and Gwynne 1989), but small mammals are taken rarely (Chacón-Madrigal and Barrantes 2004). We suspect the shrew may have been at the upper size limit of prey consumed by this species based on the manner in which the motmot manipulated it.

We observed a Blue-crowned Motmot on 4 March 2004 on the Universidad de Costa Rica Campus, in San José (9° 54' N, 84° 03' W; 1,200 m), eating a portion of wasp nest of about 5 cm in length. The bird struck the wasp nest fragment against the ground in a manner similar to that used for subduing animal prey. It was not possible to identify the content of the nest fragment. The Blue-crowned Motmot is known to consume social insects, such as ants and wasps, as part of its diet (Skutch 1983, Raw 1997, Ridgely and Greenfield 2001), but attacks on wasp nests were previously unknown.

Hoffmann's Woodpecker (*Melanerpes hoffmannii*). We observed an individual Hoffmann's Woodpecker on 9 March 2004 at Coronado, San José (9° 58' N, 83° 59' W; 1,500 m) eating an unidentified bird egg, which was completely white and no longer than 2 cm. The woodpecker flew into a single tree in a semi-open area holding the egg in its bill. After arriving at a perch, the bird climbed the tree to a fork where it placed the egg and began to peck a hole into the egg. The bird then started feeding on the contents by rapidly sticking its tongue in and out of the hole in the egg. Woodpeckers have a worldwide distribution and have previously been observed consuming eggs in four species of *Melanerpes*, two species of *Picus*, the Red-naped Sapsucker (*Sphyrapicus nuchalis*), Great Spotted Woodpecker (*Dendrocopos major*), and Cuban Green Woodpecker (*Xiphidiopicus percussus*) (Bryant 1921, Fajer et al. 1987, Cooper 1992, Winkler and Christie 2002).

Sooty Robin (*Turdus nigrescens*). We saw a Sooty Robin eating a lizard (*Mesaspis monticola*) on 28 May 2001 at Chirripó National Park (9° 27' N, 83° 26' W; 3,600 m). When first observed, the bird was on the ground and had the lizard in its bill, constantly hitting it against the rocky ground surface. The action of hitting the prey on the ground appeared challenging as the robin took five rests during 3 min of observation. The bird placed the liz-

ard on the ground for periods of about 15 sec throughout the resting periods. The robin then walked into the dense vegetation with the lizard and disappeared where it is presumed the prey was consumed. The Sooty Robin inhabits an area in which the lizard *Mesaspis monticola* is abundant (Savage 2002), but has not been previously reported feeding on this lizard. Previous observations indicate that berries and small invertebrates constitute the bulk of the diet of the Sooty Robin (Stiles and Skutch 1989, Clement 2000).

Clay-colored Robin (*Turdus grayi*). We observed a Clay-colored Robin feeding on a house gecko (*Hemidactylus frenatus*) on 31 January 2005 at Golfito, Puntarenas (08° 39' N, 83° 09' W; 5 m) while perched on the lawn in front of the Universidad de Costa Rica student houses. The Clay-colored Robin squashed the gecko's head by repeatedly closing and opening its bill for approximately 40 sec. The bird then moved its head back and with small lateral movements swallowed the gecko. This robin is mainly frugivorous, but lizards and snakes have been documented as constituting a part of its diet (Feduccia 1971, Stiles and Skutch 1989, Clement 2000); however this gecko species has not previously been reported in the diet of the Clay-colored Robin. The house gecko, despite being a recent colonist (Savage 2002), was recently reported as part of the diet of the House Wren (*Troglodytes aedon*) (Barquero and Hilje 2005), indicating this invasive species has become a new food resource for some species.

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