

- MAILLIARD, J. 1900. A neglected point concerning the Picidae. *Condor* 2:13.
- MEARNS, E. A. 1890. Descriptions of a new species and three new subspecies of birds from Arizona. *Auk* 7:243-251.
- PAYNE, R. B. 1972. Mechanisms and control of molt, p. 103-155. In D. S. Farner and J. R. King [eds.] *Avian biology*, Vol. II. Academic Press, New York.
- RIDGWAY, R. 1887. A manual of North American birds. J. B. Lippincott Co. Philadelphia.
- RIDGWAY, R. 1914. The birds of North and Middle America. U. S. Natl. Mus. Bull. 50, Part VI.
- RITTER, W. E. 1938. The California Woodpecker and I. Univ. California Press, Berkeley.
- SWARTH, H. S. 1904. Birds of the Huachuca Mountains, Arizona. *Pacific Coast Avifauna*, No. 4.

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TEMPERATURES OF SOME PUERTO RICAN BIRDS, WITH NOTE OF LOW TEMPERATURES IN TODIES

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I measured cloacal temperatures of 20 species of birds at five localities in Puerto Rico (table 1). Although the altitudes ranged from 100 to 2,100 ft, in most cases I combined data on individuals of a given species, owing to small samples at each locality. Most of the birds showed no wing or tail molt, although some individuals had worn tips on their feathers.

Temperatures of the Puerto Rican Tody (*Todus mexicanus*) were unusually low, being even cooler than that of the Long-tailed Hermit (*Phaethornis superciliosus*), which has a similar weight (38.6°C, 5.6 g; Oniki, *Condor* 74:209, 1972). Todies in the hot scrub at Guanica (d) had higher and more usual

temperatures than those in the cooler forest on the Rio Mameyes (b), except for one Guanica bird measured at 24.9°C in the early morning. McNab (*Condor* 68:47, 1966) reported that small birds have low body temperatures, like those of the relatively few mammals of the same weights. However, the temperature of the tody is below the expected value, which may indicate a low metabolic rate or poor insulation as an adaptation for subsisting on scanty or variable food supplies.

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TABLE 1. Temperatures of some Puerto Rican birds.

Species	Locality ¹	N ²	Cloacal temp. (°C)		Weight (g)	
			Av.	Range	Av.	Range
Ground Dove (<i>Columbina passerina</i>)	d	6	41.4	(38.4-42.4)	35.4	(33.8-39.2)
Ruddy Quail-Dove (<i>Geotrygon montana</i>)	b	2	39.6	(38.2-40.9)	161	
Puerto Rican Emerald (<i>Chlorostilbon maugaeus</i>)	b	—	—	—	2.9	
Puerto Rican Tody (<i>Todus mexicanus</i>)	b	3	36.5	(36.3-36.6)	6.6	(6.0-6.9)
	d	4	38.6	(36.4-39.5)	5.5	(5.0-6.0)
Loggerhead Kingbird (<i>Tyrannus caudifasciatus</i>)	e	2	44.1	(43.8-44.4)	56.3	(54.1-58.5)
Stolid Flycatcher (<i>Myiarchus stolidus</i>)	d	20	42.3	(38.8-43.3)	23.0	(21.0-24.8)
Mockingbird (<i>Mimus polyglottos</i>)	d	1	44.0		45.0	
Pearly-eyed Thrasher (<i>Margarops fuscatus</i>)	c, d	5	41.8	(40.4-42.2)	101.0	(88.8-108.9)
Red-legged Thrush (<i>Mimocichla plumbea</i>)	d	5	42.5	(41.5-42.9)	73.3	(67.0-80.0)
Troupial (<i>Icterus icterus</i>)	d	2	43.6	(43.2-44.0)	73.8	(71.0-76.5)
Puerto Rican Vireo (<i>Vireo latimeri</i>)	d, e	8	41.5	(40.6-42.4)	11.8	(11.0-12.2)
Black-and-White Warbler (<i>Mniotilta varia</i>)	d	6	41.3	(40.2-43.0)	9.5	(8.6-10.0)
Northern Parula (<i>Parula americana</i>)	d	4	41.2	(39.2-42.7)	7.0	(6.2-7.8)
Prairie Warbler (<i>Dendroica discolor</i>)	d	3	40.5	(39.5-41.5)	6.8	(6.5-7.2)
Adelaide's Warbler (<i>Dendroica adelaidae</i>)	d	3	41.3	(40.9-42.0)	6.9	(6.8-6.9)
American Redstart (<i>Setophaga ruticilla</i>)	d	2	39.6	(37.8-41.4)	6.9	
Bananaquit (<i>Coereba flaveola</i>)	b, c, d, e	40	41.4	(38.4-43.9)	9.6	(7.4-12.0)
Puerto Rican Tanager (<i>Nesospingus speculiferus</i>)	a	1	42.0		37.0	
Puerto Rican Bullfinch (<i>Loxigilla portoricensis</i>)	b, d, e	45	42.0	(40.0-43.9)	32.9	(26.0-39.0)
Black-faced Grassquit (<i>Tiaris bicolor</i>)	d, e	11	41.4	(39.5-43.1)	9.4	(8.5-10.5)

¹ Localities, altitude, net-hours (one 12-m net/1 hr), and average ambient temperature as follows: a) La Mina Recreation Camp (18° 18' N, 65° 47' W), 2,100 ft, 21.4 n-h (17 Jan. 1972), 23°C; b) Rio Mameyes (18° 19' N, 65° 45' W), 700 ft, 309 n-h (18 and 19 Jan.), 23°C; c) El Verde (18° 19' N, 65° 49' W), 1,700 ft, 16.5 n-h (21 Jan.), 22°C; d) Guanica (17° 58' N, 66° 52' W), 150 ft, 433 n-h (24 to 27 Jan.), 26°C; and e) La Parguera (17° 59' N, 67° 04' W), 100 ft, 7 n-h (28 Jan.), 26°C.

² Weight and temperature were measured on the same number of birds except for Ruddy Quail-Dove (1 weighed), Puerto Rican Emerald (2 weighed), American Redstart (1 weighed), Puerto Rican Bullfinch (42 weighed), and Black-faced Grassquit (12 weighed).