

GEOGRAPHICAL VARIATION IN THE GRAY KINGBIRD,
TYRANNUS DOMINICENSIS

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THE Gray Kingbird ranges from the coasts of Florida, and less commonly of Georgia and South Carolina, through the West Indies, to the Guianas, Venezuela, and northern Colombia. It is a successful, abundant species. In the United States it is associated very closely with tide-water. In the Greater Antilles it is found from sea level to 5000 feet elevation in the mountains.

In the United States the breeding ranges of *Tyrannus dominicensis* and *Tyrannus tyrannus*, the Eastern Kingbird, are ecologically distinct. The former breeds in mangroves and other bushes or trees in the salt marsh, and the Eastern Kingbird nests inland. On Cuba and the southern Bahamas, both *T. dominicensis* and the much larger *Tyrannus cubensis* occur. The latter is a rather uncommon species with a preference for pine forest, whereas *dominicensis* inhabits open or cultivated land. On Grenada and Margarita Island, *Tyrannus melancholicus despotus* occurs with the Gray Kingbird. It is not known whether there are any ecological differences between these two species.

The Gray Kingbird is migratory in the United States, the Bahamas, Cuba, and Jamaica, occurring normally in those places from March or April to September. In Central America it appears only on migration. In northern South America, except for one apparent breeding record, it is found only in winter, from September to April or early May. In Hispaniola, Porto Rico, the Virgin Islands, the Lesser Antilles, and certain islands off the north coast of South America, it is resident throughout the year. Trinidad and the Guianas are visited during the winter by some of the Lesser Antillean population.

Males of the Gray Kingbird have more attenuated primaries than females (Fig. 1). Young birds have rounded tips on the primaries and lack the orange or yellow crown-patch of maturity. As with many other members of the Tyrannidae, the migratory races of this bird begin the molt of body feathers on the breeding grounds but do not replace the worn remiges and rectrices until after they reach winter quarters. The orange crown-patch begins to appear on young birds in August or September and is complete by December. The molt of the primaries is a slow process. In the migratory races the innermost ones are shed in September or October, and both young and old complete the molt of the primaries about the middle of March,

before migrating northward. The molt of the rectrices begins with the middle pair. Two adults from the Bahamas, taken July 4 and August 5, have already commenced the tail molt, but ordinarily the molt of the rectrices in the migratory races coincides with the molt of the primaries.

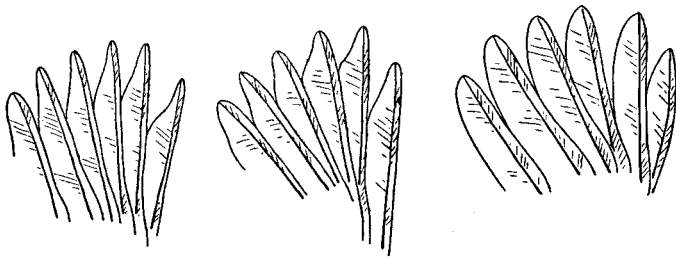


FIGURE 1. Outer primaries of *Tyrannus dominicensis fugax*, Cedar Key, Florida.—*Left*, Adult male, No. 15743; *Center*, Adult female, No. 15748; *Right*, Juvenile female, No. 15477.

In the sedentary races the molt of the wings and tail is even more protracted than in the migratory forms. In December, birds which were hatched the previous summer still retain the outer rectrices and four or five outer primaries of the juvenal plumage. One or two outer juvenal primaries are frequently retained until the end of June or even until late in August. Such yearling birds breed while still partly in juvenal plumage. Their wings and tails are shorter than those of fully adult birds, and they have, therefore, been excluded from my tables of measurements.

During the present study 1104 specimens were assembled, as follows: Chicago Natural History Museum, 408; United States National Museum, including the Biological Survey Collection, 311; American Museum of Natural History, 187; Museum of Comparative Zoology, 89; Carnegie Museum, 72; Academy of Natural Sciences of Philadelphia, 14; University of California, 12; my own collection, 12; University of Florida, 3; collection of J. C. Dickinson, Jr., 1. To the curators in charge of the above collections I am grateful for allowing me to use their material. The drawings of the primaries were made by Miss Esther Coogle.

Diagnoses are given below of the five subspecies which it is proposed to recognize. Attention is called to the relationship of the tail to wing index to migratory habits. Those races which are migratory have relatively longer wings and shorter tails than do the sedentary races.

***Tyrannus dominicensis fugax*, new subspecies**

TYPE: Collection of Pierce Brodkorb, No. 15743; adult male; Cedar Key, Levy County, Florida; April 30, 1949; P. Brodkorb, collector.

CHARACTERS: Agrees in coloration with *Tyrannus d. dominicensis* (Gmelin), but differs in having a lower tail to wing ratio; the wing is relatively and absolutely longer, and the tail is relatively and absolutely shorter (Table 1). In addition, the culmen, tarsus, and middle toe average longer, and the wing tip and the emargination of the tail average shorter.

TABLE 1
Tyrannus dominicensis fugax, MEASUREMENTS IN MILLIMETERS
AND RATIOS IN PERCENTAGES

	Number specimens	Mean	Standard error of mean	Standard deviation	Mean \pm standard deviation	Observed range
<i>Males</i>						
Wing length	115	121.0	.19	2.01	119.01-123.03	116.0-127.0
Tail length	114	92.8	.21	2.25	90.51-95.01	87.5-97.5
Culmen length	115	30.3	.10	1.04	29.22-31.30	27.0-34.0
Bill width	115	11.6	.04	0.48	11.09-12.05	10.5-13.0
Tarsus length	117	18.6	.05	0.58	18.00-19.16	17.0-19.7
Middle toe length	117	14.4	.05	0.56	13.82-14.94	13.2-16.0
Wing tip length	115	9.5	.11	1.17	8.34-10.68	7.0-13.8
Tail emargination	115	9.9	.19	2.03	7.85-11.91	5.5-15.5
Tail: wing ratio	114	76.7	.13	1.43	75.25-78.11	72.7-80.3
Culmen: wing ratio	112	25.0	.08	0.86	24.13-25.85	22.7-26.6
Bill width: culmen ratio	114	38.2	.14	1.49	36.72-39.70	34.9-41.4
<i>Females</i>						
Wing length	85	117.1	.12	1.09	116.07-118.25	113.0-119.5
Tail length	83	88.3	.22	2.04	86.29-90.37	83.3-93.0
Culmen length	83	29.9	.11	1.00	28.89-30.89	26.5-32.0
Bill width	85	11.8	.05	0.50	11.25-12.25	10.5-13.1
Tarsus length	86	18.9	.09	0.80	18.09-19.69	15.5-20.8
Middle toe length	86	14.4	.07	0.61	13.75-14.97	13.5-16.0
Wing tip length	85	9.5	.12	1.10	8.43-10.63	7.5-13.5
Tail emargination	76	8.2	.19	1.58	6.59-9.75	5.0-11.5
Tail: wing ratio	83	75.3	.16	1.47	73.82-76.76	70.8-78.5
Culmen: wing ratio	82	25.5	.09	0.83	24.69-26.35	23.1-27.3
Bill width: culmen ratio	82	39.4	.20	1.84	37.52-41.20	34.4-44.4

Differs from *Tyrannus d. vorax* Vieillot in having the upper parts paler gray, the bill narrower and less swollen, and the tail to wing and culmen to wing ratios lower. The wing averages longer, and the tail, culmen, tarsus, and middle toe average shorter.

RANGE: Breeds at tidewater along the coast of southeastern United States, from Charleston, South Carolina, to Pensacola, Florida, and in the Bahamas, except on Green Cay and Southern Ragged

Island. Winters occasionally in the interior of Florida (Madison, February 11, 1889; Lakeport, January 30-31, 1945), Hispaniola (Tortue Island, Haiti, February 4, 1917; Port au Prince, Haiti, December 24, 1927; Maiman, Dominican Republic, January 31, 1895; Saona Island, Dominican Republic, April 8, 1934), and the Virgin

TABLE 2
AVERAGE MEASUREMENTS AND PROPORTIONS OF *Tyrannus dominicensis fugax**

Locality	Wing	Tail	Culmen	Tail: wing ratio
<i>Males</i>				
United States	120.2 (39)	91.9 (39)	30.2 (40)	76.5 (39)
Bahamas	121.4 (76)	93.2 (75)	30.3 (75)	76.8 (75)
<i>Females</i>				
United States	116.8 (34)	87.7 (33)	29.7 (34)	75.1 (33)
Bahamas	117.4 (51)	88.7 (50)	30.1 (49)	75.4 (50)

* Numbers in parentheses indicate number specimens measured.

Islands (St. Croix, January 19, 1890). Occurs on migration at Grand Cayman (August 17, 1886), Little Cayman (September 10, 1886), and Aruba (May 1, 1908). It winters in northern Venezuela (Caicara, March 31, 1898; road from Colonia Tovar to El Limón, November 10, 1937) and northern Colombia (Varrud, November 5, 1914; Tucacas, October 23, 1918).

COMMENT: A specimen taken in Hillsborough County, Florida, on June 9, 1900, has one white upper tail-covert. Birds from the Bahamas average slightly larger than those from the United States (Table 2).

SPECIMENS EXAMINED: SOUTH CAROLINA: Charleston, 1 (April 30, 1840). GEORGIA: St. Simon Island, 1 (September 1, 1859). FLORIDA: Escambia Co. (Pensacola, 2); Franklin Co. (St. George Island, 1); Wakulla Co. (St. Marks lighthouse, 4); Madison Co. (Madison, 1); Levy County (Cedar Key, 9); Pasco Co. (Anclote Keys, 4); Pinellas Co. (near Seven Oaks, 7; Passage Key, 1; Indian Pass, 1); Hillsborough Co., 1; Manatee Co. (Anna Maria Key, 1); Sarasota Co. (Sarasota, 1); Charlotte Co. (Charlotte Harbor, 1); Lee Co. (Punta Rassa, 1; Caxambas, 1); Collier Co. (Indian Key, 1); Monroe Co. (Cape Sable, 1; Key Largo, 2; Big Pine Key, 2; Cudjoe Key, 1; No Name Key, 2; Nameless Keys, 1; Bamboo Key, 1; Key West, 4; "Keys," 1); Glades Co. (Lakeport, 1); St. Johns Co. (Matanzas, 1; Fort Matanzas, 2; Matanzas Inlet, 5); Volusia Co. (Oak Hill, 5; New Smyrna, 1); Dade Co. (Miami Beach, 1); not further specified, 6.

BAHAMAS: Grand Bahama, 7; Abaco, 17; Green Turtle Cay, 1; Eleuthera, 3; New Providence, 8; Hog Island, 1; Andros, 6; Long Island, 1; Crooked Island, 1; Fortune Island, 1; Acklin Island, 7; Castle Island, 1; Plana Cay, 2; Mariguana, 6; West Caicos, 1; Providenciales, 1; East Caicos, 2; Pine Cay, 1; Grand Turk, 2; Little Inagua, 4; Inagua, 78; Johnsons Cay, 1; Little Golden Key, 1; Bimini, 2 (atypical); Watlings Island, 1 (atypical).

GRAND CAYMAN, 1. LITTLE CAYMAN, 2. HAITI (Tortue Island, 1; Port au Prince 1). DOMINICAN REPUBLIC (Maiman, 1; Saone Island, 1). St. Croix, 1. Aruba, 3. VENEZUELA (Guiribana de Caicara, 1; road from Colonia Tovar to El Limón, 1). COLOMBIA (Varrud, 1; Tucacas, 1). No locality specified, 2. Total, 249.

***Tyrannus dominicensis sequax*, new subspecies**

TYPE: United States National Museum, No. 172802; adult male; Nueva Gerona, Isle of Pines; July 10, 1900; William Palmer and J. H. Riley, original number 661.

CHARACTERS: Agrees with *T. d. fugax* in color and proportions, but smaller throughout (Table 3); weight less (43 grams in one female; two males and two females of *fugax* weighed 51.0–51.8 and 51.6–66.1 grams, respectively).

Agrees with *T. d. dominicensis* in color, but differs in having the tail shorter and the tail to wing index lower.

TABLE 3
Tyrannus dominicensis sequax, MEASUREMENTS IN MILLIMETERS
AND RATIOS IN PERCENTAGES

	Number specimens	Mean	Standard error of mean	Standard deviation	Mean \pm standard deviation	Observed range
<i>Males</i>						
Wing length	33	115.6	.28	1.60	113.95–117.15	112.0–118.0
Tail length	30	88.6	.36	1.95	86.62–90.52	85.5–94.5
Culmen length	33	28.5	.17	0.98	27.56–29.52	26.5–30.2
Bill width	33	11.1	.08	0.45	10.61–11.51	10.0–12.0
Tarsus length	33	18.2	.09	0.50	17.66–18.66	17.0–19.2
Middle toe length	33	14.0	.11	0.64	13.36–14.64	12.5–15.2
Wing tip length	33	8.9	.20	1.15	7.73–10.03	7.0–11.5
Tail emargination	30	9.2	.22	1.19	8.03–10.41	6.5–11.5
Tail: wing ratio	30	76.6	.26	1.40	75.17–77.97	74.7–80.1
Culmen: wing ratio	33	24.7	.15	0.87	23.86–25.60	22.8–26.1
Bill width: culmen ratio	33	38.8	.33	1.92	36.83–40.67	35.4–42.9
<i>Females</i>						
Wing length	24	111.8	.44	2.15	109.66–113.96	107.0–116.0
Tail length	24	83.7	.54	2.66	81.03–86.35	80.0–88.2
Culmen length	25	28.0	.17	0.84	27.20–28.88	26.5–30.0
Bill width	25	11.1	.11	0.53	10.53–11.59	10.0–12.2
Tarsus length	25	18.8	.10	0.52	18.32–19.36	18.0–19.5
Middle toe length	25	14.1	.12	0.58	13.51–14.67	12.5–15.0
Wing tip length	25	9.1	.28	1.42	7.63–10.47	6.0–12.5
Tail emargination	23	7.7	.31	1.49	6.16–9.14	5.5–11.5
Tail: wing ratio	24	74.9	.33	1.60	73.26–76.46	72.1–77.9
Culmen: wing ratio	24	25.1	.21	1.02	24.11–26.15	23.3–27.2
Bill width: culmen ratio	25	39.6	.43	2.15	37.48–41.78	34.7–44.8

Differs from *T. d. vorax* in having the upper parts paler gray; the tail, culmen, width of bill, and tarsus smaller; the tail to wing and

culmen to wing ratios lower; and the wing, middle toe, wing tip, and emargination of the tail averaging shorter.

TABLE 4
AVERAGE MEASUREMENTS AND PROPORTIONS OF *Tyrannus d. sequax*
AND *Tyrannus d. dominicensis* IN THE GREATER ANTILLES

Locality	Wing	Tail	Culmen	Tail: wing ratio
<i>Males</i>				
Cuba	115.1 (13)	89.0 (10)	28.5 (13)	77.4 (10)
Isle of Pines	115.9 (8)	88.1 (8)	28.9 (8)	76.0 (8)
Caymans	115.8 (12)	88.3 (12)	28.3 (12)	76.3 (12)
Jamaica	118.5 (2)	91.8 (2)	29.8 (2)	77.4 (2)
Hispaniola	115.9 (62)	93.0 (59)	28.2 (60)	80.2 (59)
Porto Rico	117.3 (46)	96.6 (47)	28.8 (66)	82.4 (47)
Virgin Islands	118.9 (57)	97.2 (56)	28.9 (59)	81.7 (55)
<i>Females</i>				
Cuba	111.1 (13)	83.0 (13)	28.2 (14)	74.7 (13)
Isle of Pines	112.0 (4)	83.0 (4)	27.8 (4)	74.1 (4)
Caymans	113.0 (7)	85.3 (7)	27.9 (7)	75.6 (7)
Jamaica	114.4 (4)	86.4 (4)	29.3 (3)	75.5 (4)
Hispaniola	112.3 (56)	88.8 (53)	28.3 (58)	78.9 (53)
Porto Rico	113.2 (58)	90.8 (57)	28.4 (60)	80.3 (55)
Virgin Islands	114.4 (46)	91.5 (46)	29.0 (50)	79.8 (43)

RANGE: Breeds on Cuba, the Isle of Pines, and the Cayman group, and probably on Green Cay (April 13, 1886) and Southern Ragged Island (April 5, 1907) in the southern Bahamas. Occurs on migration on the Dry Tortugas (April 24 and 30, May 1 and 2, 1890) (it will be noted that *sequax* was collected at Key West during the same month and year; according to Alexander Sprunt (in corres.) the Gray Kingbird does not breed on the Dry Tortugas but is common on migration); at Key West, Florida (May 9, 1890); at Greytown, Nicaragua (March 23, 1892); at Colon (March 12 and 17, 1908), Perme (October 22, 1929), and Obaldia (September 21, 1930), Panama. Occasional in winter on Cuba, the Isle of Pines, and Anegada, Virgin Islands (December 29 and 30, 1889). Winters commonly in Venezuela and northern Colombia.

COMMENT: Birds from Jamaica are tentatively referred here, but the number of Jamaican specimens is inadequate. The data in table 4 illustrate the differences in size of *sequax* and *dominicensis* in the various Greater Antilles.

Sitta curvirostris Hermann (Tab. Aff. Anim., 1783: 204) has been suggested by Stresemann (Nov. Zool., 27: 329, 1920) as an earlier name for the Gray Kingbird. This name was based on Sloane's "Loggerhead" from Jamaica. Hellmayr (Cat. Birds Americas, 5: 111, 1927) considers Hermann's name unidentifiable. I have not been able to

consult either Sloane or Hermann in this connection, but I should like to point out that the vernacular name "loggerhead" is applied in the West Indies to *Tolmarchus caudifasciatus*, whereas *Tyrannus dominicensis* is called "pipiri" or "titiri." These two species are so similar superficially that specimens of *Tolmarchus* were sent to me from several museums when I asked for *Tyrannus*. If Hermann's name should prove identifiable, it may turn out to be an earlier name for *Tolmarchus caudifasciatus jamaicensis* (Chapman).

Three specimens collected by Cherrie in Venezuela form the only basis for believing the Gray Kingbird breeds on the mainland of South America. A pair was collected at Agua Salada de Ciudad Bolivar on April 13, 1907. This date is well within the normal stay of wintering *sequax* in South America, and the two specimens fall within the normal range in size for that race, although they are perhaps a trifle paler than most. The third specimen is an apparently full-grown, juvenile male, taken at Las Barrancas in the Orinoco delta on August 3, 1907. This young bird is also pale but otherwise resembles *sequax*. Whether there is actually a breeding colony on the Orinoco and what its subspecific status may be must await further field work.

SPECIMENS EXAMINED: CUBA, 34. ISLE OF PINES, 13. GRAND CAYMAN, 9. LITTLE CAYMAN, 2. CAYMAN BRAC, 8. JAMAICA, 10. DRY TORTUGAS, 5. BAHAMAS: Southern Ragged Island, 1; Green Cay, 2. VIRGIN ISLANDS: Anegada, 2. FLORIDA: Key West, 1. NICARAGUA: Greytown, 2. PANAMA: Colon, 3; Perme, 1; Obaldía, 1. VENEZUELA: Zulia (Encontrados, 6, November 27-28, February 10-18); Falcón (Tucacas, 2, October 21); Lara (Barquisimeto, 1, November 12); Guárico (El Sombrero, 1, November 18); Aragua (Ocumare de la Costa, 1, October 30); Bolívar (Agua Salada, 2, April 13); Monagua (Las Barrancas, 1, August 3); Valeria, 1, March 11; Río Aurare, 1, January 23; Paraguana, 1, February 5; Colonia Tovar, 1, November 15. COLOMBIA: Magdalena (Trojas de Cataca, 1, October 13; Bonda, 3, September 20, October 14, March 24; Fundación, 1, October 11; Punto Caiman, 1, October 2; Buritaca, 1, September 19; Remolino, 1, January 25; Tucurínca, 1, September 21; Mamatoco, 2, April 21; Santa Marta, 2, February 8; Riohacha, 2, May 7); Atlántico (near Aguada de Pablo, 1, February); Bolívar (Cartagena, 1; Calamar, 1, January 2); Huila (Villavieja, 1, February 4); Antioquia, 1; Tolima (Honda, 2, December 20, January 27); Chocó (Noanamá, 2, December 29, January 1). No locality specified, 2. Total, 138.

TYRANNUS DOMINICENSIS DOMINICENSIS (Gmelin)

Lanius tyrannus β *dominicensis* Gmelin, Syst. Nat., ed. 13, (1): 302, 1788 (Santo Domingo, based on Brisson).

Tyrannus griseus Vieillot, Hist. Nat. Ois. Amér. Sept., 1: 76, pl. 46, 1807 (Santo Domingo).

Tyrannus matulinus Vieillot, Nouv. Dict. Hist. Nat., ed. 2, 35: 82, 1819 (Santo Domingo).

Tyrannus titiri Temminck, Tabl. Méth. Pl. Col., Jan., 1839; 24 (Santo Domingo, young).

CHARACTERS: Differs from *T. d. fugax* and *T. d. sequax* as diagnosed above. Differs from *T. d. vorax* in having the upper parts paler gray, the bill shorter and less swollen, and the culmen to wing ratio lower (Table 5). In addition, the tarsus and middle toe average shorter.

TABLE 5
Tyrannus dominicensis dominicensis, MEASUREMENTS IN MILLIMETERS
AND RATIOS IN PERCENTAGES

	Number of specimens	Mean	Standard error of mean	Standard deviation	Mean \pm standard deviation	Observed range
<i>Males</i>						
Wing length	182	117.3	.18	2.37	114.96-119.70	110.0-124.5
Tail length	174	95.5	.24	3.21	92.29-98.71	81.0-103.0
Culmen length	185	28.6	.08	1.11	27.53-29.75	26.0-32.2
Bill width	187	11.1	.04	0.49	10.57-11.55	9.5-12.2
Tarsus length	188	18.3	.05	0.64	17.65-18.93	16.1-19.5
Middle toe length	187	14.1	.05	0.70	13.42-14.82	12.5-16.0
Wing tip length	168	9.8	.10	1.35	8.43-11.13	7.0-13.0
Tail emargination	161	11.4	.17	2.20	9.23-13.63	6.0-17.0
Tail: wing ratio	173	81.3	.16	2.13	79.19-83.45	73.6-87.4
Culmen: wing ratio	179	24.4	.06	0.89	23.54-25.32	21.8-27.4
Bill width: culmen ratio	184	38.5	.14	1.88	36.62-40.38	34.5-43.6
<i>Females</i>						
Wing length	160	113.3	.17	2.10	111.15-115.35	106.0-119.0
Tail length	156	90.3	.23	2.93	87.37-93.23	82.5-98.0
Culmen length	168	28.6	.08	1.01	27.56-29.58	25.5-30.5
Bill width	167	11.4	.03	0.45	10.91-11.81	10.2-12.5
Tarsus length	169	18.7	.05	0.65	18.04-19.34	16.5-20.8
Middle toe length	169	14.3	.05	0.68	13.60-14.96	12.8-16.0
Wing tip length	153	9.7	.09	1.17	8.55-10.89	7.5-12.5
Tail emargination	140	9.4	.17	2.01	7.40-11.42	4.5-14.5
Tail: wing ratio	151	79.7	.15	1.89	77.79-81.57	74.3-85.3
Culmen: wing ratio	157	25.3	.07	0.82	24.43-26.07	22.8-27.1
Bill width: culmen ratio	167	39.8	.12	1.60	38.19-41.39	35.6-43.9

RANGE: Permanent resident in the Greater Antilles (Hispaniola and outlying islands, Mona, Porto Rico, Vieques, Culebra, and the Virgin Islands) and the northernmost Lesser Antilles (Anguilla, St. Martin, St. Barthelemy, St. Eustatius, St. Kitts, and Nevis).

COMMENT: Although Hispaniola is the type locality for all of the names which have been applied to this race, birds from that island are less well differentiated than those from Porto Rico and the Virgin Islands (Table 4).

An adult male from Beata Island, Dominican Republic, collected by Wetmore and Lincoln on May 11, 1931, is abnormally small and has a remarkably short tail. It has the following measurements: wing, 110; tail, 81; culmen, 27.5; width of bill at nostrils, 11; tarsus, 17.5; middle

toe, 13.8; wing-tip, 7.5; emargination of tail, 6.8 mm.; tail to wing ratio, 73.64; culmen to wing, 25.00; and width of bill to culmen, 40.0 per cent. Four other males from Beata, however, taken in February and April, the latter with enlarged testes, have: wing, 114.5–120.5; tail, 93.5–98 mm.; and tail to wing index, 80.51–81.93 per cent. The May bird, therefore, seems to represent an abnormal condition rather than a trend toward differentiation.

SPECIMENS EXAMINED: HAITI, 27. GRAND CAYEMITES, 1. LITTLE CAYEMITES, 3. GONAVE, 6. PETITE GONAVE, 3. ILE A VACHE, 2. TORTUE ISLAND, 6. DOMINICAN REPUBLIC, 90. BEATA, 5. MONA, 10. PORTO RICO, 119. CULEBRA, 9. VIEQUES, 19. ST. THOMAS, 25. ST. JOHNS, 1, TORTOLA, 10. VIRGIN GORDA, 36. ANEGADA, 22. SALT ISLAND, 1. BEEF ISLAND, 1. ST. CROIX, 30. ANGUILLA, 3. ST. MARTIN, 5. ST. BARTHELEMY, 1. ST. EUSTATIUS, 7. ST. KITTS, 7. NEVIS, 4. Total, 453.

TYRANNUS DOMINICENSIS VORAX Vieillot

Tyrannus vorax Vieillot, Nouv. Dict. Hist. Nat., ed. 2, 35: 90, 1819 (Martinique).

Tyrannus rostratus Sclater, Ibis, 6: 87, footnote, January, 1864 (locality of the type unrecorded).

CHARACTERS: The differences between this and the previously treated races have already been mentioned. The principal characters are the dark gray upper parts, the large, heavy bill, and the high tail to wing ratio (Table 6). In addition, the upper tail-coverts seem more often to have rusty colored tips than is the case with the other races.

RANGE: Resident in the Lesser Antilles from Barbuda, Antigua, and Montserrat, south to Grenada. In winter occurs also on Trinidad and in French, Dutch, and British Guiana. One undated specimen from St. Eustatius has been examined; other skins from that island are of *dominicensis*.

COMMENT: The type of *Tyrannus rostratus* is without recorded locality; the paratype is from Trinidad. Several different authors have conjectured as to the place of origin of the type. Since, according to Sclater, it is of the "make" of Cayenne trade skins, and since the present race is now known to winter in that colony, I restrict the type locality to Cayenne, French Guiana.

Richardson noted the color of the iris of two specimens from Guadeloupe as being yellow. Young and adults from Dominica, St. Lucia, and St. Vincent have the iris recorded by various collectors, including Richardson, as brown in 11 cases, and once each as dark brown, light brown, light reddish brown, or hazel. In all the other races of this species the iris is brown.

Specimens from Barbados, Grenada, and the Grenadines are smaller than those from more northern islands, but the series available is inadequate to demonstrate this conclusively (Table 7).

TABLE 6
Tyrannus dominicensis vorax, MEASUREMENTS IN MILLIMETERS AND
RATIOS IN PERCENTAGES

	Number of specimens	Mean	Standard error of mean	Standard deviation	Mean \pm standard deviation	Observed range
<i>Males</i>						
Wing length	55	119.0	.30	2.22	116.76-121.20	113.3-123.5
Tail length	52	95.3	.33	2.41	92.91- 97.33	89.5-100.0
Culmen length	59	32.1	.16	1.24	30.88- 33.36	29.0- 35.0
Bill width	60	12.9	.08	0.59	12.35- 13.53	12.0- 14.2
Tarsus length	60	19.4	.08	0.60	18.79- 19.99	18.2- 20.5
Middle toe length	60	14.9	.10	0.78	14.09- 15.65	13.5- 16.5
Wing tip length	52	10.1	.14	1.02	9.10- 11.14	7.0- 12.5
Tail emargination	52	9.6	.20	1.43	8.20- 11.06	6.5- 12.5
Tail: wing ratio	50	80.0	.19	1.35	78.61- 81.31	76.8- 83.3
Culmen: wing ratio	54	27.1	.13	0.96	26.09- 28.01	24.2- 29.4
Bill width: culmen ratio	59	40.4	.22	1.67	38.70- 42.04	37.5- 45.0
<i>Females</i>						
Wing length	53	115.5	.27	1.93	113.61-117.27	111.5-119.0
Tail length	53	90.3	.34	2.48	87.82- 92.78	84.5- 95.5
Culmen length	59	31.7	.13	1.00	30.67- 32.67	29.0- 33.5
Bill width	59	13.3	.07	0.51	12.75- 13.77	12.0- 14.2
Tarsus length	59	19.5	.10	0.74	18.72- 20.20	17.5- 21.0
Middle toe length	58	14.6	.10	0.76	13.81- 15.33	12.5- 16.0
Wing tip length	52	10.2	.16	1.17	9.05- 11.39	8.0- 14.5
Tail emargination	43	7.4	.27	1.75	5.66- 9.16	4.5- 11.5
Tail: wing ratio	50	78.3	.19	1.34	76.92- 79.60	75.1- 82.3
Culmen: wing ratio	53	27.5	.12	0.87	26.59- 28.33	27.8- 30.0
Bill width: culmen ratio	59	41.9	.21	1.58	40.32- 43.38	37.5- 45.5

TABLE 7
AVERAGE MEASUREMENTS OF ADULT MALES OF *Tyrannus dominicensis vorax*

Locality	Number of specimens	Wing	Tail	Culmen	Tail to wing ratio
Barbuda	3	121.0	97.8	32.1	80.8
Antigua	17	119.9	94.9	31.4	79.4
Guadeloupe	5	119.8	96.2	31.8	80.1
Dominica	8	120.0	96.3	32.9	80.1
Martinique	3	121.5	97.8	33.4	80.1
St. Lucia	11	120.2	95.4	32.6	79.4
St. Vincent	7	119.1	96.6	31.5	81.2
Barbados	4	117.5	95.5	31.3	80.9
Grenadines	13	116.9	93.4	31.7	79.7
Grenada	7	118.3	94.9	32.0	80.2

SPECIMENS EXAMINED: ST. EUSTATIUS, 1. MONTSERRAT, 2. BARBUDA, 13. ANTIGUA, 33. GUADELOUPE, 14. DESIRADE, 1. MARIE GALANTE, 1. DOMINICA, 24. MARTINIQUE, 5. ST. LUCIA, 30. ST. VINCENT, 20. BARBADOS, 12. BEQUIA, 7. MUSTIQUE, 4. CANNOUNAN, 1. MAYREAU, 2. UNION, 7. PETITE MARTINIQUE, 1.

CARRIACOU, 7. GRENADA, 17. TRINIDAD: Laventille, 1 (December 15); Seelet, 1 (April 7). BRITISH GUIANA: Buxton, 1 (December 25); unspecified, 1. DUTCH GUIANA: Paramaribo, 3 (December 11 and 21, January 19). FRENCH GUIANA: Cayenne, 4 (October 16, November 18, January 8 and 17); Mana, 2 (September 10, October 30). Total, 215.

Tyrannus dominicensis tenax, new subspecies

TYPE: United States National Museum, No. 151714; adult male; Margarita Island, Venezuela; July 7, 1895; Wirt Robinson, collector; original number 453.

CHARACTERS: It is the smallest race of the species (Table 8). Differs from *T. d. fugax* in having the wing shorter and the tail to wing ratio higher; the tail averages longer, and the bill averages shorter,

TABLE 8
Tyrannus dominicensis tenax, MEASUREMENTS IN MILLIMETERS AND RATIOS IN PERCENTAGES

	Number of specimens	Mean	Standard error of mean	Standard deviation	Mean \pm standard deviation	Observed range
<i>Males</i>						
Wing length	13	113.4	.41	1.48	111.94-114.90	110.0-115.0
Tail length	13	93.7	.72	2.59	91.10-96.28	88.0-98.0
Culmen length	11	29.2	.21	0.70	28.47-29.87	27.8-30.2
Bill width	13	11.4	.13	0.46	10.94-11.86	10.5-12.2
Tarsus length	13	18.4	.11	0.41	17.95-18.77	17.5-19.5
Middle toe length	13	13.5	.26	0.95	12.53-14.43	12.5-15.0
Wing tip length	13	18.0	.35	1.28	8.70-11.26	8.0-12.5
Tail emargination	10	10.1	.93	2.93	7.17-13.03	6.0-15.5
Tail: wing ratio	13	82.6	.42	1.50	81.09-84.09	80.0-85.6
Culmen: wing ratio	11	25.8	.21	0.69	25.07-26.45	24.6-26.7
Bill width: culmen ratio	11	39.1	.62	2.05	37.03-41.13	36.1-43.9
<i>Females</i>						
Wing length	10	111.1	.43	1.37	109.68-112.42	109.0-113.0
Tail length	9	91.2	.30	0.90	90.34-92.14	89.5-93.0
Culmen length	10	29.3	.24	0.75	28.55-30.05	28.0-31.0
Bill width	10	12.1	.11	0.35	11.73-12.43	11.5-12.5
Tarsus length	10	19.1	.12	0.37	18.71-19.45	18.5-19.5
Middle toe length	10	13.8	.12	0.37	13.39-14.13	12.8-14.5
Wing tip length	10	9.4	.31	0.98	8.42-10.28	7.5-11.0
Tail emargination	9	8.6	.31	1.54	7.04-10.12	5.5-11.5
Tail: wing ratio	9	82.0	.32	0.96	81.04-82.96	80.5-83.4
Culmen: wing ratio	10	26.4	.26	0.83	25.56-27.22	25.0-28.3
Bill width: culmen ratio	10	41.3	.55	1.75	39.50-43.00	39.0-43.4

Differs from *T. d. sequax* in having the tail longer and the tail to wing ratio higher; the wing averages shorter and the bill longer.

Differs from *T. d. dominicensis* in its shorter wing. In addition, the bill averages larger, and the tail to wing and culmen to wing ratios average higher.

Differs from *T. d. vorax* in having the upper parts paler gray, the wing, bill, and tarsus smaller, the tail to wing ratio higher, and the culmen to wing ratio lower.

RANGE: Resident on Margarita, Curaçao, and Bonaire islands.

TABLE 9
AVERAGE MEASUREMENTS AND PROPORTIONS OF *Tyrannus dominicensis tenax*

Locality	Number of specimens	Wing	Tail	Culmen	Tail to wing ratio
<i>Males</i>					
Margarita	3	112.7	92.0	28.8	81.7
Curaçao	10	113.7	94.2	29.3	82.9
Bonaire	5	116.4	99.0	29.4	83.5
<i>Females</i>					
Margarita	3	111.3	92.0	29.3	81.8
Curaçao	7	110.9	91.0	29.2	82.1
Bonaire	2	109.8	88.5	29.0	80.7

COMMENT: Possibly more than one population may be involved on the three islands mentioned above (Table 9). Birds from Bonaire have been excluded from the measurements of this race given in Table 8.

SPECIMENS EXAMINED: MARGARITA ISLAND, 6 (January, February, March, July). CURAÇAO, 21 (March, April, May, June, July). BONAIRE, 7 (May, July). Total, 34.

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