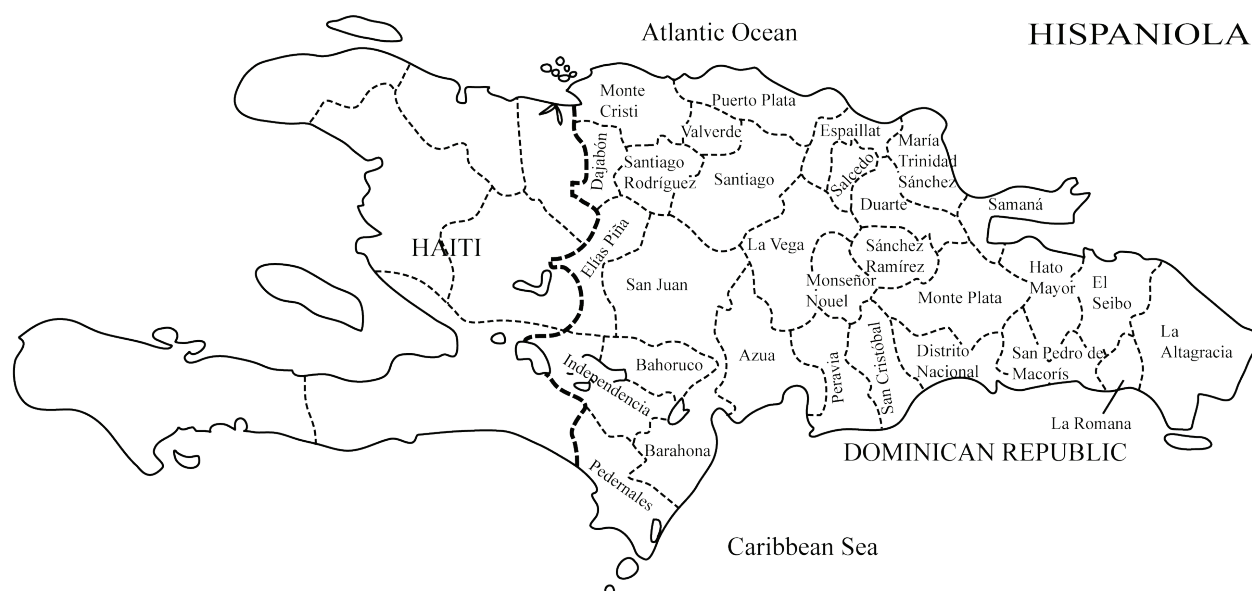


BULLETIN OF AMERICAN ODONATOLOGY



Distribution of the Odonata of the Dominican Republic

Oliver S. Flint, Jr., Ruth H. Bastardo, and
Daniel E. Perez-Gelabert, pp. 67–84

Hind Wing Fragments Of *Meganeuropsis* (Protodonata: Meganeuridae) from the Lower Permian of Noble County, Oklahoma

Roy J. Beckemeyer, pp. 85–89

The Dragonfly Society Of The Americas

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Distribution of the Odonata of the Dominican Republic

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Keywords: distribution records, Odonata, damselflies, dragonflies, Dominican Republic

Abstract

The Dominican Republic is known to support 19 species of damselflies (Zygoptera), of which four are endemic to the island, and 48 species of dragonflies (Anisoptera) of which three are endemic to the island. We present 173 new provincial records for 49 of the 67 known insular species. All newly reported provincial records are given with full data. For all species a complete list of reported provinces is provided. Study of the species of *Sympetrum* on the island reveals that it is *S. gilvum* not *S. illotum*. Due to lack of substantiated records we question the presence of *Hypolestes clara*, *Progomphus integer*, and *Erythemis attala* on the island.

Introduction

Two republics are situated on the Greater Antillean island of Hispaniola, the Dominican Republic on the eastern end and the Republic of Haiti on the western (Fig. 1). The land area of the Dominican Republic is 48,137 sq km with a population of over 7.25 million, while the Republic of Haiti at 27,750 sq km is a bit more than half as large but with a population equally as large. The entire island is south of the Tropic of Cancer thus making it technically Tropical, but its climate is moderated by the surrounding seas. Hispaniola at 76,192 sq km is the second largest Greater Antillean island after Cuba at 113,52 sq km, but much larger than Jamaica at 11,580 sq km or Puerto Rico at 8,865 sq km. The highest peak in the Greater Antilles is Pico Duarte in the Dominican Republic at 3,098 m. Blue Mountain Peak is the highest on Jamaica at 2,252 m, Pico Turquino at 1,999 m is the highest point on Cuba, and Cerro de Punta on Puerto Rico reaches 1,338 m.

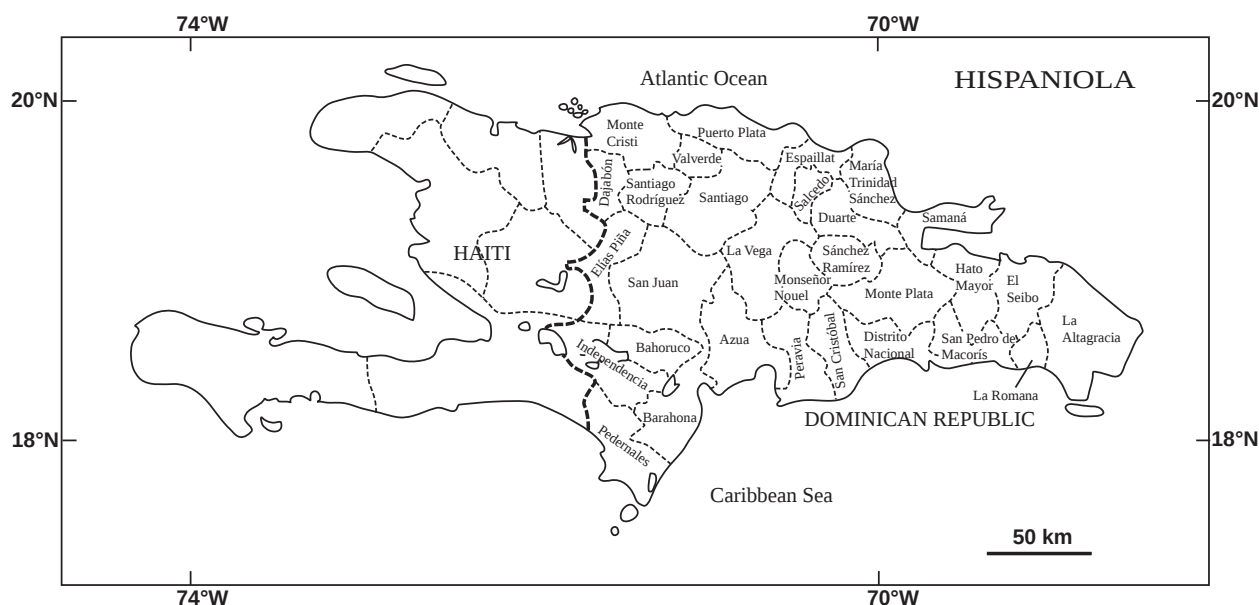
There are three primary mountain ranges in the Dominican Republic: the Cordillera Central, with Pico Duarte, is the largest and highest and continues as a series of massifs across northern Haiti, forming its northern arm; the Cordillera Septentrional follows the north coast of the Dominican Republic north of the Valle del Cibao; and the Sierra de Bahoruco is found in the southwestern margin of the Dominican Republic and continues westward in Haiti as the several massifs of its southern arm. To the north of the Sierra de Bahoruco is the depression of Enriquillo with its lake surface at about 40 m below sea level. This depression is bordered to the north by a lesser range, the Sierra de Neiba, which extends across central Haiti.

Geologically the island is very complex being formed of several terranes accreted since the late Cretaceous through the Cenozoic (Donnelly 1988, Lewis & Draper 1990). Some of these, such as the Sierra de Bahoruco and Sierra de Neiba are mostly limestone with few surface streams, but with numerous large springs at their lower levels. The Cordilleras Central and Septentrional are of much more mixed origin with metamorphic and even extrusive rock, which results in many more streams and rivers, especially at higher elevations.

Odonatological Investigations

Linnaeus was the first to describe in 1758 a species now known to occur in the Dominican Republic (*Erythrodiplax umbrata*). In 1839 Burmeister described *Dythemis rufinervis* and *Scapania frontalis* and recorded *Macrothemis celeno* from Hispaniola, the first species to be described and/or recorded from the island. In 1861 Hagen in his compendium on the neuropteroids of the New World only listed six taxa from "St. Domingo". In the years since, additional species have been described and recorded from the island in many individual works. The first work to bring all these records together was the manual of dragonflies by Needham & Westfall (1955), and this did not treat the damselflies. They listed 36 species of dragonflies, of which seven were recorded from Haiti only. The first synthesis of the entire Hispaniolan odonate fauna is Paulson (1982), in which 54 species are listed (15 damselflies and 39 dragonflies). The present authoritative works on North American Odonata, including the Greater Antilles, are "Damselflies of North America" by Westfall & May (1996) and "Dragonflies of North America" by Needham, Westfall & May (2000). In these are keys and illustrations of all the species known from the West Indies, of which 19 damselflies (the

Fig. 1. Hispaniola and the provinces of Dominican Republic.



dubious record of *Hypolestes clara* from Haiti is not considered in the following accounts) and 48 dragonflies are listed from Hispaniola (Appendix). In addition two fossil species of damselflies have been described from Dominican amber.

Most of the early records gave only “St. Domingo, Santo Domingo, Haiti,” etc. Thus there was little specific locality data other than the island or republic. Recently Daigle (1993, 1996) compiled lists of the species with the provinces of known occurrence. These have been supplemented by data from Meurgey & Perron (2004) and Fernández-Martínez (2004). These lists have been the basis from which the present study has evolved.

Biogeography

Of the 19 species of damselflies, four are endemic to the island. Within the dragonflies only three of the 48 species are island endemics, all in the genus *Progomphus* (Table 1). However, if you consider the fauna of the four major Greater

Antillean islands (perhaps with a few records of wanderers or small colonies nearby) there are 17 species of damselflies and 11 of dragonflies that are regional endemics.

Table 2 shows the number of species known from each of the Greater Antillean islands, as far as can be ascertained. It is notable that the number of species per island follows the same order as the size of each island and, more or less, the closeness to a mainland area. The degree of endemism is also higher on the larger islands, as might be expected. Table 3 shows how the faunas on the islands, and even with the mainland, are strongly shared. This is interpreted as indicative of the vagility of the odonate fauna inhabiting the islands.

In spite of all the recent collecting, much of the island is very poorly known. Haiti is barely sampled, as is the eastern half of the Dominican Republic. The northern ranges are poorly sampled, although the recent collections reported here suggest a fauna as diverse as the central ranges.

Material and Methods

The majority of the material on which this paper is based, is found in two collections: National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (NMNH) and Fundación Moscoso Puello, Santo Domingo, Dominican Republic (FMP). In addition Dr. Dennis R. Paulson, Seattle, Washington, USA (DRP) and Dr. Rosser W. Garrison, Sacramento, California, USA (RWG) provided us with lists of the material in their personal collections from the Dominican Republic. Records were supplied by Mr. Bill Mauffray from the Florida State Collection of Arthropods, Gainesville, Florida, USA (FSCA).

Table 1. Damselflies and dragonflies endemic to Hispaniola.

ZYGOPTERA

- Diceratobasis melanogaster* Garrison, 1986
- Protoneura dunklei* Daigle, 1990
- Protoneura sanguinipes* Westfall, 1987
- Phyllestes ethelae* Christiansen, 1947

ANISOPTERA

- Progomphus serenus* Hagen, 1878
- Progomphus tennesseus* Daigle, 1996
- Progomphus zephyrus* Needham, 1941

Table 2. Number of Odonata species, number of endemics and percentages of endemism in the island of the Greater Antilles.

	Species	Endemics	%
Cuba	81	6	7.40
Hispaniola	67	7	10.45
Jamaica	62	1	1.61
Puerto Rico	50	0	0.00

Table 3. Number of Odonata species shared between Hispaniola and neighboring lands.

	Species	%
Cuba–Hispaniola	57	85
Jamaica–Hispaniola	55	82
Puerto Rico–Hispaniola	50	75
Continent–Hispaniola	48	72

In recent years two provinces of the Dominican Republic have been divided into two. The old province of Peravia was divided in the middle, east to west, with the northern half becoming the Province of San José de Ocoa, the bottom half remaining the Province of Peravia. The Distrito Nacional was restricted to the city of Santo Domingo; all the surrounding region of the old Distrito Nacional becoming the Province of Santo Domingo. Because of the virtual impossibility of now determining to what part of the region most old records (by province only) really pertain to, we still retain the older, broad definition of these two areas.

With the locality data for many collections is a RD-### number; this is the field collection number of Daniel Perez-Gelabert. There is some habitat data associated with these field notes and is available upon inquiry. To help save space the collectors names have been abbreviated and are listed alphabetically below as completely as we know them.

AF = Andrés Francisco
 AM = Arlen Marmolejo
 AS = S. Schwartz
 BHG = Brigido Hierro-Garcia
 DM = Dave Matusik
 D & MD = Donald R. & Mignon B. Davis
 DPG = Daniel E. Perez-Gelabert
 HA = Hector Andujar
 HAH = H.A. Hespeneheide
 JA = John Anderson
 JG = José Gómez
 LR = Litay Ramos
 OSF = Oliver S. Flint, Jr.
 P & PS = Paul J. & Phyllis M. Spangler
 RDM = R.D. Miguel
 REW = Robert E. Woodruff
 RAF = Robin A. Faitoute
 RHB = Ruth H. Bastardo
 RFK = R.F. Klinikowski
 R & JG = Rosser W. & J.A. Garrison
 RMB = Richard M. Baranowski
 RT = R. Thomas
 RWG = Rosser W. Garrison
 WNM = Wayne N. Mathis

UTM localities refer to zone 19.

COENAGRIONIDAE

Diceratobasis melanogaster Garrison 1986

This species is known only from the Dominican Republic. It breeds in the water in the axils of bromeliads. It has been recorded from the Provinces of La Vega and Monseñor Nouel. We have also taken the species in La Vega and can add María Trinidad Sánchez.

New Record: **María Trinidad Sánchez**, Reserva Científica Loma Guaconejo, Alto del Rancho, 170 m, 19°18.75'N, 69°56.66'W, 24–26 Jul 2002, RHB, 1 ♀ (FMP).

Enallagma civile (Hagen 1861)

This widespread species is recorded from throughout the Greater Antilles and the Bahamas, and on the continent from southern Canada to northern South America. In the Dominican Republic it has been recorded from La Vega and Puerto Plata and the Distrito Nacional. In addition to many records from La Vega Province, we can add Barahona, El Seibo, Monte Cristi, Pedernales, and Samaná.

New Records: **Barahona**, ponds at “La Lima” and “La Mina”, Cortico, 1350 & 1300 m, 18°06.8'N, 71°13.9'W & 18°06.7'N, 71°13.4'W, 23 Mar 1999, OSF, 6 ♂, 2 ♀ (NMNH); Monteadá Nueva, Cortico, cloud forest, 18°06.39'N, 71°13.25'W, 1462 m, 10 Apr 2004, DPG, RHB, BHG, 3 ♂ (FMP). **El Seibo**, road El Seibo-Miches, temporary pond, 300 m in diameter, 18°55.44'N, 69°05.78'W, 504 m, 18 Dec 2003, DPG, RHB, BHG, 1 ♂ (FMP); near Laguna El Limón, 18°59.28'N, 68°52.29'W, 10 m, 18 Dec 2003, DPG, RHB, BHG, RD-204, 1 ♂ (FMP). **Monte Cristi**, ca. 100 m from Playa Buen Hombre, 19°51.80'N, 71°24.18'W, 26 m, 17 Apr 2004, DPG, RHB, BHG, RD-225, 1 ♂ (FMP). **Pedernales**, 32 km N of Cabo Rojo, ca. 1200 m, 22 Jun 1999, REW & RMB, 1 ♂ (FSCA). **Samaná**, Loma Pan de Azúcar, 29–30 Nov 2003, DPG, RHB, AF, RD-180, 1 ♀ (FMP).

Enallagma coecum (Hagen 1861)

This very common damselfly is found on almost every watercourse on the Greater Antilles, and is additionally reported from Florida and the Lesser Antilles. It is reported also from Mexico to Brazil, but these refer to the similar species *E.*

novaehispaniae (T. Donnelly, pers. com.). It is known from Azua, Barahona, Dajabón, El Seibo, La Vega, Monseñor Nouel, Monte Cristi, Pedernales, Puerto Plata, Sánchez Ramírez, San Cristóbal, Santiago and the Distrito Nacional. We have more records from most of these provinces, and new ones from Elías Piña, Independencia, Peravia, María Trinidad Sánchez, Samaná, San Juan, and Valverde.

New Records: **Elías Piña**, Río Limpio, 781 m, 19°14.69'N, 71°31.99'W, 24 Jul 2003, DPG, RHB, BHG, RD-162, 1 ♂ (FMP); same, but by river, 19°14.22'N, 71°31.99'W, 770 m, 25 Jul 2003, RD-163, 7 ♂, 2 ♀ (FMP). **Independencia**, Río Las Damas, ca. 1 km S Duvergé, Parque Nacional Sierra de Bahoruco, 18°22.28'N, 71°31.94'W, 5 Jul 2003, DPG, RHB, BHG, RD-141, 1 ♂, 2 ♀ (FMP); Puerto Escondido, ca. 12 km SSW Duvergé, 18°19.6'N, 71°35.0'W, 24 Mar 1999, OSF, 4 ♂, 2 ♀ (NMNH); La Descubierta, spring runs in town park, 0 m, 18°34.1'N, 71°43.8'W, 25 Mar 1999, OSF, 1 ♂ (NMNH). **Peravia**, Honduras, Baní, Matadero, vicinity of the village aqueduct, 28 Sep 2002, RHB, 1 ♂ (FMP); 3.5 km SE El Cacao, 21 Jun 1964, RT, (DRP); Baní, Cerro Gordo, ca. 1 km from the exit of Baní-Salinas road, at the canal Marcos A. Cabral, ca. 170 m, 18°16.04'N, 70°20.63'W, 23 Nov 2003, DPG, RHB, RD-176, 1 ♂ (FMP). **María Trinidad Sánchez**, El Papayo, Peonía, 24 Jul 2002, RHB, 3 ♂ (FMP). **Samaná**, La Laguna, 54 m, 19°15.01'N, 69°18.47'W, 28–29 Nov 2003, DPG, RHB, AF, RD-179, 2 ♂ (FMP). **San Juan**, road San Juan-Vallejuelo, dry forest, 18°41.75'N, 71°11.73'W, 449 m, 21 Apr 2004, DPG, RHB, BHG, RD-232, 1 ♂ (FMP); 14 km road San Juan-Las Matas de Farfán, 18°50.06'N, 71°21.03'W, 500 m, 22 Apr 2004, DPG, RHB, BHG, RD-236, 1 ♂ (FMP). **Valverde**, Ranchete, Cordillera Septentrional, 5 Jun 1969, OSF & JG, 4 ♂ (NMNH).

Ischnura capreolus (Hagen 1861)

This tiny species is widely distributed but infrequently taken. It is recorded from all the Greater, and many of the Lesser, Antillean islands, and from Mexico south to Argentina and Peru. It has only been recorded from the Province of San Cristóbal in the Dominican Republic, and we have another collection from the Distrito Nacional.

New Record: **Distrito Nacional**, Guerra, 11 Jun 1969, OSF & JG, 1 ♂, 2 ♀ (NMNH).

Ischnura hastata (Say 1839)

Another small species, this one found on all the Greater and Lesser Antillean islands, throughout most of the United States and southeastern Canada into South America. It is recorded from La Vega, Monseñor Nouel and Puerto Plata, and we have additional records from the Province of La Vega, and can add Barahona, Monte Cristi, Peravia, San Cristóbal

and Distrito Nacional.

New Records: **Barahona**, ponds at “La Lima” and “La Mina”, Cortico, 1350 & 1300 m, 18°06.8'N, 71°13.9'W & 18°06.7'N, 71°13.4'W, 23 Mar 1999, OSF, 2 ♂ 2 ♀; spring run and marsh, Ojeda (south of Paraiso), 5 m, 17°58.2'N, 71°10.6'W, 22 Mar 1999, OSF, 1 ♂ (NMNH). **Distrito Nacional**, botanical garden, Santo Domingo, 18°29.9'N, 69°56.9'W, 26 Mar 1999, WNM, 1 ♀ (NMNH); ponds NE Guerra, 11 Jun 1969, OSF, 2 ♀ (NMNH). **Monte Cristi**, Villa Vásquez, road to Buen Hombre, dry forest, 132 m, 19°46.21'N, 71°24.00'W, 6 Dec 2003, DPG, RHB, AM, RD-186, 1 ♀ (FMP). **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF, 1 ♂, 1 ♀ (NMNH). **San Cristóbal**, left bank, Río Nizao, near the bridge of the “Autopista Sánchez”, crepuscular—6–7 PM, 8 Aug 2001, RHB, 1 ♀ (FMP). **Valverde**, ditch between Cruce de Guayacanes and Río Yaque del Norte, 5–6 Jun 1969, OSF & JG, 1 ♂, 1 ♀ (NMNH).

Ischnura ramburii (Selys 1842)

This widespread species of the New World is mainly coastal in the northern United States, but widespread throughout the south and central regions, and then found as far south as northern Peru, and on all the Greater and Lesser Antilles as well as the Bahamas, Bermuda and Hawaii. There are records from Azua, Barahona, La Vega, Monseñor Nouel, Samaná, and Santiago. We have also taken it in Barahona and La Vega, and can add Elías Piña, Independencia, Monte Cristi, Pedernales, Peravia, Puerto Plata, San Cristóbal, and Valverde, and the Distrito Nacional.

New Records: **Distrito Nacional**, km 18 “Autopista Duarte”, Urb. Los Cerros, Santo Domingo, in a brook (humid) very contaminated by waters used by the communities above, 21 Oct 2001, RHB, 3 ♂, 7 ♀ (FMP); ponds NE Guerra, 11 Jun 1969, OSF, 8 ♂, 14 ♀ (NMNH); 4 km N Guerra, 15 Nov 1984, P & PS, RF, 2 ♀ (NMNH); botanical garden, Santo Domingo, 18°29.9'N, 69°56.9'W, 26 Mar 1999, WNM, 2 ♂ (NMNH); 28 km E San Isidro, 26 Aug 1980, RWG, 1 ♂ (RWG). **Elías Piña**, Río Limpio, 781 m, 19°14.69'N, 71°31.99'W, 24–25 Jul 2003, DPG, RHB, BHG, RD-162, 1 ♂ (FMP). **Independencia**, Río Las Damas, 2 km SSW Duvergé, 10 m, 18°22.0'N, 71°31.4'W, 24 Mar 1999, OSF, 1 ♀ (NMNH). **Monte Cristi**, 3 km before arriving at the town (from Navarrete), 0 m, UTM 224945 E, 2195362 N, 5 Dec 2002, RHB, 1 ♂, 3 ♀ (FMP); Villa Vásquez, Uvero, road to Buen Hombre, dry forest, 200 m, 19°48.71'N, 71°23.96'W, 7 Dec 2003, DPG, RHB, AM, RD-187, 2 ♂ (FMP); ca. 100 m from Playa Buen Hombre, 19°51.80'N, 71°24.18'W, 26 m, 17 Apr 2004, DPG, RHB, BHG, RD-225, 4 ♂ (FMP). **Pedernales**, Bucán de Tuí, Oviedo, Parque Nacional Jaragua, 0 m, 17°43.95'N, 71°30.14'W, 4 Dec 2002, RHB, 2 ♀ (FMP). **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969,

OSF, 3 ♂, 1 ♀ (NMNH). **Puerto Plata**, Cabarete, P.N. El Choco, El Callejón de la Loma, 19°44.43'N, 70°25.46'W, 110 m, 13 Apr 2004, DPG, RHB, BHG, RD-220, 5 ♂ (FMP). **San Cristóbal**, E bank, Río Nizao, near the bridge of the "Autopista Sánchez", 18°16.51'N, 70°12.53'W, 8 Aug 2001, RHB, DPG, 2 ♂, 2 ♀ (FMP, NMNH); Río Nizao, 10 Jul 2003, DPG, RHB, BHG, 1 ♂, 1 ♀ (FMP). **Valverde**, ditch between Cruce de Guayacanes and Río Yaque del Norte, 5–6 Jun 1969, OSF & JG, 4♂, 3♂ (NMNH).

Leptobasis vacillans Hagen 1877

The species has been recorded from all the Greater Antillean islands, and on the mainland from southern Mexico south and east to the Guianas and Ecuador. It has been recorded a few times from the Dominican Republic: La Altagracia, La Vega, San Cristóbal, and Santiago. We have new records from Azua, El Seibo, Monte Cristi, San Juan, and the Distrito Nacional.

New Records: **Azua**, ca. 4 km N of Padre Las Casas, on road to Lagunas, 613 m, 18°44.91'N, 70°55.44'W, 23 Nov 2002, DPG, BHG, HA, 2 ♂, 1 ♀ (FMP). **Distrito Nacional**, in the Instituto de Microbiología y Parasitología of the Universidad Autónoma de Santo Domingo, entered the building at 12 PM, 23 Nov 2001, LR, 1 ♀ (FMP); Sierra Prieta, Villa Mella, Alto del Chivo, in the forest, far from water, 18°38.925'N, 69°58.303'W, 142 m, 5 Jun 2004, RHB, JA, 1 ♂ (FMP). **El Seibo**, road Nisibón-Higüey, Río Yonu, 18°47.78'N, 68°40.03'W, 20 m, 19 Dec 2003, DPG, RHB, BHG, RD-205, 1 ♂, 1 ♀ (FMP). **Monte Cristi**, 3 km before arriving at the town (from Navarrete), 0 m, UTM 224945 E, 2195362 N, 5 Feb 2002, RHB, 1♂, 2♀ (FMP). **San Juan**, 14 km road San Juan–Las Matas de Farfán, 18°50.06'N, 71°21.03'W, 500 m, 22 Apr 2004, DPG, RHB, BHG, RD-236, 1♂, ♀ (FMP).

Nehalennia minuta (Selys 1857)

The species is known from all the Greater Antillean islands, Grand Cayman and the Bahamas, and from Mexico south to Brazil and Trinidad. On the Dominican Republic it had only been recorded from the Distrito Nacional, where we have also taken it as well as in the Province of Sánchez Ramírez.

New Record: **Sánchez Ramírez**, Mina Pueblo Viejo, Hatillo, Margajita, small pond with aquatic vegetation, UTM 369310 E, 2095124 N, 23 Apr 2003, RHB, 12 ♂, 2 ♀ (FMP, NMNH).

Neoerythromma cultellatum (Hagen 1876)

This species is known from all the Greater Antillean islands,

Florida in the United States, and from northern Mexico south to Venezuela. It had previously been recorded only from Barahona, but we have records from El Seibo, Monte Cristi and Peravia.

New Records: **El Seibo**, near Laguna El Limón, 18°59.28'N, 68°52.29'W, 10 m, 18 Dec 2003, DPG, RHB, BHG, RD-204, 4 ♂, 3 ♀ (FMP). **Monte Cristi**, 3 km before arriving at the town (from Navarrete), 0 m, UTM 224945 E, 2195362 N, 5 Feb 2002, RHB, 1 ♂ (FMP). **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF, 15 ♂, 2 ♀ (NMNH).

Telebasis dominicana (Selys 1857)

The species is apparently endemic to the Greater Antilles, where it is reported from all the islands as well as the Bahamas.

It is widely distributed in the Dominican Republic, being reported from Barahona, El Seibo, La Altagracia, La Vega, Puerto Plata, San Cristóbal, San Juan, and Santiago plus the Distrito Nacional. We have additional records from Barahona, El Seibo, La Vega, Puerto Plata, San Cristóbal, San Juan and the Distrito Nacional, and can add the Provinces of Azua, Independencia, Peravia, and Sánchez Ramírez.

New Records: **Azua**, Padre Las Casas, Las Lagunas, Laguna Grande, 19°48.09'N, 70°52.84'W, 23 Nov 2002, DPG, BHG, HA, 5 ♂ (FMP). **Independencia**, Puerto Escondido, ca. 12 km SSW Duvergé, 18°19.6'N, 71°35.0'W, 24 Mar 1999, OSF, 3 ♂ (NMNH). **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF, 2 m 1 f (NMNH). **Sánchez Ramírez**, Río Maguaca (EL-5T), 2 km SE Mina Pueblo Viejo, 3 Aug 2003, RHB, 1 ♂ (FMP); Mina Pueblo Viejo, Loma de Zambrana, Arroyo Mejita (very acid), UTM 377059 E 2094269 N, 1 May 2003, RHB, 1 ♂, 1 ♀ (FMP); Mina Pueblo Viejo, Hatillo, Margajita, small pond with aquatic vegetation, UTM 369310 E, 2095124 N, 23 Apr 2003, RHB, 1 ♂ (FMP); Mina Pueblo Viejo, Arroyo El Llagal (EL-3T), stream with rapid current, shallow, UTM 376420 E, 2089887 N, 24 Apr 2003, RHB, 1 ♂ (FMP); 2 km SE Mina Pueblo Viejo, Río Maguaca (EL-5T), 3 Aug 2003, RHB, 2 ♂, 1 ♀ (FMP); Mina Pueblo Viejo, Río Maguaca, Arroyo Cañada Honda (MG-1T), 2 Aug 2003, RHB, 2 ♂ (FMP); Mina Pueblo Viejo, Arroyo Rey, ca. 1 km N Club Taíno (PV-1T), shallow stream, muddy bottom, UTM 377063 E 2095641 N, 15 Aug 2003, RHB, 1 F (FMP).

Telebasis vulnerata (Hagen 1861)

This species is endemic to the Greater Antilles, but has not yet been found on Cuba. It is about as widespread in the Dominican Republic as *T. dominicana*, but prefers higher elevations and more shady sites. It is recorded from the Prov-

inces of Duarte, El Seibo, La Vega, Puerto Plata, San Juan, Santiago, and the Distrito Nacional. We have taken it also in El Seibo, La Vega, Puerto Plata, and the Distrito Nacional, and can add Azua, Dajabón, Independencia, Pedernales, Peravia, Sánchez Ramírez, and San Cristóbal.

New Records: **Azua**, Las Yayitas, ca. 300 m, 18°30.19'N, 70°44.52'W, 8 Aug 2001, DPG, 1 ♂ (NMNH); Peralta, Río Jura, 510 m, UTM 314905 E, 2054914 N, 16 Jan 2002, RHB, 1 ♂ (FMP). **Dajabón**, Loma de Cabrera, 24 May 1973, D & MD, 3 ♂ (NMNH). **Independencia**, La Descubierta, spring runs in town park, 0 m, 18°34.1'N, 71°43.8'W, 25 Mar 1999, OSF, 4 ♂, 2 ♀ (NMNH). **Pedernales**, stream and cascade, 19 km N Pedernales, 230 m, 18°09.2'N, 71°44.8'W, 19 Mar 1999, OSF, 1 ♂, 3 ♀ (NMNH). **Peravia**, Baní, 9 km from the entrance at Honduras, road to Matadero, 18°23.46'N, 70°25.86'W, 27 Jul 2002, DPG, RHB, 4 ♂ (FMP); Honduras, Baní, Matadero, vicinity of the village aqueduct, 28 Sep 2002, RHB, 2 ♂ (FMP); Matadero, dry forest, 18°23.59'N, 70°25.03'W, 159 m, 14 Dec 2003, DPG, RHB, BHG, RD-197, 4 ♂ (FMP). **Sánchez Ramírez**, Mina Pueblo Viejo, Maguaca (MG-2T), disturbed riverine forest, small stream, sandy bottom, UTM 379959 E 2094844m N, 23 Apr 2003, RHB, 1 ♂ (FMP); Mina Pueblo Viejo, Arroyo El Llagal (EL-3T), stream with rapid current, shallow, UTM 376420 E, 2089887 N, 24 Apr 2003, RHB, 1 ♂ (FMP); Mina Pueblo Viejo, Cotuí, Fátima (EL-IT), 3 Aug 2003, RHB, 1 ♂, 2 ♀ (FMP); Mina Pueblo Viejo, Arroyo Rey, ca. 1 km N Club Taíno (PV-IT), shallow stream, muddy bottom, UTM 377063 E, 2095641 N, 15 Aug 2003, RHB, 1 ♂ (FMP). **San Cristóbal**, La Piedra, margin of the Río Mahomita, 580 m, UTM 359504 E, 2057363 N, 6 Jan 2002, RHB, 1 ♂ (FMP); path from La Palma to Arroyo Santana, 880 m, UTM 356900 E, 2057363 N, 6 Jan 2002, RHB, 1 ♂ (FMP); 5 km NE Villa Altagracia, dirt rd. off km 41 Carretera Duarte, 285 m, 18°42.86'N, 70°10.31'W, 12 Apr 2003, RHB, DPG, BHG, RD-130, 1 ♂, 1 ♀ (FMP).

LESTIDAE

Lestes forficula Rambur 1842

This seems to be the most frequently encountered lestid on Hispaniola. It is recorded from Barahona, Duarte, La Vega, Monseñor Nouel, and Puerto Plata and the Distrito Nacional. We have it also from Barahona, Duarte and the Distrito Nacional, and add Azua and El Seibo. It is recorded from all the Greater Antillean islands and from Texas south to Brazil.

New Records: **Azua**, Padre Las Casas, Las Lagunas, Laguna Grande, 19°48.09'N, 70°52.84'W, 23 Nov 2002, DPG, BHG, HA, 1 ♀ (FMP); Las Yayitas, Río Las Yayitas, UTM 316230 E, 2046941 N, 240 m, 15 Jan 2002, RHB, 3 ♂, 1 ♀

(FMP). **El Seibo**, road El Seibo-Miches, temporary pond ca. 300 m in diameter, 18°55.44'N, 69°05.78'W, 504 m, 18 Dec 2003, DPG, RHB, BHG, 1 ♀ (FMP).

Lestes scalaris Gundlach 1888

This Antillean endemic has been recorded from all the Greater Antillean islands and the Bahamas. It has been recorded (Paulson 1982, Westfall & May 1996) from Hispaniola and the Dominican Republic, but without specific locality. There is an old specimen in the NMNH that we record here.

New Record: [**Samaná**], "Samaná, Santo Domingo, Dr. Miller (rec'd 1916)", 1 ♂, Det. M.J. Westfall (NMNH).

Lestes spumarius Hagen 1862

Another almost Antillean endemic has been recorded from all the Greater Antillean islands, the Bahamas and southern Florida. It has been recorded from La Vega, Santiago and the Distrito Nacional in the Dominican Republic. We have taken it in the Distrito Nacional, and newly record it from Samaná.

New Record: **Samaná**, La Laguna, 54 m, 19°15.01'N, 69°18.47'W, 28–29 Nov 2003, DPG, RHB, AF, RD-179, 1 ♀ (FMP).

MEGAPODAGRIONIDAE

Hypolestes trinitatis (Gundlach 1888)

The exact systematic status of the species of *Hypolestes* found on Hispaniola is confusing (Dunkle 1991), but is considered to be *H. trinitatis*, a species endemic to the islands of Cuba and Hispaniola, while the closely related *H. clara* is limited to Jamaica (*H. clara* has also been reported from Haiti, but this remains to be confirmed). *H. trinitatis* is most frequently found in small, forested streams, usually in the mountains. It is recorded from Barahona, La Vega, Monseñor Nouel, Puerto Plata, Samaná, and San Cristóbal as well as the Distrito Nacional. We have new records from Azua, Duarte, María Trinidad Sánchez, and Sánchez Ramírez, as well as La Vega, Monseñor Nouel, Puerto Plata, San Cristóbal and the Distrito Nacional.

New Records: **Azua**, Las Yayitas, in a contaminated stream, ca. 300 m, 18°30.19'N, 70°44.52'W, 8 Aug 2001, DPG, RHB, 8 ♂, 4 ♀ (FMP, NMNH); same, but Río Las Yayitas, UTM 316230 E, 2046941 N, 240 m, 15 Jan 2002, RHB, 2 ♂, 1 ♀ (FMP). **Duarte**, Loma Quita Espuela, Arroyo de Cadillar, 425 m, 19°20.91'N, 70°08.84'W, 2–3 Dec 2003, DPG, RHB, AM, 1 ♂ (FMP). **María Trinidad Sánchez**, Reserva Cientí-

fica Loma Guaconejo, Alto del Rancho, 170 m, 19°18.75'N, 69°56.66'W, 24–26 Jul 2002, RHB, 4 ♂, 4 ♀ (FMP). **Sánchez Ramírez**, Mina Pueblo Viejo, Arroyo Rey, ca. 1 km N of Club Taino (PV-1T), shallow stream, clayey bottom, UTM 377063 E, 2095641 N, 22 Apr 2003, RHB, 3 ♂ (FMP); Mina Pueblo Viejo, Arroyo El Llagal (EL-3T), stream with rapid current, shallow, UTM 376420 E, 2089887 N, 24 Apr 2003, RHB, 4 ♂, 1 ♀ (FMP); Mina Pueblo Viejo, El Llagal, Río Naranjo, (EL-4T), UTM 377988 E, 2089742 N, 16 Aug 2003, RHB, 1 ♂ (FMP); Mina Pueblo Viejo, Cotuí, Fátima (EL-1T), 3 Aug 2003, RHB, 3 ♂, 2 ♀ (FMP); Cotuí, La Piñita, Mina Pueblo Viejo, Río Maguaca (EL-2T), UTM 371464 E, 2091355 N, 3 Aug 2003, RHB, 1 ♂, 1 ♀ (FMP); Cotuí, Yagrumbo, 3 Aug 2003, RHB, 1 ♂, 1 ♀ (FMP).

PROTONEURIDAE

Protoneura dunklei Daigle 1990

This recently described species was known only from the Provinces of Dajabón and La Vega in the Dominican Republic. We have taken a few more examples, mostly in La Vega, but also adding the Province of Azua.

New Record: **Azua**, Las Yayitas, Loma El Cucurucho, 814 m, 18°30.90'N, 70°43.22'W, 21–22 Nov 2003, DPG, RHB, AF, RD-175, 1 ♂ (FMP).

Protoneura sanguinipes Westfall 1987

Another recently described species that is apparently endemic to the Dominican Republic. It has been recorded from Dajabón and the Distrito Nacional. We have seen examples from the Distrito Nacional, and also add María Trinidad Sánchez.

New Record: **María Trinidad Sánchez**, Reserva Científica Loma Guaconejo, Alto del Rancho, 170 m, 19°18.75'N, 69°56.66'W, 24–26 Jul 2002, RHB, 4 ♂, 4 ♀ (FMP).

Protoneura viridis Westfall 1964

This species is known from Jamaica, Puerto Rico and the Virgin Islands of St. Thomas and St. John in addition to the Dominican Republic. It has been reported from El Seibo, La Vega, Puerto Plata, and San Cristóbal and the Distrito Nacional. We have records from El Seibo, La Vega, Puerto Plata, San Cristóbal, the Distrito Nacional and can add María Trinidad Sánchez and Sánchez Ramírez.

New Records: **María Trinidad Sánchez**, Nagua, in the auditorium of the university (UASD), 15 Oct 2002, RHB, 1 ♂ (FMP); Nagua, urban zone, 19°22'18"N, 69°51'10"W, 19 m, 13 Mar 2004, RHB, 1 ♂ (FMP). **Sánchez Ramírez**,

Mina Pueblo Viejo, ca. 20 m from bridge over Río Maguaca (MG-3T), UTM 381279 E 2096647 N, 1 May 2003, RHB, 1 ♀ (FMP); Mina Pueblo Viejo, El Llagal, Río Naranjo, (EL-4T), UTM 377988 E, 2089742 N, 16 Aug 2003, RHB, 1 ♂ (FMP).

SYNLESTIDAE

Phylolestes ethelae Christiansen 1947

This remarkable damselfly, the only member of its family in the New world, is restricted to the island of Hispaniola. It was described from Haiti, but is now known also from the Provinces of La Vega and Monseñor Nouel in the Dominican Republic. We have taken further examples in both the named provinces, and can add Elías Piña and Santiago, also in the Cordillera Central.

New Records: **Elías Piña**, Río Limpio, 781 m, 19°14.69'N, 71°31.99'W, 24–25 Jul 2003, DPG, RHB, BHG, RD-162, 1 ♀ (FMP). **Santiago**, Diferencia, Parque Nacional Armando Bermúdez, vicinity of the house at the Río Sierrecita, 890 m, 19°14.89'N, 71°04.74'W, 9 Apr 2003, RHB, DPG, BHG, RD-128, 2 ♂, 1 ♀ (FMP); San José de las Matas, road Rincón de Piedra-Mata Grande, close to Río Bao, 19°12.82'N, 71°57.71'W, 770 m, 28 Apr 2004, DPG, RHB, BHG, RD-246, 1 ♀ (FMP).

AESHNIDAE

Anax amazili (Burmeister 1839)

Although reported from La Vega Province, this species has been taken rarely on the island. We have one record from Monte Cristi Province. It is also known from the southernmost United States south to Brazil, including the Greater Antilles, but not reported from Jamaica.

New Record: **Monte Cristi**, ca. 3 km SE Monte Cristi, very dry forest, 42 m, 19°50.12'N, 71°37.23'W, 42 m, 23 Jul 2003, DPG, RHB, BHG, (night) RD-161, 1 ♂ (FMP)

Anax concolor Brauer 1865

The species is reported from La Vega and Monseñor Nouel as well as the Distrito Nacional. We have no new records. The species is known from the Bahamas, the Greater and Lesser Antilles and on the continent from Mexico south to Brazil.

Anax junius (Drury 1861)

The species has only been reported from the Province of Monseñor Nouel and the Distrito Nacional. We have no new records. In addition to all the Greater Antillean islands,

it is known from all the United States and southern Canada south into northern Central America, with an isolated population in Hawaii. Wanderers have been reported from eastern Asia and western Europe. The northern populations in the United States and Canada migrate to the south in the fall and back north in the spring, but the lack of records from Hispaniola suggests that they do not get that far south.

Coryphaeschna adnexa (Hagen 1861)

There are scattered records of this species from La Vega and Santiago, as well as the Distrito Nacional. We add Barahona and Sánchez Ramírez. It is known from all the Greater Antilles, southern Florida and Texas south to Brazil.

New Records: **Barahona**, 6.5 km E Cabral, 13 Jun 1968, HAH, DRP). **Sánchez Ramírez**, Mina Pueblo Viejo, Hatillo, Margajita, small pond with aquatic vegetation, UTM 369310 E, 2095124 N, 23 Apr 2003, RHB, 1 ♂, 1 ♀ (FMP).

Coryphaeschna viriditas Calvert 1952

The species is widespread on the Dominican Republic: La Vega, Puerto Plata, Santiago and Samaná Provinces and the Distrito Nacional. We have additional collections from Santiago and the Distrito Nacional. It is found from the southernmost United States, south to Brazil and Bolivia as well as on all the Greater Antillean islands.

Gynacantha nervosa Rambur 1842

This primarily crepuscular species is known from scattered records in the provinces of El Seibo, La Vega, Samaná, Sánchez Ramírez and the Distrito Nacional. We have more records from La Vega, as well as new ones from La Romana, María Trinidad Sánchez, San Cristóbal, and Santiago. The species is widespread in the southeastern United States, throughout the Antilles and south to Brazil and Bolivia.

New Records: **La Romana**, Bayahibe, 31 Jul 2002, DPG, RHB, BHG, night collection, 1 ♀ (FMP); 0.7 mi W Higüey, 31 Aug 1963, RFK (DRP). **María Trinidad Sánchez**, Reserva Científica Loma Guaconejo, Alto del Rancho, 170 m, 19°18.75'N, 69°56.66'W, 24–26 Jul 2002, RHB, 1 ♀ (FMP). **San Cristóbal**, La Toma, north of San Cristóbal, 9–10 Jun 1969, OSF & JG, 2 ♂ (NMNH). **Santiago**, Diferencia, Parque Nacional Armando Bermúdez, vicinity of the house at the Río Sierrecita, 890 m, 19°14.89'N, 71°04.74'W, 9 Apr 2003, RHB, DEP, BHG, RD-128, 1 ♂, 1 ♀ (FMP).

Rhionaeschna psilus (Calvert 1947)

The species is found primarily at higher elevations, being recorded from La Vega and Santiago. We have several records

from La Vega, and have taken it also in Barahona. It is also known from the southwestern United States south to Peru and including all the Greater Antillean islands.

New Record: **Barahona**, pond at “La Mina”, Cortico, Sierra Bahoruco, 1300 m, 18°06.7'N, 71°13.4'W, 23 Mar 1999, OSF, 2 ♂, 3 exuviae (NMNH).

Triacanthagyna septima (Selys 1857)

Although widely distributed in the Greater Antilles and from Mexico south to Brazil and Bolivia, it has only recently been recorded from Hispaniola (La Altagracia Prov., Fernández-Martínez 2004). We have two collections of the species, one from María Trinidad Sánchez, the other from Santiago. The species is recorded from the Florida Keys, Cuba, Jamaica, and Puerto Rico in the Greater Antilles, and from Mexico south to Brazil and Bolivia.

New Records: **María Trinidad Sánchez**, Municipio de Nagua, collected when entering the Salon of Biology in the Regional Center UASD, 7 Sep 2001, RHB, 5:00 PM, 1 ♀ (NMNH). **Santiago**, Diferencia, Parque Nacional Armando Bermúdez, vicinity of the house at the Río Sierrecita, 890 m, 19°14.89'N, 71°04.74'W, 9 Apr 2003, RHB, DPG, BHG, 2 ♂, 1 ♀ (FMP, NMNH).

Triacanthagyna trifida (Rambur 1842)

This species has been recorded from La Vega and Samaná. We have a specimen from San Cristóbal. The species has a rather limited distribution: from North Carolina through Florida in the southeastern United States, the Bahamas, and the four major Greater Antillean islands.

New Record: **San Cristóbal**, 1/2 km east of San Cristóbal, 8 Jun 1969, OSF & JG, 1 ♂ (NMNH).

GOMPHIDAE

Aphylla caraiba (Selys 1854)

Daigle (1993) records this species from La Vega, Monseñor Nouel, Monte Cristi, Samaná, Sánchez Ramírez, San Cristóbal, and the Distrito Nacional, and it has also been recorded from Cuba and Haiti. We have seen examples from Sánchez Ramírez, San Cristóbal, the Distrito Nacional, and with a new record from Valverde. There is a male from Samaná, that was the basis for the Calvert (1902, p. 154) record of *A. producta* from Hispaniola, that has been redetermined as *A. caraiba* by Donnelly.

New Records: “Hayti” [now in the Dominican Republic, Samaná], **Samaná**, Frazar, 1 ♂ (NMNH). **Valverde**, Cruce de

Guayacanes, 5–6 Jun 1969, OSF & JG, 1 ♂ (NMNH).

Progomphus integer Hagen 1878

This has been listed (Needham, Westfall & May 2000, Paulson 1982) from the Dominican Republic and Hispaniola, but without locality. We are unable to verify any Hispaniolan localities, and question its presence on the island. There are verified records only from Cuba and Jamaica.

Progomphus serenus Hagen 1878

This is the most frequently taken species of the genus in the Dominican Republic. It is recorded from La Vega, San Cristóbal, and Santiago and the Distrito Nacional. Our material is from the same provinces. It is endemic to the island of Hispaniola.

Progomphus tennesseus Daigle 1996

This species is still known only from the unique, male type taken in La Vega Province.

Progomphus zephyrus Needham 1941

This is an uncommon species taken mainly in small montane streams. It is known from La Vega, San Cristóbal, and Santiago and the Distrito Nacional, and our two specimens are from La Vega.

New Record: **La Vega**, Salto Jimenoa, SE Jarabacoa, 575 m, 19° 05.01'N 70° 35.92'W 20 May 1995 1 ♂ (OSF).

LIBELLULIDAE

Brachymesia furcata (Hagen 1861)

This species is recorded from Barahona and Monseñor Nouel; we have the material for the Barahona record, as well as more from Peravia and the Distrito Nacional. It is also recorded from Cuba, Jamaica, Bahamas, southern USA, and south through Central America to Brazil including the Lesser Antilles.

New Records: **Distrito Nacional**, Guerra, 11 Jun 1969, OSF & JG, 4 ♂ (NMNH). **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF, 1 ♂ (NMNH).

Brachymesia herbida Gundlach 1888

This species has a range much like the preceding, but is found on all the antillean islands, across the southern United States, and south to Brazil. It is recorded from a number of Provinces in the DR: Barahona, La Vega, Monseñor Nouel,

Samaná, and the Distrito Nacional. We have further material from Barahona and the Distrito Nacional, but no new provincial records.

Cannaphila insularis Kirby 1889

The species is known from a number of localities in the Dominican Republic: Barahona, La Vega, Monseñor Nouel, Puerto Plata, San Cristóbal, Santiago, and Samaná. Otherwise it is only recorded from Cuba in the Greater Antilles, and from Texas south to Brazil. We have additional records from Barahona, La Vega, Puerto Plata, San Cristóbal and a new record from Independencia.

New Record: **Independencia**, La Descubierta, spring runs in town park, 0 m, 18°34.1'N, 71°43.8'W, 25 Mar 1999, OSF, 1 ♂ (NMNH).

Dythemis rufinervis (Burmeister 1839)

This species is endemic to the Greater Antilles, where it is frequently found on all the major islands. It is commonly seen in the Dominican Republic where it has been recorded from Barahona, Duarte, El Seibo, La Vega and Santiago as well as the Distrito Nacional. We have further records from Barahona, El Seibo, La Vega and the Distrito Nacional, and newly record it from Dajabón, Elías Piña, Pedernales, Peravia, Samaná, Sánchez Ramírez, San Cristóbal, San Juan, and Valverde.

New Records: **Dajabón**, Loma de Cabrera, Río Massacre-Balneario El Salto, 20 May 1973, D & MD, 4 ♂ (NMNH). **Elías Piña**, Río Limpio, 781 m, 19°14.69'N, 71°31.99'W, 24–25 Jul 2003, DPG, RHB, BHG, RD-162, 1 ♂ (FMP). **Pedernales**, Isla Beata, Parque Nacional Jaragua, 0 m, 17°36.84'N, 71°31.38'W, 3 Dec 2002, RHB, 1 ♀ (FMP). **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF & JG, 1 ♂ (NMNH); El Maizal, near Presa de Valdesia, 97 m, 18°22.94'N, 70°16.86'W, 31 Jul 2003, DPG, RHB, BHG, RD-171, 1 ♀ (FMP). **Samaná**, Loma Pan de Azúcar, 291 m, 19°15.62'N, 69°17.87'W, 29 Nov 2003, DPG, RHB, RD-180, 1 ♀ (FMP). **Sánchez Ramírez**, Cotuí, Fátima, El Yagrumbo (C-2T), 1 May 2003, RHB, 2 ♀ (FMP); Mina Pueblo Viejo, UTM 375812 E, 2094033 N, 181 m, 23 Apr 2003, RHB, 1 ♂ (FMP); Mina Pueblo Viejo, Cotuí, Fátima (EL-1T), 3 Aug 2003, RHB, 1 ♂ (FMP); Cotuí, La Piñita, Mina Pueblo Viejo, Río Maguaca (EL-2T), UTM 371464 E, 2091355 N, 3 Aug 2003, RHB, 2 ♀ (FMP); 2 km SE Mina Pueblo Viejo, Río Maguaca (EL-5T), 3 Aug 2003, RHB, 1 ♀ (FMP); Cotuí, Yagrumbo, 3 Aug 2003, RHB, 1 ♀ (FMP). **San Cristóbal**, 5 km NE Villa Altagracia, dirt rd. off km 41 Carretera Duarte, 285 m, 18°42.86'N, 70°10.31'W, 12 Apr 2003, RHB, DPG, BHG, RD-130, 2 ♂ (FMP); 1/2 km E San Cristóbal, 8 Jun 1969, OSF & JG, 9 ♂ (NMNH); La Toma, N of San Cristóbal, 9–10 Jun 1969, OSF & JG, 3 ♂ (NMNH).

San Juan, 2 km E road to San Juan, 18°35.25'N, 70°58.09'W, 294 m, 20 Apr 2004, DPG, RHB, BHG, RD-229, 1 ♀ (FMP); road San Juan-Vallejuelo, dry forest, 18°41.75'N, 71°11.73'W, 449 m, 21 Apr 2004, DPG, RHB, BHG, RD-232, 1 ♀ (FMP). **Valverde**, Ranchete, Cordillera Septentrional, 5 Jun 1969, OSF & JG, 1 ♂ (NMNH).

Erythemis attala (Selys 1857)

The species has been recorded from Hispaniola, without a precise locality by Paulson (1982), and from Haiti by Needham, Westfall & May (2000). It is recorded from Cuba and Jamaica, with a vagrant taken in Alabama, but otherwise it is distributed in the Lesser Antilles, and from south Texas south to Argentina. We have no records of the species, and wonder if the Antillean records are not misidentifications of the rather similar *Erythemis plebeja*.

Erythemis plebeja (Burmeister 1839)

The species is recorded from all the Greater Antillean islands, Florida and Texas in the USA, and then south to Argentina. From the Dominican Republic, it is recorded from Azua, Barahona, La Vega and the Distrito Nacional. We have further material from Azua, Barahona and the Distrito Nacional, and can add La Romana, Maria Trinidad Sánchez, Peravia, and San Cristóbal.

New Records: **La Romana**, 0.7 mi. W Higüey, 5 Sep 1963, RFK (DRP). **María Trinidad Sánchez**, Reserva Científica Loma Guaconejo, Alto del Rancho, 170 m, 19°18.75'N, 69°56.66'W, 24–26 Jul 2002, RHB, 1 ♂ (FMP). **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF & JG, 1 ♂ (NMNH). **San Cristóbal**, 1/2 km E San Cristóbal, 8 Jun 1969, OSF & JG, 5 ♂ (NMNH).

Erythemis simplicicollis (Say 1839)

Although this species is very common over most of the eastern United States and southeastern Canada, it is rarely encountered on the Greater Antilles, only on Cuba, Jamaica and Hispaniola, with additional records from the Bahamas, Grand Cayman, Mexico, and Guatemala. From the Dominican Republic, it is only reported from Bahoruco, Barahona and Samaná. We have one specimen, recorded below, from Barahona, the basis for this provincial record.

New Record: **Barahona**, canals E. of Cabral, 18°15.16'N, 71°13.37'W, 16 May 1995, OSF, 1 ♂ (NMNH).

Erythemis vesiculosa (Fabricius 1775)

In contrast to the preceding species, this is very common across the Greater and Lesser Antilles, but less so across the

southern United States and the Great Plains and is distributed as far south as Paraguay. On the Dominican Republic it is recorded from La Altagracia, La Vega, Monte Cristi, and Santiago, and the Distrito Nacional. We have more records from La Vega, Monte Cristi, and the Distrito Nacional, with new provincial records from Azua, Barahona, El Seibo, Independencia, La Romana, Maria Trinidad Sánchez, Pedernales, and Puerto Plata.

New Records: **Azua**, Las Yayitas, Río Las Yayitas, UTM 316230 E, 2046941 N, 240 m, 15 Jan 2002, RHB, 1 ♂, 1 ♀ (FMP). **Barahona**, Vicinity Laguna Cabral, 55 m, 11 Dec 2003, DPG, RHB, BHG, RD-189, 1 ♀ (FMP); ca. 5 km S Cabral, dry forest, 18°11.27'N, 71°14.97'W, 411 m, 9 Apr 2004, DPG, RHB, BHG, RD-217, 2 ♀ (FMP). **Elías Piña**, Río Limpio, by river, 19°14.22'N, 71°31.99'W, 770 m, 25 Jul 2003, DPG, RHB, BHG, RD-163, 1 ♂ (FMP). **El Seibo**, near Laguna El Limón, 18°59.28'N, 68°52.29'W, 10 m, 18 Dec 2003, DPG, RHB, BHG, RD-204, 1 ♂, 5 ♀ (FMP). **Independencia**, Río Las Damas, ca. 1 km S Duvergé, Parque Nacional Sierra de Bahoruco, 18°22.28'N, 71°31.94'W, 5 Jul 2003, DPG, RHB, BHG, RD-141, 1 ♂, 1 ♀ (FMP). **La Romana**, Bayahibe, 31 Jul 2002, DPG, RHB, BHG, night collection, 1 ♂ (FMP). **María Trinidad Sánchez**, Reserva Científica Loma Guaconejo, Alto del Rancho, 170 m, 19°18.75'N, 69°56.66'W, 24–26 Jul 2002, RHB, 1 ♂, 2 ♀ (FMP); Nagua, entrance to the laboratory of Biology UASD, 21 Sep 2002, RHB, 1 ♀ (FMP); same but 9 May 2003, 1 ♂ (FMP). **Pedernales**, Oviedo, Parque Nacional Jaragua, Playa Blanca, 17°44.90'N, 71°31.17'W, 4 Dec 2002, RHB, 1 ♀ (FMP). **Puerto Plata**, Los Hidalgos, Cordillera Septentrional, 5 Jun 1969, OSF & JG, 2 ♂ (NMNH); Cabarete, P.N. El Choco, El Callejón de la Loma, 19°44.43'N, 70°25.46'W, 110 m, 13 Apr 2004, DPG, RHB, BHG, RD-220, 1 ♀ (FMP).

Erythrodiplax berenice (Drury 1770)

This is a coastal species, frequenting brackish or inland saline waters, found from the Maritime provinces of Canada south to northern South America. It is recorded, either as *E. berenice* or *E. berenice naeva*, from all the Greater Antillean islands and the Bahamas. It has been reported only from the Province of Pedernales, but there is an earlier report simply as Hispaniola (Paulson 1982). Our few examples, listed below, are all from Pedernales.

New Records: **Pedernales**, north of Lago Oviedo, 17°47.05'N, 71°22.45'W, 15 May 1995, OSF, 2 ♂ (NMNH); Oviedo, Parque Nacional Jaragua, Playa Blanca, 17°44.90'N, 71°31.17'W, 4 Dec 2002, RHB, 1 ♂ (FMP).

Erythrodiplax fervida (Erichson 1848)

This primarily Neotropical species has been taken on all the

Greater Antillean islands, and on the mainland from Mexico south to northern South America. There are records from Barahona, La Vega, Monseñor Nouel, Puerto Plata, San Cristóbal, and Samaná as well as the Distrito Nacional. We have additional material from Barahona, San Cristóbal, and the Distrito Nacional.

Erythrodiplax justiniana (Selys 1857)

This species is endemic to the Greater Antilles, being known from all the islands. It is recorded from La Vega, Samaná, San Cristóbal, and Santiago, as well as the Distrito Nacional. We have additional records from La Vega, Samaná, and San Cristóbal, and Distrito Nacional, in addition to new records from Azua, Barahona, and Peravia.

New Records: **Azua**, Padre Las Casas, Las Lagunas, Laguna Grande, 1033 m, 19°48.09'N, 70°52.84'W, 23 Nov 2002, DPG, BHG, HA, 1 ♂ (FMP). **Barahona**, spring run and marsh, Ojeda (S Paraiso), 5 m, 17°58.2'N, 71°10.6'W, 22 Mar 1999, OSF, 4 ♂ (NMNH); Vicinity Laguna Cabral, 55 m, 11 Dec 2003, DPG, RHB, BHG, RD-189, 5 ♀ (FMP). **Peravia**, Matadero, dry forest, 18°23.59'N, 70°25.03'W, 159 m, 14 Dec 2003, DPG, RHB, BHG, RD-197, 2 ♂ (FMP).

Erythrodiplax umbrata (Linnaeus 1758)

A wide ranging, and often common, species known from all the Greater and Lesser Antilles, the southern United States and south to Argentina. It has been reported from Azua, Barahona, Duarte, La Romana, La Vega, Monseñor Nouel, San Pedro de Macorís, Samaná and the Distrito Nacional. We have records from Barahona, La Vega, Monseñor Nouel, Samaná, San Pedro de Macorís, and the Distrito Nacional, as well the first records from El Seibo, Independencia, La Altagracia, María Trinidad Sánchez, Monte Cristi, Pedernales, Peravia, Puerto Plata, Sánchez Ramírez, Santiago, and Valverde.

New Records: **El Seibo**, near Laguna El Limón, 18°59.28'N, 68°52.29'W, 10 m, 18 Dec 2003, DPG, RHB, BHG, RD-204, 1 ♂, 6 ♀ (FMP); road Nisibón-Higüey, Río Yonu, 18°47.78'N, 68°40.03'W, 20 m, 19 Dec 2003, DPG, RHB, BHG, RD-205, 1 ♀ (FMP). **Independencia**, ca. 7 km on way to Caseta no.1, Parque Nacional Sierra de Bahoruco, 18°17.71'N, 71°34.34'N, 777 m, 3 Jul 2003, DPG, RHB, BHG, RD-135, 1 ♀ (FMP); ca. 5 km on way to Caseta no.1, Parque Nacional Sierra de Bahoruco, 18°18.30'N, 71°34.22'N, ca. 600 m, 11 Dec 2003, DPG, RHB, BHG, RD-190, 1 ♂ (FMP). **La Altagracia**, Nisibón, Finca Papagallo, beach, 18 Jun 1999, REW & RMB, 1 ♀ (FSCA). **María Trinidad Sánchez**, Reserva Científica Loma Guaconejo, Alto del Rancho, 170 m, 19°18.75'N, 69°56.66'W, 24–26 Jul 2002, RHB, 1 ♀ (FMP). **Monte Cristi**, 3 km before the town (from Navarrete), 0 m, UTM 224945 E, 2195362

N, 5 Feb 2002, RHB, 2 ♂, 1 ♀ (FMP); ca. 3 km E Monte Cristi, 19°49.66'N, 71°37.25'W, 11 Dec 2002, DPG, RHB, RD-090, 1 ♂, 1 ♀ (FMP); 4 km E Monte Cristi, 19°48.66'N, 71°37.25'W, 10 Dec 2002, DPG, RHB, RD-088, 1 ♂ (FMP); ca. 8 km E Monte Cristi, 19°49.93'N, 71°35.64'W, 10 Dec 2002, DPG, RHB, RD-089, 2 ♀ (FMP); ca. 4 km SE Monte Cristi, very dry forest, 19°19.66'N, 71°37.26'W, 23 Jul 2003, DPG, RHB, BHG, RD-160, 2 ♀ (FMP); Villa Vásquez, road to Buen Hombre, dry forest, 132 m, 19°46.21'N, 71°24.00'W, 6 Dec 2003, DPG, RHB, AM, RD-186, 1 ♂ (FMP). **Pedernales**, Pedernales, 10 m, 18°01.8'N, 71°44.7'W, 19 Mar 1999, OSF, 1 ♀ (NMNH); Oviedo, Parque Nacional Jaragua, Bucán de Tuí, 0 m, 17°43.95'N, 71°30.14'W, 4 Dec 2002, RHB, 1 ♀ (FMP). **Peravia**, Baní, 4 km from the entrance to Honduras, at the second bridge, 18°21.33'N, 70°25.91'W, 28 Jul 2002, DPG, RHB, 1 ♂ (FMP); Baní, Cerro Gordo, ca. 1 km from the exit of Baní-Salinas road, at the canal Marcos A. Cabral, ca. 170 m, 18°16.04'N, 70°20.63'W, 23 Nov 2003, DPG, RHB, RD-176, 1 ♀ (FMP); weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF & JG, 1 ♀ (NMNH). **Puerto Plata**, Los Hidalgos, Cordillera Septentrional, 5 Jun 1969, OSF & JG, 2 ♂, 1 ♀ (NMNH); Cabarete, P.N. El Choco, El Callejón de la Loma, 19°44.43'N, 70°25.46'W, 110 m, 13 Apr 2004, DPG, RHB, BHG, RD-220, 1 ♀ (FMP). **Sánchez Ramírez**, Mina Pueblo Viejo, ca. 20 m bridge over Río Maguaca (MG-3T), UTM 381279 E, 2096647 N, 2 Aug 2003, RHB, 1 ♀ (FMP); Mina Pueblo Viejo, Arroyo Rey, ca. 1 km N Club Taíno (PV-IT), shallow stream, muddy bottom, UTM 377063 E 2095641 N, 15 Aug 2003, RHB, 1 ♀ (FMP); Mina Pueblo Viejo, Arroyo Mejita (PV-2T), UTM 377059 E, 2094269 N, 16 Aug 2003, RHB, 2 ♀ (FMP). **Santiago**, San José de las Matas, road Inoa-El Caimito, mixed pine broadleaf forest, 19°12.23'N, 71°00.66'W, 552 m, 28 Apr 2004, DPG, RHB, BHG, RD-236, 1 ♂, 1 ♀ (FMP). **Valverde**, Cruce de Guayacanes, 5–6 Jun 1969, OSF & JG, 5 ♂, 5 ♀ (NMNH).

Idiataphe cubensis (Scudder 1866)

This is a species found around the Caribbean: the Greater Antilles, Florida and the Bahamas and Mexico to Costa Rica. It was reported for the first time from Hispaniola by Daigle (1996) based on material in the NMNH. However, full data was not given, therefore we provide it here, as well as present a second, earlier record of the species.

New Records: **Azua**, small pool and stream behind shore, Puerto Viejo, 1 m, 18°20.93'N, 70°50.35'W, 14 May 1995, OSF, 1 ♂ (NMNH). **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF & JG, 1 ♂ (NMNH).

Macrodiplax balteata (Hagen 1861)

The species ranges along the eastern coast of North America and into the southwest near saline habitats, and is found

on the Greater Antillean islands and south into northern South America. It has been recorded (Needham, Westfall & May 2000, Paulson 1982) from the Dominican Republic and Haiti, but without specific localities. We have not taken it, but record a collection that is in the FSCA.

New Record: **Pedernales**, Cabo Rojo, 18–28 Jun 1989, DM (FSCA).

Macrothemis celeno (Selys 1857)

The species is endemic to the Greater Antilles where it inhabits clear streams on all the islands. It has been recorded from Azua, Barahona, La Vega, Monseñor Nouel, Monte Cristi, Pedernales, San Cristóbal, Santiago, and the Distrito Nacional. We have material from Azua, Barahona, La Vega, Monseñor Nouel, Pedernales, San Cristóbal, and Santiago and can record it additionally from Dajabón, Elías Piña, Independencia, Peravia, Puerto Plata, Samaná, Sánchez Ramírez, San Juan, and Valverde.

New Records: **Dajabón**, 13 km S Loma de Cabrera, 20–24 May 1973, D & MD, 4 ♂, (NMNH); Loma de Cabrera, Río Massacre–Balneario El Salto, 20 May 1973, D & MD, 1 ♂ (NMNH). **Elías Piña**, Río Limpio, 781 m, 19°14.69'N, 71°31.99'W, 24–25 Jul 2003, DPG, RHB, BHG, RD-162, 5 ♂, 2 ♀ (FMP); Río Limpio, on way to Loma de las Tayotas, 844 m, 19°13.33'N, 71°31.22'W, 24 Jul 2003, DPG, RHB, BHG, RD-164, 1 ♂ (FMP). **Independencia**, La Descubierta, spring runs in town park, 0 m, 18°34.1'N, 71°43.8'W, 25 Mar 1999, OSF, 1 ♂ (NMNH); Río Las Damas, ca. 1 km S Duvergé, Parque Nacional Sierra de Bahoruco, 18°22.28'N, 71°31.94'W, 5 Jul 2003, DPG, RHB, BHG, RD-141, 2 ♂ (FMP); Río Las Damas, 2 km SSW Duvergé, 10 m, 18°24.0'N, 71°31.4'W, 24 Mar 1999, OSF, 2 ♂, 1 ♀ (NMNH); ca. 7 km on way to Caseta no. 1, Parque Nacional Sierra de Bahoruco, 18°17.71'N, 71°34.34'N, 777 m, 3 Jul 2003, DPG, RHB, BHG, RD-135, 1 ♀ (FMP); ca. 6 km NW of Cabral dry forest, 18°12.25'N, 71°14.40'N, 247 m, 13 Dec 2003, DPG, RHB, BHG, RD-195, 2 ♂ (FMP). **Peravia**, Baní, 9 km from the entrance at Honduras, road to Matadero, 18°23.46'N, 70°25.86'W, 27 Jul 2002, DPG, RHB, 2 ♂, 1 ♀ (FMP); Baní, Pueblo Nuevo, 97 m, 18°17.76'N, 70°19.60'W, 27 Jul 2002, DPG, RHB, 2 ♀ (FMP); Baní, Honduras, Matadero, vicinity of the aqueduct of the town, 28 Sep 2002, RHB, 6 ♂, 1 ♀ (FMP); Baní, Cerro Gordo, ca. 1 km from the exit of Baní-Salinas road, at the canal Marcos A. Cabral, ca. 170 m, 18°16.04'N, 70°20.63'W, 23 Nov 2003, DPG, RHB, RD-176, 1 ♀ (FMP); Matadero, dry forest, 18°23.59'N, 70°25.03'W, 159 m, 14 Dec 2003, DPG, RHB, BHG, RD-197, 1 ♂ (FMP). **Puerto Plata**, Los Hidalgos, Cordillera Septentrional, 5 Jun 1969, OSF & JG, 1 ♂ (NMNH); P.N. El Choco, ca. 8 km S Bombita, 19°43.25'N, 70°28.22'W, 144 m, 14 Apr 2004, DPG, RHB, BHG, RD-220, 1 ♂ (FMP).

Samaná, Samaná, [received 1916], Dr. Miller, 2 ♂ (NMNH). **Sánchez Ramírez**, Mina Pueblo Viejo, Maguaca (MG-2T), disturbed riverine forest, small stream, sandy bottom, UTM 379959 E 2094844 N, 23 Apr 2003, RHB, 1 ♀ (FMP); Mina Pueblo Viejo, Cotuí, Fátima (EL-1T), 3 Aug 2003, RHB, 1 ♂ (FMP); Mina Pueblo Viejo, Río Maguaca, Arroyo Cañada Honda (MG-1T), 2 Aug 2003, RHB, 1 ♂ (FMP). San Juan, 2 km E road to San Juan, 18°35.25'N, 70°58.09'W, 294 m, 20 Apr 2004, DPG, RHB, BHG, RD-229, 1 ♂, 1 ♀ (FMP); road San Juan-Vallejuelo, dry forest, 18°40.12'N, 71°18.45'W, 704 m, 21 Apr 2004, DPG, RHB, BHG, RD-233, 2 (FMP). **Valverde**, Ranchete, Cordillera Septentrional, 5 Jun 1969, OSF & JG, 2 ♂ (NMNH).

Miathyria marcella (Selys 1857)

This is a very widely distributed species (it drifts on the winds) found from the southern United States, south through all the Greater Antilles to Argentina. It has been recorded from La Vega and Monseñor Nouel and the Distrito Nacional in the Dominican Republic. We have an additional record from the Distrito Nacional and can add the Province of San Cristóbal.

New Record: **San Cristóbal**, 1/2 km E San Cristóbal, 8 Jun 1969, OSF & JG, 1 ♀ (NMNH).

Miathyria simplex (Rambur 1842)

The species has been taken on all the Greater Antillean islands and south from Mexico to Brazil. It is known from the Province of Puerto Plata and the Distrito Nacional in the Dominican Republic. We have not taken it in the country.

Micrathyria aequalis (Hagen 1861)

The species is widely distributed around the Caribbean, from Florida and Texas, through all the Greater Antilles, to Ecuador. The records from the Dominican Republic comprise the Provinces of Barahona, Monseñor Nouel, Peravia, and Samaná and the Distrito Nacional. We have taken it in Peravia and the Distrito Nacional.

Micrathyria didyma (Selys 1857)

This species has a distribution very similar to *M. aequalis*. It is known from El Seibo, La Vega, San Cristóbal, and Samaná. We have examples from La Vega and San Cristóbal and the basis for the El Seibo record.

Micrathyria dissocians Calvert 1906

This is a species almost limited to the Greater Antilles, but is known also from Mexico and Belize. It is recorded from La

Vega and San Cristóbal and the Distrito Nacional. We have additional material from the Distrito Nacional.

Micrathyria hagenii Kirby 1890

This species is distributed much as *M. aequalis*, but extends southwardly only to Costa Rica and is not found in Florida. In the Dominican Republic it is recorded from El Seibo, Samaná and the Distrito Nacional. We have not taken it on the island.

Orthemis species, *ferruginea* group

The concept of this species is currently very much in flux, especially so as it occurs on the Greater Antilles where there seems to be two color forms (perhaps species) to be found. It is quite possible that neither form is the true *ferruginea* (Donnelly 1995). Because of this confusion and that much of the old material probably can not now be separated into their true form, we list all records of this complex as *O. ferruginea* group. They have been recorded from Azua, Barahona, Duarte, Independencia, La Altagracia, La Romana, La Vega, Monseñor Nouel, Monte Cristi, Pedernales, Puerto Plata, Samaná, Sánchez Ramírez, San Pedro de Macorís, Santiago, and the Distrito Nacional. We have additional material from Azua, Barahona, Independencia, La Altagracia, La Vega, Monte Cristi, Pedernales, Puerto Plata, Samaná, Sánchez Ramírez, Santiago and the Distrito Nacional, and can add the provinces of Dajabón, Elías Piña, El Seibo, María Trinidad Sánchez, Peravia, San Cristóbal, San Juan, and Valverde.

New Records: **Dajabón**, Loma de Cabrera, Río Massacre – Balneario El Salto, 20–22 May 1973, D & MD, 1 ♂, 2 ♀ (NMNH); Loma de Cabrera, 24 May 1973, D & MD, 1 ♂ (NMNH); Loma de Cabrera, Río Massacre, 22 May 1973, D & MD, 1 ♂ (NMNH). **Elías Piña**, Río Limpio, 781 m, 19°14.69'N, 71°31.99'W, 24–25 Jul 2003, DPG, RHB, BHG, RD-162, 1 ♂, 1 ♀ (FMP); same, but by river, 770 m, 19°14.22'N, 71°31.99'W, 25 Jul 2003, 2 ♂, 1 ♀ (FMP). **El Seibo**, near Laguna El Limón, 18°59.28'N, 68°52.29'W, 10 m, 18 Dec 2003, DPG, RHB, BHG, RD-204, 3 ♂ (FMP). **María Trinidad Sánchez**, Reserva Científica Loma Guaconejo, Alto del Rancho, 170 m, 19°18.75'N, 69°56.66'W, 24–26 Jul 2002, RHB, 1 ♂, 2 ♀ (FMP); Reserva Científica Loma Guaconejo, path Alto del Rancho-Peonia, 26 Jul 2002, RHB, 1 ♂, 1 ♀ (FMP). **Peravia**, Baní, Pueblo Nuevo, 97 m, 18°17.76'N, 70°19.60'W, 27 Jul 2002, DPG, RHB, 2 ♂ (FMP). **San Cristóbal**, 1/2 km E San Cristóbal, 8 Jun 1969, OSF & JG, 1 ♀ (NMNH); La Toma, north of San Cristóbal, 9–10 Jun 1969, OSF & JG, 3 ♂ (NMNH); 5 km NE Villa Altagracia, dirt rd. off km 41 Carretera Duarte, 285 m, 18°42.86'N, 70°10.31'W, 12 Apr 2003, RHB, DPG, BHG, RD-130, 1 ♀ (FMP). **San Juan**, 2 km E road to San Juan,

18°35.25'N, 70°58.09'W, 294 m, 20 Apr 2004, DPG, RHB, BHG, RD-229, 1 ♀ (FMP). **Valverde**, ca. 2 km N Maizal, dry forest, 19°39.82'N, 70°58.42'W, 23 Jul 2003, DPG, RHB, BHG, RD-158, 1 ♂, 1 ♀ (FMP).

Pantala flavescens (Fabricius 1798)

This is the most widespread species of dragonfly in the world, being known from all of the New World, Africa, Asia, and most of the islands of the Pacific. In spite of this widespread distribution it has not been so widely reported in the Dominican Republic, only Duarte, La Vega, Puerto Plata, Sánchez Ramírez, Santiago and the Distrito Nacional. We have examples from La Vega, Santiago and the Distrito Nacional, and can now record the Provinces of Elías Piña, El Seibo, La Altagracia, La Romana, María Trinidad Sánchez, Monte Cristi, Pedernales, Samaná, and Valverde.

New Records: **Elías Piña**, Bánica, Cerro San Francisco de Asís, dry forest, 19°05.28'N, 71°41.10'W, 366 m, 21 Apr 2004, DPG, RHB, BHG, RD-234, 1 ♀ (FMP). **El Seibo**, near Laguna El Limón, 18°59.28'N, 68°52.29'W, 10 m, 18 Dec 2003, DPG, RHB, BHG, RD-204, 1 ♀ (FMP). **La Altagracia**, 15 km W of Higüey, disturbed site, 18°39.42'N, 68°51.13'W, ca. 100 m, 18 Dec 2003, DPG, RHB, BHG, RD-202, 1 ♂ (FMP). **La Romana**, 0.7 mi. W Higüey, 5 Sep 1963, AS (DRP). **María Trinidad Sánchez**, Reserva Científica Loma Guaconejo, Alto del Rancho, 170 m, 19°18.75'N, 69°56.66'W, 24–26 Jul 2002, RHB, 1 ♂ (FMP); Reserva Científica Loma Guaconejo, path Alto del Rancho-Peonia, 26 Jul 2002, RHB, 2 ♀ (FMP). **Monte Cristi**, 4 km E Monte Cristi, 19°48.66'N, 71°37.25'W, 10 Dec 2002, DPG, RHB, RD-088, 2 ♀ (FMP); ca. 4 km SE Monte Cristi, very dry forest, 19°19.66'N, 71°37.26'W, 23 Jul 2003, DPG, RHB, BHG, RD-160, 1 ♂, 2 ♀ (FMP). **Pedernales**, 150 m N of the bridge over road Cabo Rojo-Aceitillar, dry forest, 17°58.53'N, 71°39.03'W, 16 m, 7 Apr 2004, DPG, RHB, BHG, RD-217, 1 ♂ (FMP). **Samaná**, Samaná, [received 1916], Dr. Miller, 1 ♂, 1 ♀ (NMNH). **Valverde**, Cruce de Guayacanes, 5–6 Jun 1969, OSF & JG, 1 ♂ (NMNH).

Pantala hymenaea (Say 1839)

The species is reported from most all North, Central and South America, and the West Indies, although not from Jamaica and Puerto Rico. It is only reported from Hispaniola (Paulson 1982) or the Dominican Republic (Needham, Westfall & May 2000), but without specific locality. We have not taken the species on the island.

Perithemis domitia (Drury 1773)

This species is recorded from all the Greater Antillean islands, along the Mexican border in the southwestern United States,

and south to northern South America. The records from the Dominican Republic are from La Vega, Pedernales, San Cristóbal, Samaná, Santiago, and the Distrito Nacional. We also have examples from La Vega, Pedernales, and San Cristóbal, and have new records from Barahona, Dajabón, La Romana, Peravia, Puerto Plata, and Sánchez Ramírez.

New Records: **Barahona**, spring run and marsh, Ojeda (S Paraiso), 5 m, 17°58.2'N, 71°10.6'W, 22 Mar 1999, OSF, 2 ♂ (NMNH). **Dajabón**, Loma de Cabrera, Río Massacre–Bañero El Salto, 23 May 1973, D & MD, 3 ♂ (NMNH). **La Romana**, 0.7 mi. W Higüey, 5 Sep 1963, AS (DRP). **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF & JG, 1 ♀ (NMNH). **Puerto Plata**, Cabarete, P.N. El Choco, El Callejón de la Loma, 19°44.43'N, 70°25.46'W, 110 m, 13 Apr 2004, DPG, RHB, BHG, RD-220, 2 ♂ (FMP). **Sánchez Ramírez**, Mina Pueblo Viejo, Maguaca (MG-2T), disturbed riverine forest, small stream, sandy bottom, UTM 379959 E 2094844 N, 23 Apr 2003, RHB, 2 ♂ (FMP), same but 15 Apr 2003, 1 ♂.

Scapanea frontalis (Burmeister 1839)

This species and *Macrothemis celeno* are limited to the Greater Antilles and are both found on most fast-flowing, clean, rocky streams on the islands. It is known from Barahona, Duarte, La Vega, Monseñor Nouel, San Cristóbal, and Santiago and the Distrito Nacional. We have more examples from Barahona, La Vega, Monseñor Nouel, San Cristóbal, and Santiago, and can add Azua, Dajabón, Elías Piña, Independencia, Pedernales, Peravia, Puerto Plata, and San Juan.

New Records: **Azua**, Las Yayitas, in a contaminated stream, ca. 300 m, 18°30.19'N, 70°44.52'W, 8 Aug 2001, DPG, RHB, 2 ♂ (FMP); Peralta, Río Jura, 510 m, UTM 314905 E, 2054914 N, 16 Jan 2002, RHB, 1 ♂ (FMP). **Dajabón**, 13 km S Loma de Cabrera, 20 May 1973, D & MD, 1 ♂ (NMNH); Loma de Cabrera, 24 May 1973, D & MD, 1 ♂ (NMNH). **Elías Piña**, 4 km SE Río Limpio, 760 m, 24–25 May 1973, D & MD, 1 ♀ (NMNH); Río Limpio, grade up Loma La Tayota, 6 Feb 2002, (RHB?), 1 ♀ (FMP); Río Limpio, 781 m, 19°14.69'N, 71°31.99'W, 24–25 Jul 2003, DPG, RHB, BHG, RD-162, 1 ♂ (FMP). **Independencia**, La Descubierta, spring runs in town park, 0 m, 18°34.1'N, 71°43.8'W, 25 Mar 1999, OSF, 1 ♂ (NMNH). **Pedernales**, stream and cascade, 19 km N Pedernales, 230 m, 18°09.2'N, 71°44.8'W, 19 Mar 1999, OSF, 1 m, 1 ♀ (NMNH); Río Mulito, 21 km N Pedernales, 270 m, 18°09.3'N, 71°45.6'W, 18 Mar 1999, OSF, 1 ♂ (NMNH). **Peravia**, Baní, Honduras, Matadero, vicinity of the aqueduct to the town, 28 Sep 2002, RHB, 2 ♂ (FMP). **Puerto Plata**, Los Hidalgos, Cordillera Septentrional, 5 Jun 1969, OSF & JG, 1 ♂ (NMNH). **San Juan**, Las Matas, Arroyo Sabana, 18 Jun [year?], RDM, 1 ♂ (NMNH).

Sympetrum gilvum (Selys 1884)

The species *Sympetrum illotum* has long been considered to consist of three subspecies, *S. i. illotum*, *S. i. virgulum* and *S. i. gilvum*, with *gilvum* being recorded on the islands of Cuba, Hispaniola and Jamaica, and again in western North America. Recent studies (DeMarmels 2001, Tai 1967) have shown that *illotum* and *gilvum* are distinct species, with *virgulum* a form of *illotum*. *S. illotum* is distributed along the west coast of North America and Central America through, at least, Costa Rica. *S. gilvum* is found south of Panama throughout northern and western South America. The identity of the Antillean form has not been studied. Using the criteria of the denticles on the male cerci and the penis shape, all the males from Hispaniola available to us are unquestionably *S. gilvum*, not *S. illotum*. We do not have material from the other Antillean islands, and so cannot state which species are present on them, but would guess they are the same.

This is a high elevation species in the Antilles, being recorded only from the Province of La Vega in the Dominican Republic. We have many more records of the species in La Vega, and have also taken it in Azua and Barahona.

New Records: **Azua**, Las Yayitas, Río Las Yayitas, 240 m, UTM 316230 E, 2046941 N, 15 Jan 2002, RHB, 1 ♂ (FMP). **Barahona**, ponds at “La Lima” and “La Mina”, Cortico, Sierra Bahoruco, 1350 m & 1300 m, 18°06.8'N, 71°13.9'W & 18°06.7'N, 71°13.4'W, 23 Mar 1999, OSF, 7 ♂, 5 ♀ (NMNH); Monteada Nueva, Cortico, cloud forest, 18°06.39'N, 71°13.25'W, 1462 m, 10 Apr 2004, DPG, RHB, BHG, 3 ♂ (FMP).

Tauriphila australis (Hagen 1867)

The species has been found on Cuba, Hispaniola and Puerto Rico in the Antilles, Florida in the United States, and from Mexico south to Brazil. It is only reported from Hispaniola (Paulson 1982) or the Dominican Republic and Haiti (Needham, Westfall & May 2000), but without specific locality. We have a record from the Province of San Cristóbal.

New Record: **San Cristóbal**, 1/2 km E San Cristóbal, 8 Jun 1969, OSF & JG, 8 ♂ (NMNH).

Tholymis citrina Hagen 1867

The species infrequently collected but widely distributed in the New World, being reported from all the Greater Antillean islands, Florida and Texas in the United States, and from Mexico to Brazil. It normally flies only at dusk. It has been recorded from La Vega and Santiago and the Distrito Nacional in the Dominican Republic. We have not taken it.

Tramea abdominalis (Rambur 1842)

This wide-ranging species strays widely, and is recorded from all the Greater Antillean islands, Florida in the United States, and south from Mexico to Brazil. There are records from Azua, La Altagracia, La Vega, Monseñor Nouel, Puerto Plata, Samaná, and the Distrito Nacional. We have additional material from La Vega and the Distrito Nacional, and newly report it from Barahona, Peravia, Sánchez Ramírez, San Cristóbal, and present the first defined localities in Samaná.

New Records: **Barahona**, spring run and marsh, Ojeda (S Paraiso), 5 m, 17°58.2'N, 71°10.6'W, 22 Mar 1999, OSF, 4 ♂ (NMNH). **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF & JG, 2 ♂, 1 ♀ (NMNH). **Samaná**, Samaná, [received 1916], Dr. Miller, 1 ♂ (NMNH); La Laguna, 54 m, 19°15.01'N, 69°18.47'W, 28–29 Nov 2003, DPG, RHB, AF, RD-179, 1 ♂ (FMP). **Sánchez Ramírez**, Mina Pueblo Viejo, Loma Quemada, UTM 375230 E, 2094243 N, 15 Aug 2003, RHB, 1 ♂ (FMP). **San Cristóbal**, 1/2 km E San Cristóbal, 8 Jun 1969, OSF & JG, 2 ♂ (NMNH).

Tramea binotata (Rambur 1842)

This species is reported from all the Greater Antillean islands, Florida in the United States, and south to Brazil. From the Dominican Republic, it is reported in Monseñor Nouel and Samaná and the Distrito Nacional. We also have it from the Distrito Nacional, and can add La Vega.

New Record: **La Vega**, Río Yaqui del Norte, 3.5 km N Jaramacoa, 500 m, 15 Apr 1981, RW & JAG, 1 ♀ (RWG).

Tramea calverti Muttkowski 1910

The species is found on all the Greater Antillean islands, the eastern and southeastern United States, and south to Argentina. It is recorded under the above name, or as an misidentification, as *T. cophysa* from the Provinces of La Vega and Samaná. We newly report it from Azua, Monte Cristi and Peravia.

New Records: **Azua**, Monte Río, Monte Espinoso, 18°22.97'N, 70°43.04'W, 17 Nov 2002, RHB, 1 ♂ (FMP). **Monte Cristi**, 4 km E Monte Cristi, 19°48.66'N, 71°37.25'W, 10 Dec 2002, DPG, RHB, RD-088, 1 ♀ (FMP). **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF & JG, 2 ♂ (NMNH). Without Province, "Republica Dominicana, 15 Nov 1947, H. Allaud", 1 ♀ (NMNH).

Tramea insularis Hagen 1861

A species with a more restricted distribution than that of the

preceding, it is known from all Greater Antillean islands, and along the coast of the Gulf of Mexico and the Caribbean from Florida to northern South America. It has been recorded from Monseñor Nouel and Samaná and the Distrito Nacional. We have an additional record from the Distrito Nacional and can add the Province of Peravia.

New Record: **Peravia**, weedy ponds near Río Nizao, E Baní, 9 Jun 1969, OSF & JG, 1 ♂, 1 ♀ in tandem (NMNH).

Tramea onusta Hagen 1861

This species is widely distributed across the United States, on the Greater Antillean islands with the exception of Jamaica, and south to Panama. It is reported from Hispaniola (Paulson 1982) or the Dominican Republic (Needham, Westfall & May 2000), but without specific locality. We have not taken the species on the island, but Meurgey & Perron (2004) newly record it from the Province of Duarte.

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Species	Dominican Republic Provinces																			
	AL	AZ	BH	BR	CR	DA	DN	DU	EP	ES	HM	IN	JU	MC	MN	MP	MT	PM	PN	PP
ZYGOPTERA																				
COENAGRIONIDAE																				
<i>Diceratobasis melanogaster</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	x	-	-	-
<i>Enallagma civile</i>	-	-	-	x	-	-	•	-	-	-	-	-	-	x	-	-	x	-	•	-
<i>Enallagma coecum</i>	-	•	-	•	•	-	•	-	x	•	-	x	x	•	•	-	x	-	x	•
<i>Ischnura capreolus</i>	-	-	-	-	•	-	x	-	-	-	-	-	-	x	-	-	-	-	-	-
<i>Ischnura hastata</i>	-	-	-	x	x	-	x	-	-	-	-	-	-	x	•	-	-	-	-	-
<i>Ischnura ramburii</i>	-	•	-	•	x	-	x	-	x	-	-	x	-	x	•	-	-	-	-	-
<i>Leptobasis vacillans</i>	•	x	-	-	•	-	x	-	-	-	-	x	x	-	-	-	x	-	-	-
<i>Nehalennia minuta</i>	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Neocythrona cultallatum</i>	-	-	-	•	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-
<i>Telebasis dominicana</i>	•	x	-	•	•	-	•	-	-	-	-	x	•	-	-	-	-	-	•	•
<i>Telebasis vulnerata</i>	-	x	-	-	x	-	•	•	-	•	-	x	•	-	-	-	-	-	-	•
LESTIDAE																				
<i>Lestes forficula</i>	-	x	-	•	-	-	•	•	-	-	-	-	-	-	•	-	-	-	-	•
<i>Lestes scalaris</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-
<i>Lestes spumarius</i>	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	x	-	-	•	•
MEGAPODAGRIONIDAE																				
<i>Hypolestes trinitatis</i>	-	x	-	•	•	-	•	x	-	-	-	-	-	-	•	-	x	-	-	•
PROTONEURIDAE																				
<i>Protonera dunklei</i>	-	x	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	•
<i>Protonera sanguinipes</i>	-	-	-	-	-	•	•	-	-	-	-	-	-	-	-	-	x	-	-	-
<i>Protonera viridis</i>	-	-	-	-	•	-	•	-	-	-	-	-	-	-	-	-	-	-	•	•
SYNLESTIDAE																				
<i>Phyllestes ethelae</i>	-	-	-	-	-	-	-	-	x	-	-	-	-	-	•	-	-	-	-	•
ANISOPTERA																				
AESHNIDAE																				
<i>Anax amazili</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	•
<i>Anax concolor</i>	-	-	-	-	-	-	•	-	-	-	-	-	-	-	•	-	-	-	-	•
<i>Anax junius</i>	-	-	-	-	-	-	•	-	-	-	-	-	-	-	•	-	-	-	-	-
<i>Coryphaeschna adnexa</i>	-	-	-	x	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Coryphaeschna viriditas</i>	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	•
<i>Gynacantha nervosa</i>	-	-	-	-	x	-	•	-	-	-	-	-	-	-	-	-	-	-	-	•
<i>Rhionaeschna psilus</i>	-	-	-	x	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	•
<i>Triacanthagyna septima</i>	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-
<i>Triacanthagyna trifida</i>	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GOMPHIDAE																				
<i>Aphylla caraba</i>	-	-	-	-	•	-	•	-	-	-	-	-	-	-	•	-	-	-	-	•
<i>Progomphus integer</i>	-	-	-	-	•	-	•	-	-	-	-	-	-	-	-	-	-	-	-	•
<i>Progomphus serenus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•
<i>Progomphus tennesi</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•
<i>Progomphus zephyrus</i>	-	-	-	-	•	-	•	-	-	-	-	-	-	-	-	-	-	-	-	•

Previously recorded without specific locality

Species	AL	AZ	BH	BR	CR	DA	DN	DU	EP	ES	HM	IN	JU	MC	MN	MP	MT	PM	PN	PP	PR	RO	SC	SE	SM	SR	ST	SZ	VA	VE	
LIBELLULIDAE																															
<i>Brachymesia furcata</i>	-	-	-	•	-	-	X	-	-	-	-	-	-	-	•	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	
<i>Brachymesia herbida</i>	-	-	-	•	-	-	•	-	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	•	-	-	-	-	•	
<i>Cannaphila insularis</i>	-	-	-	•	•	-	-	-	-	-	X	-	-	-	•	-	-	-	-	•	-	-	-	-	•	-	-	-	-	•	
<i>Dythemis rufinervis</i>	-	-	-	•	X	X	•	•	X	-	-	-	X	-	-	-	-	-	X	-	X	-	-	•	X	-	•	X	X	•	
<i>Erythemis attala</i>	-	-	-	-	-	-	-	-	-	-	Previously recorded without specific locality																				
<i>Erythemis plebeja</i>	-	•	-	•	X	-	•	-	-	-	-	-	-	-	-	-	X	-	-	-	X	X	-	-	-	-	-	-	-	•	
<i>Erythemis simplicicollis</i>	-	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-	-	
<i>Erythemis vesiculosa</i>	X	X	-	X	-	-	•	-	-	-	-	X	-	•	•	-	X	-	X	-	-	X	-	X	-	-	•	-	-	•	
<i>Erythrodiplax berenice</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	
<i>Erythrodiplax fervida</i>	-	-	-	•	•	-	•	-	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	•	-	-	-	-	•	
<i>Erythrodiplax justiniana</i>	-	X	-	X	•	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	•	
<i>Erythrodiplax umbrata</i>	X	•	-	•	-	-	•	•	-	-	X	-	X	-	•	-	X	•	X	X	X	•	-	X	•	-	X	X	X	•	
<i>Idiataphe cubensis</i>	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	
<i>Macrodiplax balteata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	
<i>Macrothemis celeno</i>	-	•	-	•	•	X	•	-	X	-	-	X	X	•	•	-	-	-	•	X	X	-	-	-	X	-	•	X	X	•	
<i>Matthyria marcella</i>	-	-	-	-	X	-	•	-	-	-	-	-	-	•	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	•	
<i>Matthyria simplex</i>	-	-	-	•	-	-	•	-	-	-	-	-	-	-	•	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	
<i>Microthyria aequalis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-	-	•	-	-	•	-	-	-	-	-	•	
<i>Microthyria didyma</i>	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-	-	•	
<i>Microthyria dissocians</i>	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-	-	•	
<i>Microthyria hagenii</i>	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-	-	-	
<i>Orthemis ferruginea</i>	•	•	-	•	X	X	•	•	X	-	•	•	X	•	•	-	X	•	•	•	X	•	-	X	•	-	•	•	X	•	
<i>Pantala flavescens</i>	X	-	-	-	-	-	•	•	X	-	-	-	-	X	-	-	X	-	X	-	-	X	-	X	-	-	•	•	X	•	
<i>Pantala hymenaea</i>	-	-	-	-	-	-	-	-	-	-	Previously recorded without specific locality																				
<i>Perithemis domitia</i>	-	-	-	X	•	X	•	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	-	-	•	-	•	X	-	•	
<i>Scapania frontalis</i>	-	X	-	•	•	X	•	•	X	-	-	X	-	•	-	-	-	-	X	X	X	-	-	-	-	-	-	-	-	•	
<i>Sympetrum gilvum</i>	-	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Tauriphila australis</i>	-	-	-	-	X	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Thobymis citrina</i>	-	-	-	-	-	-	•	-	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	
<i>Tramea abdominalis</i>	•	•	-	X	X	-	•	-	-	-	-	-	-	-	•	-	-	-	-	•	X	-	-	-	•	-	-	X	-	•	
<i>Tramea binotata</i>	-	-	-	-	-	-	•	-	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	•	-	-	-	-	X	
<i>Tramea calverti</i>	-	X	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	•	-	-	-	-	•	
<i>Tramea insularis</i>	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	•	-	-	-	-	•	
<i>Tramea onusta</i>	-	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-	-	
Number of species/province	8	19	1	27	28	9	44	9	8	2	0	10	7	12	24	0	15	2	14	21	20	7	0	16	29	0	25	16	9	45	

AL = La Altagracia, **AZ** = Azua, **BH** = Bahoruco, **BR** = Barahona, **CR** = San Cristóbal, **DA** = Dajabón, **DN** = Distrito Nacional, **DU** = Duarte, **EP** = Elías Piña, **ES** = Espailat, **HM** = Hato Mayor, **IN** = Independencia, **JU** = San Juan, **MC** = Monte Cristi, **MN** = Monseñor Nouel, **MP** = Monte Plata, **MT** = María Trinidad Sánchez, **PM** = San Pedro de Macorís, **PN** = Pedernales, **PP** = Puerto Plata, **PR** = Peravia, **RO** = La Romana, **SC** = Salcedo, **SE** = El Seibo, **SM** = Samaná, **SR** = Santiago Rodríguez, **ST** = Santiago, **SZ** = Sánchez Ramírez, **VA** = Valverde, **VE** = La Vega.

• = Previous record; x = New provincial record, - = No record

Hind Wing Fragments Of *Meganeuropsis* (Protodonata: Meganeuridae) from the Lower Permian of Noble County, Oklahoma

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Abstract

Meganeurid Protodonata of the genera *Meganeura* (Carboniferous: Commentry, France) and *Meganeuropsis* (Permian: Wellington Formation, USA) are the largest insects known to have ever flown, with wing lengths equal to or greater than 300 mm. Specimens of such wings are relatively rare. A fragment of a 38 mm by 75 mm portion of the anal region of the hind wing of a *Meganeuropsis* griffenfly from the Wellington Formation of Noble County, Oklahoma, is figured and described.

Introduction

The largest insects known to have ever flown are the Paleozoic dragonfly-like meganeurids of the order Protodonata. The Protodonata, a Paleozoic stem group of the Odonata, differed in many respects from the Odonata: their wings had neither a pterostigma nor a nodus; males lacked secondary genitalia, and the females had very well developed ovipositors (Bechly et al. 2001). Because of this, Grimaldi and Engel (2005) suggested the Protodonata be known by the common name “griffenflies” rather than as dragonflies.

Wings of the Protodonata of the Wellington Formation of Kansas and Oklahoma (Lower Permian) ranged in length from 50 mm to 330 mm, with most species (6 of 10) having wings between 100 and 150 mm in length (Beckemeyer & Hall 2005). The only Protodonata with wing lengths of 300 mm or more (the “giant dragonflies” or “giant griffenflies”) are all in the family Meganeuridae.

The first of the giant Protodonata described was the Carboniferous *Meganeura monyi* (Brongniart 1884, 1885, 1893; Carpenter 1943), from the famous Commentry, France

deposits. It had an estimated wing length of 300 mm (Carpenter 1943), and is known from various fore wing and hind wing fragments.

In 1939, Carpenter described an even larger meganeurid, *Meganeuropsis permiana* from two wing fragments collected at the Elmo, Kansas (Dickinson County) fossil insect beds, one from a forewing and a second from a hind wing. He estimated the wing length of this insect to have been 330 mm. A few years later, Carpenter (1947) found a nearly complete and very large meganeurid wing from the Oklahoma Midco (Noble County) fossil beds (the Elmo and Midco beds are roughly contemporaneous, both occurring within the Lower Permian Wellington Formation exposures—Beckemeyer 2000). This wing was described by Carpenter as a second giant meganeurid species, *Meganeuropsis americana*, and he estimated the length of the complete wing to have been 305 mm. Figure 1 is a drawing, after that of Carpenter (1992), of the forewing of *Meganeuropsis americana*. (Grimaldi and Engel 2005, consider the two species names to be synonyms).

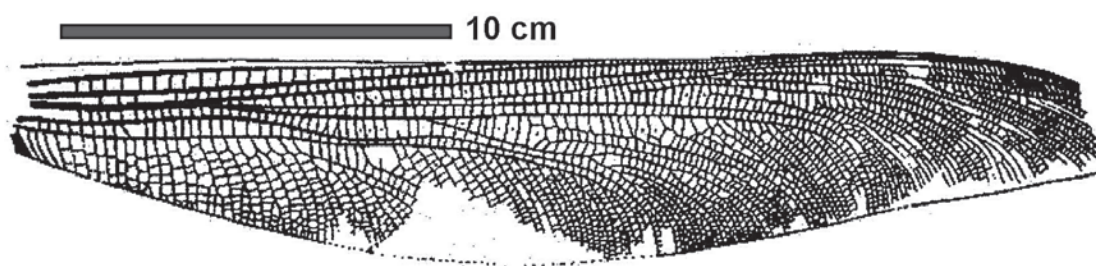


Fig. 1. Drawing of the venation of the forewing of Protodonata: Meganeuridae: *Meganeuropsis americana* Carpenter, 1947 (after Carpenter 1992). The complete wing would have measured 305 mm in length.

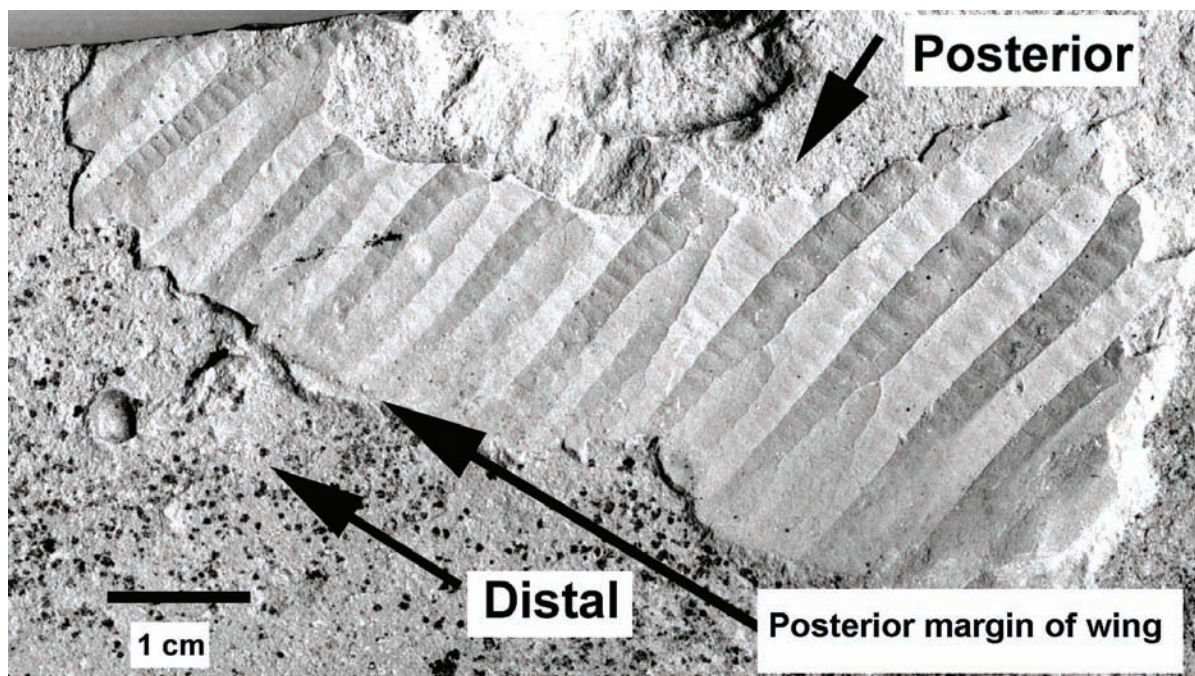


Fig. 2. Fragment of hind wing of *Meganeuropsis*. Specimen RJB2000-5a, Johnston Geology Museum. Impression of wing comprises a portion of the postero-basal (anal) part of the wing. Black scale bar is 1 cm in length. Short arrows indicate posterior and distal directions. Long arrow points to posterior margin of wing.

Material

In May 2000, I visited the Midco, Oklahoma fossil insect locality known as "Raasch's Station 9" (Raasch 1946). The site is located in Noble County (NE ¼, NE ¼, Section 33, Township 22N, Range 1W Indian Meridian: Bar ditch on east side of N-S road bounding section on east. Latitude: 36°20.7'N, Longitude: 97°18.0'W.) I collected material in situ as well as slabs that had weathered out and fallen into

the ditch. In one of the weathered slabs, I found a fragment of a meganeurid wing. There are three distinct insect fossil bearing layers at this locality, and the slab containing the fragments was from the middle layer.

The slab was quadrilateral in shape, about 9 by 14 cm and 2.5 to 3 cm thick. It separated along a bedding plane 20 mm from the bottom of the slab. The base of the slab (Fig. 2) remained intact and contains an irregular fragment of

wing that measures 75 mm in spanwise extent and 38 mm wide at the broadest portion (Part: RJB2000-5a). The counterpart (RJB200-5b, c, d, e, Fig. 3) broke into 4 pieces, the wing fragment on these measuring about 60 mm spanwise by 15 mm maximum width. The specimen is deposited in the Johnston Geology Museum at Emporia State University, Emporia, Kansas, 66801, Michael Morales, Director.

Discussion

In Figure 2 the veins are arched with their convex curvature

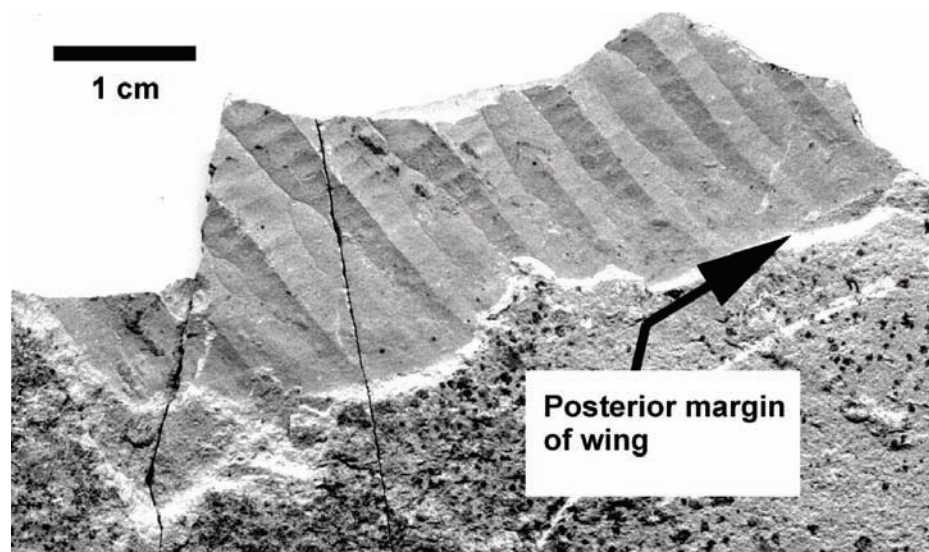


Figure 3. Fragments of hind wing of *Meganeuropsis*. Counterpart specimen RJB2000-5b, c, d, e, Johnston Geology Museum. Black scale bar is 1 cm in length. Arrow points to posterior margin of wing.

to the left. This indicates that the veins to the right are more basal than those to the left and that left is morphologically distal. We can also see a portion of the posterior margin of the wing (indicated by the long arrow). This and the branching pattern of the veins indicate that the bottom of the figure is morphologically posterior and the top of the picture the anterior direction.

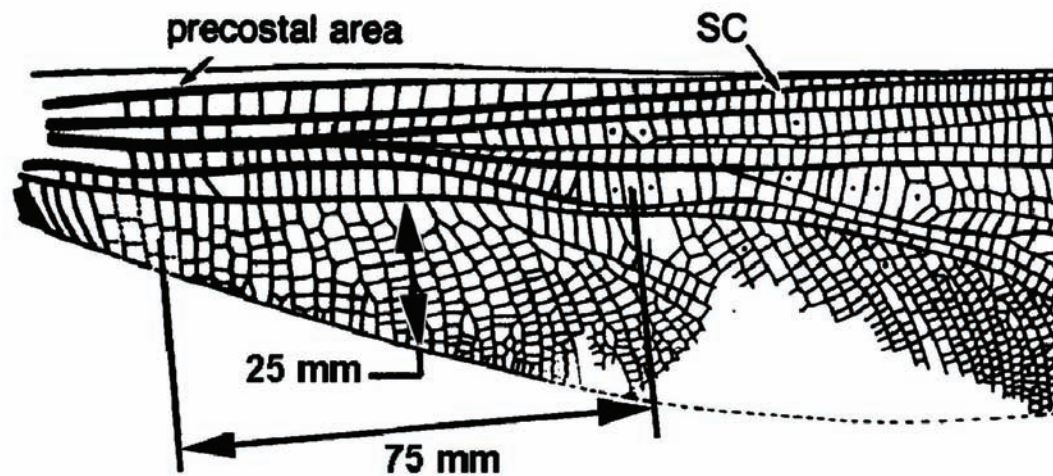


Figure 4. Drawing of the base of the forewing of Protodonata: Meganeuridae: *Meganeuropsis americana* Carpenter, 1947 (after Carpenter 1992). An arrow 75 mm long has been superimposed to scale on the anal region of the wing to illustrate the size of the fossil wing fragment. The average width of the anal region between the most posterior longitudinal vein (CuP) and the posterior wing margin is 25 mm for the forewing.

We can also observe that in Figure 1, the spacing of the chord-wise veins along the posterior margin of the wing is wider basally and becomes narrower distally. For the forewing of *M. americana*, the veins near the base of the wing are spaced at 7.2 mm from convex to convex vein. In the specimen, the spacing is 7.3 mm. This indicates that the fragment is likely from the basal or anal portion of the wing.

Figure 4 is a drawing of the basal portion of the forewing of *Meganeuropsis americana*. Superimposed on the anal region of the wing is an arrow depicting a 75 mm spanwise length that is comparable to the extent of the fossil specimen. The mean length (distance between the vein CuP and the trailing edge of the wing) of the chord-wise-running veins here is 25 mm. The corresponding length for the fossil fragment is 38 mm wide at the basal end. This is half again as long as the length of the corresponding veins of the forewing of *Meganueropsis americana*. Furthermore, there is no evidence on the fossil specimen of the longitudinal vein CuP, indicating that the veins between CuP and the trailing edge of the wing for the fossil specimen were greater than the 38 mm length that was preserved. There are no other fossil specimens of the basal portion of a *Meganeuropsis* wing, but in Figure 5 the bases of the forewing and hind wing of another large protodonate, *Tupus permianus* (drawing after Carpenter 1992), are compared. Here we see that the portion of the anal field of the hind wing posterior to CuP is as much as twice as wide as that of the forewing. If we assume the forewing and hind wing anal fields of *Meganeuropsis* wings to have been similarly related, we can conclude that our specimen appears to be from the anal region of the hind wing of a *Meganeuropsis* griffenfly. Of course, with no more of the wing than is represented by this fossil, we

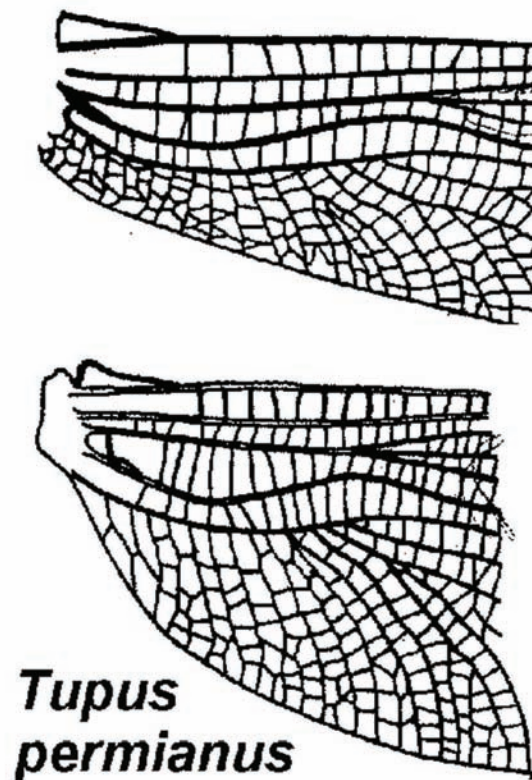


Figure 5. A comparison of the bases of the forewing and hind wing of Protodonata: Megatypidae: *Tupus permianus* (after Carpenter 1992). The anal region of the hind wing is roughly twice the breadth of that of the forewing.



Figure 6. The specimen of the fragment from the anal region of the hind wing of *Meganeuropsis* shown for comparison together with the wings and thorax of one of the largest extant Nearctic dragonflies, *Anax walsinghami*.

cannot attribute it definitively to species level, but the size is certainly consistent with it being from the wing of *M. americana*.

This specimen is the only known one comprising the anal region of the hind wing of a giant *Meganeuropsis*. The size of these insects can be in part appreciated by placing this fossil next to a large extant odonate. Figure 6 shows one of the largest Nearctic dragonflies, *Anax walsinghami*, lying next to our fragment of the hind wing of *Meganeuropsis*. Those who have experienced a fly-by of the Giant Darner can perhaps imagine being buzzed by a Giant Griffenfly!

Acknowledgements

Thanks to Michael Morales, Director of the Johnston Geology Museum, Emporia State University, for supporting my work with fossil insects.

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