

## HORSEFLIES (DIPTERA: TABANIDAE) FROM PROTECTED AREAS OF THE YUCATAN PENINSULA, MEXICO

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### ABSTRACT

Examination of horseflies deposited in the Colección Entomológica Regional of Universidad Autónoma de Yucatán Merida, Yucatan, Mexico (CER-UADY) and Instituto Nacional de Diagnóstico y Referencia Epidemiológicos, Mexico City, Mexico (INDRE) collections revealed a significant number of species and new localities from the Peninsula of Yucatan (PY). Previously published information is summarized, and new information about tabanid species reported for PY is presented, with emphasis on the most important protected areas within the biotic province of Yucatan: Celestun, Cuxtal, Dzilam and Ria Lagartos (Yucatan), Calakmul (Campeche), Sian Ka'an and El Eden (Quintana-Roo). Over 5,000 specimens collected by netting, human bait, Malaise traps and light traps were examined. A final list of 29 species, 17 representing state records and three representing PY records, is provided. One species is also reported for the first time from Mexico. Species diversity by state is as follows: Campeche, 19 species, 10 new state records; Quintana Roo, 23 species, 2 new state records; Yucatan, 22 species, 9 new state records. The 29 species reported for the biotic province of Yucatan represents more than 14% of the species known from Mexico. Most of these species have Neotropical or amphitropical affinities. Species showed wide distribution ranges within the biotic province of Yucatan, probably related to climatic and orographic homogeneity, which define the limits of the province.

Key words: Tabanidae, Peninsula of Yucatan, Mexico

### RESUMEN

Al revisar los tábanos depositados en las colecciones Colección Entomológica Regional of Universidad Autónoma de Yucatán Merida, Yucatan, Mexico (CER-UADY) e Instituto Nacional de Diagnóstico y Referencia Epidemiológicos, Mexico City, Mexico (INDRE), encontramos un número importante de especies y nuevos registros de localidades para la Península de Yucatán (PY). Compilamos y aportamos nueva información de tábanos reportados para la PY, con énfasis en las áreas protegidas más importantes ubicadas en la Provincia Biótica de Yucatán: Celestún, Cuxtal, Dzilam y Ria Lagartos (Yucatán), Calakmul (Campeche), Sian Ka'an y El Eden (Quintana Roo). Se revisaron 5,067 ejemplares recolectados con red entomológica, cebo humano, trampas Malaise y de luz. Incluyendo registros previos y nuevos, obtuvimos un listado final de 29 especies, 17 nuevos registros estatales y tres nuevos registros para la PY. Una especie es nuevo registro para México. La diversidad de especies por estado es la siguiente: Campeche (19 especies, 10 nuevos registros estatales); Quintana Roo (23 especies, 2 nuevos registros estatales); Yucatan (22 especies, 9 nuevos registros estatales). Las 29 especies reportadas para la Provincia biótica de Yucatán representan más del 14% de las especies conocidas para México. La mayoría de las especies tiene afinidad neotropical o anfítropical. Las especies mostraron un amplio rango de distribución dentro de la provincia biótica de Yucatán, probablemente relacionado con la homogeneidad climática y orográfica que define los límites de la provincia.

The family Tabanidae includes approximately 4,290 species worldwide, of which nearly one-third are Neotropical. In the most recent catalogue of Tabanidae south of the USA, 207 species were reported for Mexico, but only 14 species were specifically reported for one or more of the states included within the Peninsula of Yucatan (PY) (Fairchild & Burger 1994). However, it was considered quite possible that some of the 22 spe-

cies noted as widely distributed in Mexico (e.g., *Diachlorus ferrugatus*) might occur in PY.

Based on an extensive literature review, we recorded 25 species that had been specifically reported for PY from Townsend (1897) to Fairchild & Burger (1994): *Catachlorops fulmineus* var. *ocellatus* Enderlein, *Chlorotabanus mexicanus* (Linnaeus), *Chrysops auroguttatus* Kröber, *C. flavidus* Wiedemann, *C. pallidefemoratus* Kröber, *C. sca-*

*laratus* Bellardi, *C. variegatus* (De Geer), *Diachlorus ferrugatus* (Fabricius), *Esenbeckia illota* (Williston), *Leucotabanus canithorax* Fairchild, *L. exaestuans* (Linnaeus), *L. itzarum* (Bequaert), *Scione aurulans* (Wiedemann), *Stenotabanus indotatus* Ibáñez-Bernal, *S. jamaicensis* (Newstead), *S. littoreus* (Hine), *S. pechumani* Philip, *Tabanus campechianus* Townsend, *T. colombensis* Macquart, *T. commixtus* Walker, *T. haemagogus* Williston, *T. occidentalis* var. *dorsovittatus* Macquart, *T. oculus* Walker, *T. vittiger* ssp. *guatemalanus* Hine and *T. yucatanus* Townsend.

Furthermore, Ibáñez-Bernal & Coscarón (2000) reported (without specific names) 9 species for Campeche, 20 for Quintana Roo, and 10 for Yucatan. Our review found 9 species for Campeche, 22 for Quintana Roo, and 13 for Yucatan.

The only previous faunistic studies of the tabanid fauna within PY were a general list of Diptera for Sian Ka'an (Ibáñez-Bernal et al. 1990) and a detailed faunistic work of tabanids for this protected area (Ibáñez-Bernal 1992). These two papers listed 17 species (*Catachlorops fulmineus* var. *ocellatus*, *Chlorotabanus mexicanus*, *Chrysops flavidus*, *C. scalaratus*, *C. variegatus*, *Diachlorus ferrugatus*, *Leucotabanus canithorax*, *L. itzarum*, *Stenotabanus indotatus*, *S. jamaicensis*, *S. littoreus*, *Tabanus campechianus*, *T. colombensis*, *T. commixtus*, *T. occidentalis* var. *dorsovittatus*, *T. oculus* and *T. vittiger* ssp. *guatemalanus*). These 17 species, plus four unconfirmed records by Ibáñez-Bernal (*C. auroguttatus*, *E. illota*, *S. aurulans* and *T. yucatanus*) gives a total of 22 species for Quintana Roo. Only 10 of the species had been previously reported.

## MATERIALS AND METHODS

### Study Area

PY is situated in southeast Mexico and has a surface area of 142,523 km<sup>2</sup>. PY inland vegetation is tropical, mostly covered by short or medium sized dry deciduous forests, although there are some patches of high perennial forest. Coastal vegetation includes dunes, mangroves, marshes and petenes. The peten includes mangrove, short and medium sized deciduous forests and swamp vegetation elements. A more detailed description of dominant vegetation can be found in Flores & Espejel (1994). An interesting feature is the lack of surface running water, although there are some temporary ponds and cenotes (depressions in the karst landscape filled with groundwater) (Brenner et al. 1995).

PY includes the Mexican states of Campeche, Quintana Roo and Yucatan. PY includes two biotic provinces: biotic province of Yucatan (northern PY) and Peten (southern PY) (Barrera 1962; Alvarez & de Lachica 1991). The present report deals with the biotic province of Yucatan, de-

scribed as an area including low level carstic soils, without surface running water, situated in the north of PY up river from the mouths of the Champoton and Hondo rivers (Alvarez & de Lachica 1991).

More than 5,000 specimens deposited at CER and INDRE were examined. These specimens were collected by netting, human bait, Malaise traps and light traps. The authors and Adriana Godínez, Herón Huerta, Carmen Martínez, Leticia Miranda, Carlos Navarro, Rafael Paz, Crescencio Pérez, from INDRE and UADY collected the tabanids. Dr. Atilano Contreras and his team from Instituto de Biología UNAM, also provided specimens from Calakmul, Campeche.

All specimens were collected within seven protected areas (defined as terrestrial areas representing different ecosystems and their biodiversity under special governmental regime of protection conservation, restoration and development; SEMARNAP, 1996), Celestun, Cuxtal, Dzilam and Ria Lagartos (Yucatan), Calakmul (Campeche), Sian Ka'an and El Eden (Quintana-Roo) representing almost 10% of PY land area (Fig. 1). For details about species and collection localities of Sian Ka'an readers are referred to Ibáñez-Bernal (1992). There are few records from El Eden, but these were included because of their importance although it is clear that its tabanid diversity is poorly known. Other localities of the states were also included. Even though political borders do not have any biological meaning, they are useful to reference localities where species are recorded. The localities in PY are shown in Fig. 1.

## ABBREVIATIONS

INDRE = Instituto Nacional de Diagnóstico y Referencia Epidemiológicos; CER-UADY = Colección Entomológica Regional of Universidad Autónoma de Yucatán; CD = Coastal dune; DTF = Deciduous tropical forest; M = Mangrove; P = Peten; PY = Peninsula of Yucatan.

## RESULTS

Identification of 5,067 specimens provided a list of 23 species (Table 1) including 17 state records (see species accounts), and 3 records for PY (*Lepiselaga crassipes*, *Phaetotabanus longiapendiculatus*, *Tabanus pungens*). One species (*Chrysops varians*) is recorded for the first time from Mexico. Seventeen state records were confirmed and six species previously reported for PY (*Catachlorops fulmineus* var. *ocellatus*, *Chrysops auroguttatus*, *Esenbeckia illota*, *Scione aurulans*, *Stenotabanus indotatus* and *S. pechumani*) were not found in this study.

At present, including previous and new records, PY has the following tabanid species:

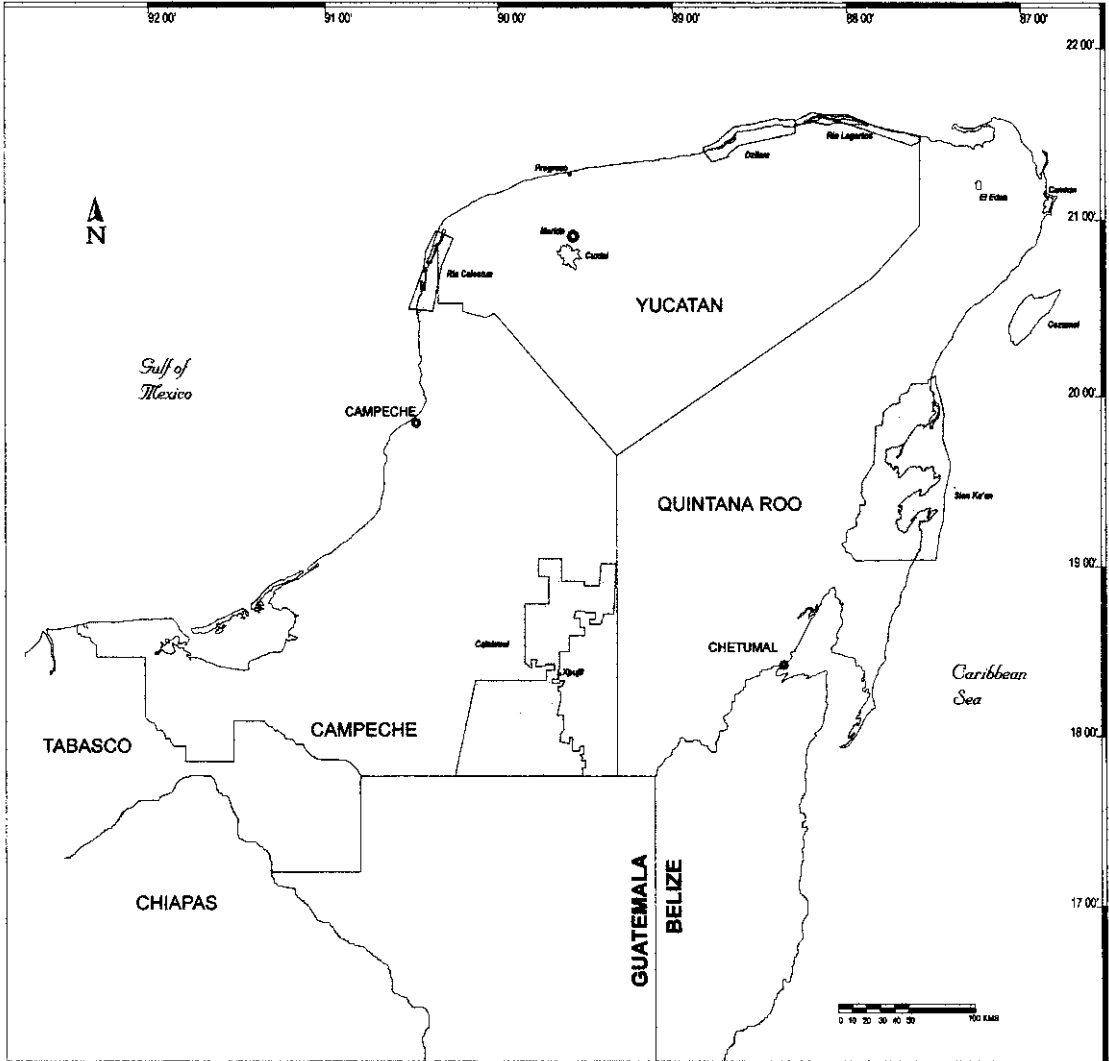


Fig. 1. Protected areas sampled in the Peninsula of Yucatan (redrawn from Bezaury et al. 1995). The map shows the borders of the states of Tabasco and Campeche and with the countries Guatemala and Belize.

Campeche: 19 species, including the following new state records: *Chrysops scalaratus*, *C. varians*, *C. variegatus*, *Lepiselaga crassipes*, *Leucotabanus canithorax*, *L. exaestuans*, *Tabanus colombensis*, *T. commixtus*, *T. occidentalis* var. *dorsovittatus* and *T. oculus*.

Quintana Roo: 23 species, including 2 new state records (*Lepiselaga crassipes* and *Tabanus haemagogus*).

Yucatan: 22 species, including the following new state records: *Chrysops flavidus*, *C. scalaratus*, *C. varians*, *Lepiselaga crassipes*, *Phaeotabanus longiappendiculatus*, *Tabanus campechianus*, *T. colombensis*, *T. occidentalis* var. *dorsovittatus* and *T. pungens*.

Annotated List of Tabanidae from Peninsula of Yucatan

Subfamily PANGONIINAE

Tribe Pangoniini

*Esenbeckia illota* (Williston), 1901

Known Distribution: From Mexico (Chiapas, Campeche, Nuevo Leon, Quintana Roo and Yucatan) to Belize and Honduras (Williston 1901; Bequaert 1931; 1933; Pearse 1945; Philip 1954a, 1978b; Fairchild & Burger 1994). Within PY, Philip (1978b) recorded one female from Campeche. Bequaert (1931) reported one female from Quintana Roo (cited as Territory of Quintana Roo) and Philip (1954a) reported the existence of specimens

TABLE 1. SPECIES OF TABANIDAE RECORDED IN PENINSULA OF YUCATAN, INCLUDING PREVIOUS AND NEW RECORDS FROM PROTECTED AREAS AND OTHER LOCALITIES. SYMBOLS: CA = CALAKMUL RESERVE; CE = CELESTUN RESERVE; CU = CUXTAL RESERVE; ED = EL EDEN RESERVE; DZ = DZILAM RESERVE; RL = RÍA LAGARTOS RESERVE; SK = SIAN KA'AN RESERVE; + = PRESENCE; (\*) = REPORTED BY IBÁÑEZ-BERNAL (1992).

Species	Campeche		Quintana Roo			Yucatan				
	CA	Others	ED	SK (*)	Others	CE	CU	DZ	RL	Others
<i>Catachlorops fulmineus</i> var. <i>ocellatus</i>				+						
<i>Chlorotabanus mexicanus</i>	+	+		+						
<i>Chrysops auroguttatus</i>					+					
<i>C. flavidus</i>				+		+		+	+	
<i>C. pallidefemoratus</i>	+	+		+	+		+		+	+
<i>C. scalaratus</i>	+			+		+			+	
<i>C. varians</i>	+								+	
<i>C. variegatus</i>	+			+		+		+	+	+
<i>Diachlorus ferrugatus</i>	+	+		+	+	+	+	+	+	+
<i>Esenbeckia illota</i>		+			+					+
<i>Lepiselaga crassipes</i>	+				+					+
<i>Leucotabanus canithorax</i>	+			+						
<i>L. exaestuans</i>	+					+				+
<i>L. itzarum</i>		+		+	+	+	+			+
<i>Phaetotabanus longiappendiculatus</i>						+				
<i>Scione aurulans</i>					+					
<i>Stenotabanus indotatus</i>				+						
<i>S. jamaicensis</i>				+					+	+
<i>S. littoreus</i>				+	+	+		+	+	+
<i>S. pechumani</i>		+								
<i>Tabanus campechianus</i>		+		+	+				+	+
<i>T. colombensis</i>		+		+		+	+	+	+	
<i>T. commixtus</i>	+		+	+	+	+	+	+	+	+
<i>T. haemagogus</i>			+			+	+		+	+
<i>T. occidentalis</i> var. <i>dorsovittatus</i>	+			+		+	+	+	+	
<i>T. oculus</i>	+	+		+	+	+	+		+	+
<i>T. pungens</i>						+			+	
<i>T. vittiger</i> ssp. <i>guatemalanus</i>		+		+		+		+	+	+
<i>T. yucatanus</i>		+			+	+				+

from Yucatan, without more detailed information. None of the reports for Campeche and Yucatan mentioned the collection date.

Tribe Scionini  
*Scione aurulans* (Wiedemann), 1830

Known Distribution: From Mexico (Chiapas, Oaxaca, Tabasco and Veracruz) to Guatemala, Belize, Honduras, Costa Rica and Colombia (Philip 1954a, 1978a; Fairchild & Burger 1994). This species was reported from PY (Bequaert 1931, 1933; Pearse 1945) for Quintana Roo (cited as Territory of Quintana Roo).

Subfamily CHRYSOPSINAE  
Tribe Chrysopsinae  
*Chrysops auroguttatus* Kröber, 1930

Known Distribution: From Mexico (Veracruz), to Costa Rica, Panama, northern Colombia and

Trinidad (Fairchild 1986; Fairchild & Burger 1994). Within PY this species was reported from an unknown locality in Quintana Roo (cited as southeast of Peto) by Bequaert (1931) (as *Chrysops incisa* Macquart, 1845). However, it was not found in our collections, nor was it collected by Ibáñez-Bernal (1992) in Quintana Roo. This species is very similar to *C. pallidefemoratus* and it is possible that the previous records were misidentifications.

*Chrysops flavidus* Wiedemann, 1821

This species is widely distributed from the southern USA to Mexico, as well in Cuba and Bahamas (Cruz & Garcia 1974; Fairchild & Burger 1994). It has been reported from the Mexican states of Hidalgo, Tabasco, Veracruz (Fairchild & Burger 1994) and Quintana Roo (Sian Ka'an) (Ibáñez-Bernal 1992). It is reported here for the first time in Yucatan, mainly from coastal areas

within coastal dune and mangrove, but also from a deciduous tropical forest close to the coast and petens.

Material Examined: YUCATAN, Celestun Reserve, 11 Celestun (CD), 4-XII-1995, 1 ♀ Eco-paraiso (CD), 10-IV-1997, 3 ♀ Rancho Loma Bonita (P), 7-IX-1995, 14 ♀ *Ibid.* 8-XII-1995, 1 ♀ Rancho Loma Bonita (DTF), 19-VII-1996, 2 ♀ *Ibid.* 5-IX-1995, 1 ♀ *Ibid.* 23-X-1996, 23 ♀ *Ibid.* 5-XII-1995; Dzilam Reserve, 2 ♀ Dzilam, 20-I-1993, net, 1 ♀ 2-II-1993, net; Ria Lagartos Reserve, 2 ♀ Rio Lagartos, 6-III-1994, Malaise trap, 1 ♀ El Cuyo, 23-V-1995, net, 1 ♀ EL Cuyo (M), 18-VII-1996, 1 ♀ *Ibid.* 28-XI-1997, 3 ♀ *Ibid.* 29-XI-1995, 13 ♀ Ojo de Agua (P), 8-VII-1996, 5 ♀ Peten Tucha, 31-XI-1995, 3 ♀ *Ibid.* 1-XII-1995, 4 ♀ Entrada a Sac-Bo (DTF), 9-VII-1996.

*Chrysops pallidifemoratus* Kröber, 1930

Known Distribution: From Trinidad, Belize and the three states of PY (Bequaert 1931, 1944; Fairchild 1942a; Fairchild 1971; Fairchild 1986; Ibáñez-Bernal 1992; Fairchild & Burger 1994).

Material examined: CAMPECHE, Calakmul Reserve, 3 Ejido Nuevo Becan, El Chorro, 30-V-1997, Malaise trap, 7 El Refugio, 2-I-1993, net. YUCATAN, Cuxtal Reserve, 9 Xmatkuil (DTF), 28-31-I-1994, Malaise trap, 3 Xmatkuil, 24-28-II-1994, Malaise trap; Ria Lagartos Reserve, 2 El Cuyo, 23-V-1995, net; Ria Lagartos Reserve, 1 Peten Tucha, 8-VII-1996, 1 La Darcena (CD), 10-VII-1997, 1 *Ibid.* 28-VIII-1995.

*Chrysops scalaratus* Bellardi, 1859

The type locality is Mexico. Known distribution from Panama to southern Mexico including the states of Chiapas, Quintana Roo (Sian Ka'an) and Veracruz (Ibáñez-Bernal 1992; Fairchild & Burger 1994). It is reported here for the first time for Campeche and Yucatan.

Material Examined: CAMPECHE, Calakmul Reserve, 1 archaeological zone, 3-V-1997, Malaise trap, 1 ♀ Ejido Nuevo Becan, El Chorro, 30-V-1997, Malaise trap. YUCATAN, Celestun Reserve, 9 ♀ Celestun (CD), 4-IX-1995, 58 ♀ Rancho Loma Bonita (P), 7-IX-1995, 10 ♀ 1 ♂ Rancho Loma Bonita (DTF), 20-I-1997, 233 ♀ *Ibid.* 5-IX-1995, 9 ♀ *Ibid.* 23-X-1996, 9 ♀ *Ibid.* 5-XII-1995; Ria Lagartos Reserve, 4 ♀ El Cuyo (CD) 23-V-1995 net, 4 ♀ *Ibid.* 5-V-1994 Malaise trap, 1 ♀ La Darcena, 13-I-1997, 1 ♀ Rio Lagartos, 6-III-1994, Malaise trap, 4 ♀ El Cuyo (M), 29-XI-1995, 1 ♀ San Felipe, 26-V-1995, Malaise trap, 2 ♀ Rio Lagartos (P), 4-IV-1997, Malaise trap, 1 ♀ Ojo de Agua (P), 27 ♀ 1 ♂ *Ibid.* 8-VII-1996, 1 ♀ *Ibid.* 31-VIII-1995, 17 ♀ 1 ♂ *Ibid.* 14-X-1996, 8 ♀ *Ibid.* 1-XII-1995, 17 ♀ Entrada a Sac-Bo (DTF), 21-I-1997, 2 ♀ *Ibid.* 1-IV-1997, 5 ♀ *Ibid.* 9-VII-1996, 1 ♀ *Ibid.* 9-VII-1997, 1 ♀ *Ibid.* 29-VIII-1995, 7 ♀

Peten Tucha, 7-VII-1997, 2 ♀ *Ibid.* 31-VIII-1995, 1 ♀ 1 ♂ *Ibid.* 1-IX-1995, 6 ♀ *Ibid.* 30-XI-1995.

*Chrysops varians* Weidemann, 1828

Known Distribution: Costa Rica, Panama, Colombia Venezuela, Guyana, Brazil, Ecuador, Peru, Paraguay, Argentina and Trinidad (Fairchild & Burger 1994). This is the first time that *C. varians* is reported for Mexico.

Material Examined: 8 ♀ MEXICO, YUCATAN, Ria Lagartos Reserve, El Cuyo, 23-V-1995, P. Manrique coll., net; 2 ♀ CAMPECHE, Calakmul Reserve, archaeological zone, 3-V-1997, Contreras, González, Ibarra and Martínez colls., Malaise trap.

*Chrysops variegatus* (De Geer), 1776

Known Distribution: Includes most of the Neotropics from Mexico to Argentina, as well as Cuba and the West Indies (Fairchild 1971, 1986; Cruz & Garcia 1974; Fairchild & Burger 1994). In Mexico, it has been reported from Jalisco, Tabasco, Quintana Roo (Sian Ka'an), Veracruz and Yucatan (Chichen Itza) (Bequaert 1931, 1933; Pearse 1945; Ibáñez-Bernal et al. 1990; Ibáñez-Bernal 1992). It is reported here for the first time for Campeche.

Material Examined: CAMPECHE, Calakmul Reserve, 10 ♀ archaeological zone, 3-V-1997, Malaise trap, 2 ♀ Ejido Nuevo Becan, El Chorro, 30-V-1997, Malaise trap, 2 ♀ El Refugio, 2-I-1993, net. YUCATAN, Celestun Reserve, 1 ♀ Rancho Loma Bonita (P), 26-III-1996, 2 ♀ *Ibid.* 8-VII-1996, 1 ♀ *Ibid.* 4-XII-1995, 1 ♀ Rancho Loma Bonita (DTF), 1 ♀ *Ibid.* 28-XI-1995, 1 ♀ *Ibid.* 5-XII-1995, Dzilam Reserve, 7 ♀ Dzilam, 2-2-1993, net; Ria Lagartos Reserve, 1 ♀ San Felipe, 26-5-1995, net, 2 ♀ Rio Lagartos, 6-III-1994, Malaise trap, 4 ♀ Ojo de Agua (P), 8-VII-1996, 1 ♀ Peten Tucha, 2-IX-1995, ♀ 1 *Ibid.* 15-X-1996, 1 ♀ *Ibid.* 30-XI-1995, 1 ♀ Entrada a Sac-Bo (DTF), 19-III-1996, 2 ♀ *Ibid.* 9-VII-1996, 2 ♀ *Ibid.* 9-VII-1997.

Subfamily TABANINAE

Tribe Diachlorini

*Stenotabanus indotatus* Ibáñez-Bernal, 1992

Described by Ibáñez-Bernal (1991) and reported (Ibáñez-Bernal 1992) for Quintana Roo (Sian Ka'an), Mexico. It is apparently confined to that area (Ibáñez-Bernal 1992; Fairchild & Burger 1994).

*Stenotabanus jamaicensis* (Newstead), 1909

Known Distribution: Jamaica, Cuba, Hispaniola, Puerto Rico, Cayman Islands and the Bahamas (Bequaert 1940; Philip 1958; Cruz & Garcia 1974). Its continental distribution is restricted to Mexico and Belize (Fairchild & Burger 1994).

Within PY it has been reported for Quintana Roo (Sian Ka'an) (Ibáñez-Bernal 1992) and Yucatan (Fairchild & Burger 1994).

Material Examined: YUCATAN, Ria Lagartos Reserve, 2 ♀ Rio Lagartos (CD), net.

*Stenotabanus littoreus* (Hine), 1907

Known Distribution: From Mexico to Panama (Fairchild 1953, 1971; 1986; Fairchild & Burger 1994). It has been previously reported in Mexico for Quintana Roo (Colonia Santa Maria and Sian Ka'an) (Bequaert 1931; Pearse 1945; Ibáñez-Bernal 1992) and Yucatan (Puerto Progreso) (Philip 1978a). Pearse (1945) erroneously cited Colonia Santa Maria, which is near to Puerto Morelos, as Puerto Morelos. The species is widely distributed along the coast of Quintana Roo and Yucatan.

Material Examined: YUCATAN, Celestun Reserve, 59 ♀ Celestun (CD), 4-IX-1995, 1 ♀ Dumac (M), 3-VII-1997, 7 ♀ *Ibid.* 6-IX-1995, 1 ♀ Rancho Loma Bonita (M), 8-VII-1996, 1 ♀ *Ibid.* 7-IX-1995, 2 ♀ Rancho Loma Bonita (DTF), 15-VII-1996, 1 ♀ *Ibid.* 5-IX-1995; Dzilam Reserve, 14 ♀ Dzilam, 15-VIII-1993, Malaise trap; Ria Lagartos Reserve, 1 ♀ El Cuyo (M), 8-VII-1997, 1 ♀ *Ibid.* 23-V-1995, 3 ♀ *Ibid.* 11-VII-1996, 2 ♀ La Darcena (DC), 10-VII-1997, 4 ♀ *Ibid.* 28-VIII-1995, 1 ♀ *Ibid.* 17-X-1996; 1 ♀ Ojo de Agua (P), 31-VIII-1995, 3 ♀ Peten Tucha, 8-VII-1996.

*Stenotabanus pechumani* Philip, 1966

Known Distribution: From Texas, USA to Mexico in the states of Veracruz and Campeche (Philip 1966; Fairchild & Burger 1994). We could not confirm its presence in PY.

*Catachlorops fulmineus* var. *ocellatus* Enderlein, 1925

Known Distribution: From Mexico to Colombia (Fairchild & Burger 1994). In Mexico, it has been collected in Chiapas, Tabasco and Veracruz (Fairchild 1940). Only one specimen has been collected in Quintana Roo (Sian Ka'an) (Ibáñez-Bernal 1992).

*Diachlorus ferrugatus* (Fabricius), 1805

Known Distribution: From the southern USA, Bahamas, Mexico and Central America as far south as Costa Rica (Fairchild 1971). In Mexico, it has been found in Tabasco and PY, in Campeche, Yucatan (Puerto Progreso) (Bequaert 1931; Pearse 1945) and Quintana Roo (Sian Ka'an and Cancun) (Ibáñez-Bernal 1992). This species is distributed around the Gulf of Mexico.

Material Examined: CAMPECHE, Calakmul Reserve, 14 ♀ archaeological zone, 3-V-1997, Malaise trap, 5 ♀ El Refugio, 2-I-1993, Malaise trap. QUINTANA ROO, 1 ♀ Vallehermoso, Rancho 3, 19-VII-1993, Malaise trap, 15 ♀ Vallehermoso,

24-VII-1993, Malaise trap. YUCATAN, Celestun Reserve, 1 ♀ Celestun (CD), 15-I-1997, Malaise trap, 19 ♀ Peten, 8-9-IV-1997, Malaise trap, 6 ♀ Peten, 1-VII-1997, Malaise trap; 1 ♀ Celestun (CD), 3-VII-1997, 1 ♀ *Ibid.* 4-IX-1995, 2 ♀ *Ibid.* 8-XII-1995, 3 ♀ Dumac (M), 28-III-1996, 3 ♀ *Ibid.* 4-VII-1997, 4 ♀ *Ibid.* 6-IX-1995, 1 ♀ 1 ♂ *Ibid.* 16-X-1996, 96 ♀ 6 ♂ Ecoparaiso (CD), 21-I-1997, 4 ♀ *Ibid.* 10-IV-1997, 15 ♀ *Ibid.* 17-VII-1996, 3 ♀ Peten 2, 20-I-1997, 16 ♀ *Ibid.* 8-IV-1997, 53 ♀ *Ibid.* 30-VI-1997, 234 ♀ 6 ♂ Rancho Loma Bonita (P), 25-III-1996, 16 ♀ *Ibid.* 16-VII-1996, 67 ♀ *Ibid.* 7-IX-1995, 13 ♀ *Ibid.* 24-X-1996, 23 ♀ *Ibid.* 4-XII-1995, 163 ♀ Rancho Loma Bonita (DTF), 26-III-1996, 71 ♀ *Ibid.* 1-IV-1997, 162 ♀ *Ibid.* 16-VII-1996, 22 ♀ *Ibid.* 5-IX-1995, 28 ♀ 1 ♂ *Ibid.* 23-X-1996, 47 ♀ *Ibid.* 5-XII-1995; Cuxtal Reserve, 1 ♀ Dzununcan (DTF), 8-IV-1993, net, 5 ♀ Xmatkuil (DTF), 17-I-1996, net; Dzilam Reserve, 5 ♀ Dzilam, 5-V-1993, net; Ria Lagartos Reserve, 74 ♀ Rio Lagartos, Peten 4, 7-VII-1997, Malaise trap, 1 ♀ El Cuyo, 5-V-1994, Malaise trap, 1 ♀ El Cuyo, 23-V-1995, Malaise trap, 2 ♀ San Felipe, 26-V-1995, net, 7 ♀ Ojo de Agua (P), 21-III-1996, 39 ♀ *Ibid.* 8-IV-1997, 2 ♀ *Ibid.* 30-VI-1997, 348 ♀ 4 ♂ *Ibid.* 8-VII-1996, 2 ♀ 3 ♂ *Ibid.* 31-VIII-1995, 5 ♀ *Ibid.* 14-X-1996, 4 ♀ *Ibid.* 30-XI-1995, 1 ♀ *Ibid.* 1-XII-1995, 111 ♀ Peten Tucha, 16-I-1997, 32 ♀ *Ibid.* 4-IV-1997, 179 ♀ *Ibid.* 8-VII-1996, 4 ♀ 1 ♂ *Ibid.* 1-IX-1995, 12 ♀ *Ibid.* 30-XI-1995, 25 ♀ *Ibid.* 1-XII-1995, 7 ♀ Camino a Nuevo Tekal (DTF), 9-VII-1997, 1 ♀ Entrada a Sac-Bo (DTF), 13-I-1997, 3 ♀ *Ibid.* 19-III-1996, 94 ♀ *Ibid.* 1-IV-1997, 32 ♀ 1 ♂ *Ibid.* 9-VII-1996, 1 ♀ *Ibid.* 29-VIII-1995, 1 ♀ *Ibid.* 5-IX-1995, 1 ♀ *Ibid.* 15-X-1996, 2 ♀ *Ibid.* 28-XI-1995, 1 ♀ La Darcena (CD), 13-I-1997.

*Chlorotabanus mexicanus* (Linnaeus), 1758

Known Distribution: From southern Mexico to northern Brazil (Fairchild and Burger 1994). According to Fairchild (1986) and Ibáñez-Bernal (1992), it has been found in Campeche, Chiapas, Quintana Roo (Sian Ka'an) and Veracruz. This species has been reported from rain forest areas, which probably restricts its distribution in PY to a few southern areas.

Material Examined: CAMPECHE, Calakmul Reserve, 9 ♀ archaeological zone, 3-V-1997, Malaise trap, 1 ♀ El Refugio, 2-I-1993, light trap.

*Phaetotabanus longiappendiculatus* Macquart, 1855

Known Distribution: From Mexico to Panama. The first report for Mexico was Bellardi (1859) (as *Tabanus luteoflavus* Bellardi 1859) and the last was Townsend (1897) (as *Tabanus limonus* var. *mexicanus* Townsend 1897). It is reported here for the first time for PY and Yucatan State.

Material Examined: YUCATAN, Celestun Reserve, 1 ♀ Rancho Loma Bonita (P), 7-IX-1995,

Malaise trap, 2 Entrada a Sac-Bo (DTF), 9-VII-1996, Malaise trap, 4 *Ibid.* 15-X-1996.

*Catachlorops fulmineus* var. *ocellatus* Enderlein, 1925

Known Distribution: From Mexico to Colombia (Fairchild & Burger 1994). In Mexico, has been collected in Chiapas, Tabasco and Veracruz (Fairchild 1940). Only one specimen has been collected from PY in Quintana Roo (Sian Ka'an) (Ibáñez-Bernal 1992).

*Leucotabanus canithorax* Fairchild, 1941

This species has been reported from Colombia, Trinidad, Guyana, Panama and Belize (Fairchild 1985; Fairchild and Burger 1994). In Mexico, it has been reported from Chiapas (Fairchild 1985) and Quintana Roo (Sian Ka'an) (Ibáñez-Bernal 1992; Fairchild & Burger 1994). It is reported here for the first time for Campeche.

Material Examined: CAMPECHE, Calakmul Reserve, 1 ♀ archaeological zone, 3-V-1997, Malaise trap.

*Leucotabanus exaestuans* (Linnaeus), 1758

According to Fairchild (1986) and Fairchild & Burger (1994), the range of this species appears to cover the entire Neotropics, from Mexico to Argentina, and Trinidad. This species was reported from Yucatan (Chichen Itza) by Bequaert (Bequaert 1931, 1933; Pearse 1945) (as *Tabanus leucaspis* Wiedemann, 1928). It is reported here for the first time for Campeche.

Material Examined: CAMPECHE, Calakmul Reserve, 1 ♀ El Refugio, 2-IX-1993, Malaise trap. YUCATAN, Reserva de Celestun, 1 ♀ Celestun (P), 30-VI-1997, Malaise trap.

*Leucotabanus itzarum* (Bequaert), 1831

This is apparently an endemic species for Mexico, specifically PY (Fairchild and Burger 1994). The species has been reported in all the states of PY (Bequaert 1931, 1933; Pearse 1945; Fairchild 1971; Fairchild 1985; Ibáñez-Bernal 1992; Fairchild & Burger 1994). It seems to be restricted to deciduous tropical forests.

Material Examined: YUCATAN, Celestun Reserve, 1 ♀ Rancho Loma Bonita (DTF), 15-VII-1996; Cuxtal Reserve, 1 ♀ Tunkas, 19-I-1996, net, 11 ♀ Xmatkuil (DTF), 8-10-VI-1994, Malaise trap, Xmatkuil (DTF), 1 ♀ 10-17-III-1997, Malaise trap, 7 ♀ *Ibid.* 6-12-V-1997, 11 ♀ *Ibid.* 13-20-V-1997, 5 ♀ *Ibid.* 20-28-V-1997, 4 ♀ *Ibid.* 18-22-VI-1996, 7 ♀ *Ibid.* 28-V-2-VI-1997, 43 ♀ *Ibid.* 4-8-VI-1996, 6 ♀ *Ibid.* 10-VI-1997, 15 ♀ *Ibid.* 16-VI-1996, 46 ♀ *Ibid.* 18-28-VI-1996, 1 ♀ *Ibid.* 18-VI-5-VII-1996, 3 ♀ *Ibid.* 24-VI-1-VII-1997, 1 ♀ *Ibid.* 26-VI-5-VII-1996, 9 ♀ *Ibid.* 1-24-VII-1997, 1 ♀

*Ibid.* 5-16-VII-1996, 2 ♀ *Ibid.* 29-VII-1996, 1 ♀ *Ibid.* 29-IX-4-X-1996, 1 ♀ *Ibid.* 28-X-4-XI-1996.

*Lepiselaga crassipes* (Fabricius), 1805

Widely distributed south American species that occurs from southern Mexico to northern Argentina and Cuba, Jamaica, Hispaniola, Puerto Rico (Fairchild 1942b; 1986; Cruz and Garcia 1974; Fairchild and Burger 1994). It was collected in Campeche, Quintana Roo and Yucatan, the first specific record for PY, and its three states. All localities are disturbed areas.

Material Examined: CAMPECHE, Calakmul Reserve, 1 ♀ El Refugio, 2-IX-1993, Malaise trap. QUINTANA ROO, 4 ♀ Vallehermoso, 24-VII-1993, Malaise trap. YUCATAN, 1 ♀ Rancho Hobonil, 10-V-1995, Malaise trap.

Tribe Tabanini

*Tabanus campechianus* Townsend, 1897

Known Distribution: Mexico to Belize (Fairchild & Burger 1994). In Mexico it has been reported from Campeche (as between Campeche and Esperanza, 48 mi. N Puerto Real and Campeche) (Townsend 1897; Bequaert 1931; Pearse 1945; Fairchild 1978) and Quintana Roo (Cancun and Sian Ka'an) (Fairchild 1978; Ibáñez-Bernal 1992). It is reported here for the first time for Yucatan. It seems to be widely distributed in the coastal areas of PY, although at very low densities.

Material Examined: YUCATAN, Celestun Reserve, 1 ♀ Ecoparaiso (M), 16-X-1996, Malaise trap, 1 ♀ Rancho Loma Bonita (P), 25-III-1996, 1 ♀ Rancho Loma Bonita (DTF), 23-X-1996; Ria Lagartos Reserve, 15 ♀ Ojo de Agua (P), 31-VIII-1995, Malaise trap, 1 ♀ Rio Lagartos, Peten Tucha, 28-XI-1995, Malaise trap, 1 ♀ El Cuyo (M), 1 ♀ *Ibid.* 5-V-1994, Malaise trap, 11-VII-1996, Malaise trap, 6 ♀ *Ibid.* 30-VIII-1995, 2 ♀ *idem* 16-X-1996, 1 ♀ *Ibid.* 28-XI-1995, 5 ♀ San Felipe, 26-V-1995, net; 1 ♀ Chuburna Puerto (CD), 15-V-1995, net, 1 ♀ *Ibid.* 15-IV-1995.

*Tabanus colombensis* Macquart, 1846

Known Distribution: Texas, USA to Brazil and Trinidad (Fairchild & Burger 1994). In Mexico it has been reported for Veracruz (Misantla) (Williston 1901) and for PY only in Quintana Roo (Sian Ka'an) (Ibáñez-Bernal 1992). It is reported here for the first time for Campeche and Yucatan.

Material Examined: CAMPECHE, 1 ♀ Libertad, 24-VI-1993, net. YUCATAN, Celestun Reserve, 1 ♀ Celestun (CD), 23-I-1997, 6 ♀ *Ibid.* 27-III-1996, 6 ♀ *Ibid.* 4-IX-1995, 2 ♀ *Ibid.* 4-XII-1995, 4 ♀ Dumac (M), 28-III-1996, 1 ♀ *Ibid.* 3-VII-1997, 3 ♀ Ecoparaiso (CD), 21-I-1997, 2 ♀ *Ibid.* 17-VII-1996, 6 ♀ *Ibid.* 26-X-1996, 1 ♀ *Ibid.* 7-XII-1995, 1 ♀ Ecoparaiso (M), 9-IV-1997, 6 ♀

*Ibid.* 18-VII-1996, 1 ♀ Celestun (P), 20-I-1997, 2 ♀ *Ibid.* 30-VI-1997, 16 ♀ Rancho Loma Bonita (P), 23-VI-1996, 11 ♀ *Ibid.* 7-IX-1995, 9 ♀ Rancho Loma Bonita (DTF), 26-III-1996, 1 ♀ *Ibid.* 7-IV-1997, 18 ♀ *Ibid.* 16-VII-1996, 4 ♀ *Ibid.* 5-IX-1995, 2 *Ibid.* 23-X-1996, 10 ♀ *Ibid.* 5-XII-1995; Cuxtal Reserve, 1 ♀ Xmatkuil, 24-28-II-1994, Malaise trap; Dzilam Reserve, 1 ♀ Dzilam, 5-V-1993, net; Ria Lagartos Reserve, 2 ♀ Ojo de Agua (P), 16-I-1997, 1 ♀ *Ibid.* 21-III-1996, 3 ♀ *Ibid.* 7-VII-1997, 20 ♀ *Ibid.* 31-VIII-1995, 1 ♀ *Ibid.* 4-IX-1995, 2 ♀ *Ibid.* 14-X-1996, 1 ♀ *Ibid.* 30-XI-1995, 3 ♀ *Ibid.* 1-XII-1995, 3 ♀ Peten Tucha, 4-IV-1997, 3 ♀ *Ibid.* 8-VII-1996, 2 ♀ *Ibid.* 1-IX-1995, 1 ♀ El Cuyo (M), 14-I-1997, 2 ♀ *Ibid.* 20-III-1996, 2 ♀ *Ibid.* 11-VIII-1997, 3 ♀ *Ibid.* 16-X-1996, 1 ♀ *Ibid.* 28-XI-1995, 1 ♀ Entrada a Sac-Bo (DTF), 19-III-1996, 2 ♀ *Ibid.* 9-VII-1997, 1 ♀ *Ibid.* 29-VIII-1995, 2 ♀ *Ibid.* 15-X-1996, 2 ♀ La Darcena (DC), 18-III-1996, ♀ 1 *Ibid.* 28-VIII-1995, 3 ♀ *Ibid.* 17-X-1996.

*Tabanus commixtus* Walker, 1860

Known Distribution: southern Mexico to Venezuela, Hispaniola, Trinidad and Martinique (Fairchild 1983; Fairchild & Burger 1994). This species has been reported for PY in Yucatan (Chichen Itza) (as *T. maya* Bequaert 1931) (Bequaert 1931, 1933; Pearse 1945) and for Quintana Roo (Sian Ka'an) (Ibáñez-Bernal 1992). It is reported here for the first time for Campeche.

Material Examined: CAMPECHE, Calakmul Reserve, 1 ♀ archaeological zone, 3-V-1997, Malaise trap, 1340 ♀ *Ibid.* 3-V-1997, 6 ♀ Ejido Nuevo Becan, El Chorro, 30-IV-1997, Malaise trap, 1 ♀ El Refugio, 2-I-1993, Malaise trap; 3 ♀ La Libertad, 24-VI-1993. QUINTANA ROO, El Eden Reserve, 1 ♀ El Eden, 18-III-1996, net; 2 ♀ Vallehermoso, 21-24-VII-1993, Malaise trap. YUCATAN, Celestun Reserve, 16 ♀ Celestun (CD), 27-III-1996, 3 ♀ *Ibid.* 4-IX-1995, 59 ♀ *Ibid.* 7-XII-1995, 3 ♀ Dumac (M), 22-I-1997, 24 ♀ *Ibid.* 28-III-1996, 1 ♀ *Ibid.* 6-IX-1995, 19 ♀ *Ibid.* 6-XII-1995, 2 ♀ Ecoparaiso (CD), 21-I-1997, 2 ♀ *Ibid.* 26-X-1996, 13 ♀ Rancho Loma Bonita (P), 25-III-1996, 12 ♀ *Ibid.* 7-IX-1995, 4 ♀ *Ibid.* 4-XII-1995, 38 ♀ Rancho Loma Bonita (DTF), 26-III-1996, 12 ♀ *Ibid.* 16-VII-1996, 8 ♀ *Ibid.* 5-IX-1995, 1 ♀ *Ibid.* 23-X-1996, 102 ♀ *Ibid.* 5-XII-1995; Dzilam Reserve, 2 ♀ Dzilam, 20-I-1993, 1 ♀ *Ibid.* 2-II-1993, 14 ♀ *Ibid.* 5-V-1993; Cuxtal Reserve, 1 ♀ Xmatkuil (DTF), 4-10-III-1997, Malaise trap, 1 *Ibid.* 10-17-III-1997, 2 ♀ *Ibid.* 24-31-III-1997, 6 ♀ *Ibid.* 6-12-V-1997, 3 ♀ *Ibid.* 13-20-V-1996, 4 ♀ *Ibid.* 20-28-V-1997, 1 ♀ *Ibid.* 28-V-2-VI-1997, 12 ♀ *Ibid.* 4-8-VI-1996, 4 ♀ *Ibid.* 8-10-VI-1994, 9 ♀ *Ibid.* 18-22-VI-1996, 1 ♀ *Ibid.* 18-28-VI-1996; 6 ♀ Mocochoa, 4-11-XI-1993, Malaise trap; 2 ♀ Muna, 27-IV-1995, net; Ria Lagartos Reserve, 3 ♀ El Cuyo (M), 5-V-1994, Malaise trap, 3 ♀ *Ibid.* 5-VI-1994, 1 ♀ *Ibid.* 11-VII-1996, 10 ♀ 1 ♂ *Ibid.* 29-XI-1995, 8 ♀ Entrada a Sac-Bo (DTF), 19-III-1996, 1 ♀ *Ibid.* 15-X-

1996, 6 ♀ *Ibid.* 28-XI-1995, 1 ♀ La Darcena (CD), 23-I-1997, 4 ♀ *Ibid.* 18-III-1996, 1 ♀ *Ibid.* 27-XI-1995, 1 ♀ Ojo de Agua (P), 31-VIII-1995, 2 ♀ *Ibid.* 30-XI-1995, 3 ♀ *Ibid.* 1-XII-1995, 4 ♀ Peten Tucha (P), 21-III-1996, 4 ♀ *Ibid.* 11-VII-1996, 25 ♀ 2 ♂ Rio Lagartos, 6-III-1994, net; 39 ♀ Tzucacab, 10-V-1995, Malaise trap.

*Tabanus haemagogus* Williston, 1901

The type locality of this species is Temax, Yucatan. Known distribution Mexico (Tabasco) to Guatemala (Fairchild 1971; Fairchild & Burger 1994). Within PY, it has been reported for Yucatan (Chichen Itza, Izamal, Merida, Temax and Tohil) (as *T. filiulus* Williston 1901) (Williston 1901; Bequaert 1931, 1933; Pearse 1938, 1945). It is reported here for the first time for Quintana Roo. It probably also occurs in Campeche.

Material Examined: QUINTANA ROO, El Eden Reserve, 2 ♀ El Eden, 18-III-1996. YUCATAN, Celestun Reserve, 7 ♀ Rancho Loma Bonita (P), 16-VII-1996, 2 ♀ *Ibid.* 7-IX-1995, 4 Rancho Loma Bonita (DTF), 16-VII-1996; Cuxtal Reserve, 2 ♀ Xmatkuil (DTF), 10-17-III-1997, Malaise trap, 5 ♀ *Ibid.* 4-8-V-1996, 1 ♀ *Ibid.* 16-V-1997, 2 ♀ 28-V-2-VI-1997, 1 ♀ *Ibid.* 1-24-VI-1997, 2 ♀ *Ibid.* 4-8-VI-1996, 2 ♀ *Ibid.* 5-15-VI-1996, 2 ♀ *Ibid.* 5-16-VI-1996, 4 ♀ *Ibid.* 10-VI-1997, 7 ♀ *Ibid.* 17-VI-1997, 20 ♀ 1 ♂ *Ibid.* 18-22-VI-1996, 2 ♀ *Ibid.* 18-24-VI-1997, 38 ♀ 4 ♂ *Ibid.* 18-22-VI-1996, 11 ♀ 2 ♂ *Ibid.* 18-28-VI-1996, 1 ♀ *Ibid.* 28-VI-5-VII-1996, 4 ♀ *Ibid.* 18-VI-5-VII-1996, 1 ♀ 1 ♂ *Ibid.* 1-15-VII-1997, 1 ♀ *Ibid.* 5-15-VII-1996, 1 ♀ *Ibid.* 14-VII-1993, 2 ♀ *Ibid.* 1-24-VII-1997, 1 ♀ 1 ♂ *Ibid.* 24-VII-4-VIII-1996, net, 44 ♀ *Ibid.* 24-VII-4-VIII-1996, 3 ♀ 4 ♂ *Ibid.* 29-VII-4-VIII-1996, net, 3 ♀ *Ibid.* 29-VII-1996, 30 ♀ 2 ♂ 1-VIII-29-IX-1996, 1 ♀ *Ibid.* 2-IX-1992, net, 7 ♀ *Ibid.* 17-25-IX-1996, 4 ♀ *Ibid.* 29-VIII-4-IX-1996, 3 ♀ *Ibid.* 17-25-IX-1996, 2 ♀ *Ibid.* 7-14-X-1996, 5 ♀ *Ibid.* 9-16-X-1996, 1 ♀ *Ibid.* 10-X-1992, 2 ♀ *Ibid.* 11-18-X-1996, 1 ♀ 14-21-X-1996, 1 ♀ *Ibid.* 21-28-X-1996, 1 ♀ 26-30-X-1996, 6 ♀ 3 ♂ *Ibid.* 28-X-4-XI-1996, 1 ♀ *Ibid.* 24-28-XI-1994, 1 ♀ *Ibid.* 26-30-XI-1996; Ria Lagartos Reserve, 1 ♀ Ojo de Agua (P), 1-XII-1995, 3 ♀ Peten Tucha, 11-VII-1996, 3 ♀ Entrada a Sac-Bo (DTF), 9-VII-1996; 15 ♀ Tzucacab, 23-IX-1994, net.

*Tabanus occidentalis* var. *dorsovittatus* Macquart, 1855

Known Distribution: Mexico to Argentina and Trinidad (Fairchild 1971; Fairchild & Burger 1994). Within PY it has been reported only for Quintana Roo (Sian Ka'an) (Ibáñez-Bernal 1992). It is here reported for the first time for Campeche and Yucatan.

Material Examined: CAMPECHE, Calakmul Reserve, 2 ♀ archaeological zone, 3-V-1997, Malaise trap, 4 ♀ El Refugio, 2-I-1993, Malaise trap. YUCATAN, 2 ♀ Celestun (CD), 23-I-1997, 5 ♀



*Ibid.* 27-III-1996, 1 ♀ *Ibid.* 4-IX-1995, 6 ♀ *Ibid.* 7-XII-1995, 1 ♀ Dumac (M), 22-I-1997, 1 ♀ *Ibid.* 28-III-1996, 1 ♀ *Ibid.* 3-VII-1997, 1 ♀ *Ibid.* 6-IX-1996, 1 ♀ *Ibid.* 6-XII-1995, 35 ♀ Ecoparaiso (CD), 21-I-1997, 2 ♀ *Ibid.* 17-VII-1996, 3 ♀ *Ibid.* 26-X-1996, 2 ♀ Ecoparaiso (M), 18-VII-1996, 2 ♀ Peten 2, 20-I-1997, 2 ♀ *Ibid.* 8-IV-1997, 123 ♀ Rancho Loma Bonita (P), 25-III-1996, 1 ♀ *Ibid.* 8-IV-1997, 51 ♀ *Ibid.* 7-IX-1995, 3 ♀ *Ibid.* 4-XII-1995, 60 ♀ Rancho Loma Bonita (DTF), 20-III-1996, 5 ♀ *Ibid.* 7-IV-1997, 168 ♀ *Ibid.* 16-VII-1996, 33 ♀ *Ibid.* 5-IX-1995, 22 ♀ *Ibid.* 23-X-1996, 38 ♀ *Ibid.* 5-XII-1995; Cuxtal Reserve, 1 ♀ Xmatkuil, 24-VII-4-VIII-1996, net; Dzilam Reserve, 1 ♀ Dzilam, 2-I-1993, 1 ♀ *Ibid.* 20-I-1993; Ria Lagartos Reserve, 4 ♀ Ojo de Agua (P), 16-I-1997, 1 ♀ *Ibid.* 21-III-1996, 10 ♀ *Ibid.* 8-IV-1997, 41 ♀ *Ibid.* 7-VII-1997, 5 ♀ *Ibid.* 31-VIII-1995, 23 ♀ *Ibid.* 14-X-1996, 13 ♀ *Ibid.* 30-XI-1995, 26 ♀ *Ibid.* 1-XII-1995, 1 ♀ Peten Tucha, 21-III-1996, 4 ♀ *Ibid.* 4-IV-1997, 45 ♀ *Ibid.* 8-VII-1996, 4 ♀ *Ibid.* 1-IX-1995, 1 ♀ *Ibid.* 1-XII-1995, 17 El Cuyo (M), 11-VII-1996, 12 ♀ *Ibid.* 16-X-1996, 22 ♀ *Ibid.* 29-XI-1995, 3 ♀ Entrada a Sac-Bo (DTF), 19-III-1996, 1 ♀ La Darcena (CD), 18-III-1996, 2 ♀ *Ibid.* 12-VII-1996, 15 ♀ *Ibid.* 17-X-1996.

*Tabanus oculus* Walker, 1848

Known Distribution: Northern Mexico (Tampico, Tamaulipas) to Panama (Fairchild 1971; Fairchild & Burger 1994). Within PY, it has been reported from Yucatan (Chichen Itza) (Bequaert 1931, 1933; Pearse 1945) and Quintana Roo (Colonia Santa Maria, Sian Ka'an and southeast of Peto) (Bequaert 1931; Pearse 1945; Ibáñez-Bernal 1992). Pearse (1945) erroneously cited Colonia Santa Maria, which is near to Puerto Morelos, as Puerto Morelos. It is reported here for the first time for Campeche.

Material Examined: CAMPECHE, 17 ♀ La Libertad, 24-VI-1993, net; Calakmul Reserve, 5 ♀ El Refugio, 2-IX-1993, Malaise trap, 16 ♀ *Ibid.* 11-IX-1993, 24 ♀ archaeological area, 3-V-1997, Malaise trap. QUINTANA ROO, 13 ♀ Vallehermoso, 21-VII-1993. YUCATAN, Celestun Reserve, 2 ♀ Rancho Loma Bonita (P), 26-III-1996, 2 ♀ *Ibid.* 7-IX-1995, 1 ♀ *Ibid.* 4-XII-1995, 2 ♀ Rancho Loma Bonita (DTF), 23-III-1996, 1 ♀ *Ibid.* 16-VII-1996, 2 ♀ *Ibid.* 5-IX-1995, 5 ♀ *Ibid.* 23-X-1996, 4 ♀ *Ibid.* 5-XII-1995; Cuxtal Reserve, 1 ♀ Xmatkuil (DTF), 8-10-VI-1994, Malaise trap, 1 ♀ *Ibid.* 8-28-VI-1996; Ria Lagartos Reserve, 1 ♀ Ojo de Agua (P), 7-VII-1997, 2 ♀ *Ibid.* 16-X-1996, 6 ♀ *Ibid.* 1-XII-1995, 1 ♀ Peten Tucha (P), 7-VII-1997.

*Tabanus pungens* Wiedemann, 1828

Known Distribution: Texas to northern Argentina, Trinidad, but not West Indies nor Chile (Coscarón 1979; Fairchild 1986; Fairchild & Burger 1994). This species was erroneously described

from Mexico by Bellardi (as *T. sallei* Bellardi 1859 and *T. propinquus* Bellardi 1859). No specific data about its locality were given. It is reported here for the first time for PY (Yucatan).

Material Examined: YUCATAN, Celestun Reserve, 2 ♀ Rancho Loma Bonita (DTF), 1-VII-1997; Ria Lagartos Reserve, 3 ♀ Ojo de Agua (P), 31-VIII-1995, 1 ♀ Peten Tucha, 21-III-1996, 1 ♀ *Ibid.* 8-VII-1996, 1 ♀ *Ibid.* 1-IX-1995, 1 ♀ *Ibid.* 31-XI-1995, 1 ♀ Rio Lagartos (DTF), 13-I-1997, Malaise trap.

*Tabanus vittiger* ssp. *guatemalanus* Hine, 1906

Known Distribution: USA (Florida) to Brazil, Bahamas, Cuba, Cayman Islands, Jamaica, Puerto Rico and Galapagos Islands (Cruz & Garcia 1974; Fairchild 1978; Fairchild & Burger 1994). In Mexico, its known distribution is apparently restricted to the southeast. Within PY, it had been reported for Campeche (Philip 1954b) and Quintana Roo (Sian Ka'an) (Ibáñez-Bernal 1992). In 1983, Fairchild wrote that this species occurs at least to Yucatan and Campeche, without specific records. It is reported here, probably for the first time for Yucatan.

Material Examined: YUCATAN, Celestun Reserve, 49 ♀ Celestun (CD), 22-I-1997, 27 ♀ *Ibid.* 27-III-1996, 75 ♀ 1 ♂ *Ibid.* 4-IX-1995, 57 ♀ *Ibid.* 7-XII-1995, 29 ♀ Dumac (M), 23-I-1997, 7 ♀ *Ibid.* 28-III-1996, 1 ♀ *Ibid.* 19-VII-1996, 11 ♀ *Ibid.* 6-IX-1995, 14 ♀ *Ibid.* 6-XII-1995, 2 ♀ Celestun (P), 30-VI-1997; 1 ♀ Ecoparaiso (CD), 21-I-1997, 8 ♀ *Ibid.* 17-VII-1996, 22 ♀ *Ibid.* 26-X-1996, 5 ♀ Ecoparaiso (M), 9-IV-1997, 30 ♀ *Ibid.* 18-VII-1996, 10 ♀ *Ibid.* 25-X-1996, 8 ♀ Rancho Loma Bonita (P), 26-III-1996, 23 ♀ *Ibid.* 7-IX-1995, 1 ♀ *Ibid.* 24-X-1996, 2 ♀ *Ibid.* 4-XII-1995, 2 ♀ Rancho Loma Bonita (DTF), 21-I-1997, 4 ♀ *Ibid.* 26-III-1996, 4 ♀ *Ibid.* 7-IV-1997, 37 ♀ *Ibid.* 17-VII-1996, 19 ♀ 1 ♂ *Ibid.* 4-5-IX-1995, 1 ♀ *Ibid.* 23-X-1996, 4 ♀ *Ibid.* 5-XII-1995; 3 ♀ Chuburna Puerto, 15-IV-1995, Malaise trap; Dzilam Reserve, 2 ♀ Dzilam, 2-II-1993, net; Ria Lagartos Reserve, 1 ♀ Ojo de Agua (P), 16-I-1997, 4 ♀ *Ibid.* 7-VII-1997, 71 ♀ *Ibid.* 31-VIII-1995, 11 ♀ *Ibid.* 4-IX-1995, 3 ♀ *Ibid.* 14-X-1996, 4 ♀ *Ibid.* 30-XI-1995, 7 ♀ *Ibid.* 4-IV-1997, 3 ♀ El Cuyo (M), 14-I-1997, 9 ♀ *Ibid.* 11-VII-1996, 2 ♀ *Ibid.* 30-VIII-1995, 18 ♀ *Ibid.* 16-X-1996, 1 ♀ *Ibid.* 28-XI-1995, 16 ♀ *Ibid.* 29-XI-1995, 1 ♀ Entrada a Sac-Bo (DTF), 13-I-1997, 3 ♀ *Ibid.* 19-III-1996, 2 ♀ *Ibid.* 9-VII-1997, 1 ♀ *Ibid.* 29-VIII-1995, 1 ♀ *Ibid.* 15-X-1996, 11 ♀ La Darcena (CD), 11-IV-1997, 1 ♀ *Ibid.* 10-VII-1996, 1 ♀ *Ibid.* 28-VIII-1995, 5 ♀ *Ibid.* 17-X-1996, 1 ♀ *Ibid.* 27-XI-1995, 1 ♀ Peten Tucha, 21 ♀ *Ibid.* 8-VII-1996, 6 ♀ *Ibid.* 1-IX-1995, 6 ♀ Rio Lagartos, 6-III-1994, Malaise trap and net.

*Tabanus yucatanus* Townsend, 1897

The type locality is in the Cenote of Xcolak, 10 mi. SE of Izamal, Yucatan (Townsend 1897).

Known Distribution: Southeast Mexico to Guatemala, Honduras, El Salvador, Costa Rica and Nicaragua. In Mexico the distribution is confined to Chiapas and PY (Fairchild 1971; Fairchild & Burger 1994). Within PY it has been collected in Campeche (Fairchild & Burger 1994), Quintana Roo (Colonia Santa Maria) and Yucatan (Chichen Itza and Merida) (Bequaert 1931; Pearse 1945).

Material Examined: YUCATAN, Celestun Reserve, 1 ♀ Rancho Loma Bonita (DTF), 5-IX-1995.

#### DISCUSSION

The tabanid fauna of the biotic province of Yucatan includes a little more than 14% of the species known for Mexico. Because collecting has been scattered, knowledge of the tabanid fauna of PY and Mexico is incomplete. However, we consider that species diversity recorded to date is similar to the actual species diversity from this province. The records of most species show wide distribution within the biotic province of Yucatan, probably related to homogeneous physiography (climate, surface, geology and hydrology) which characterizes the province (Barrera 1962; Alvarez & de Lachica 1991).

Thus, according to information provided by Fairchild (1969) and current known distribution of species, we can consider that most of the tabanid fauna of the biotic province of Yucatan is mainly composed of Neotropical elements. Some species found are widely distributed in the Antilles (i.e., *D. ferrugatus*, *L. crassipes* and *S. jamaicensis*), thus suggesting an important input of the Antillean component to the tabanid fauna of the biotic province of Yucatan.

The best represented genera, *Chrysops* and *Tabanus*, have a worldwide distribution, and do not seem to show affinity to any specific biogeographic pattern. However, 11 of the 15 species of *Chrysops* and *Tabanus* reported show an exclusively Neotropical distribution (amphitropical). In contrast, *C. flavidus*, *T. colombensis*, *T. pungens* and *T. vittiger* have Neotropical distributions but extend to the southern Nearctic Region.

A comparison of the fauna of both biotic provinces in PY is difficult. The biotic province of Peten is a larger area and ecologically more diverse than the biotic province of Yucatan. It includes southern PY, the Mexican states of Tabasco and Chiapas (north), Belize and the Peten of Guatemala (Alvarez and de Lachica 1991). In contrast to the biotic province of Yucatan, it includes rivers and higher lands (600-1500 meters).

The biotic province of Peten has a higher species diversity. According to the catalogue of Fairchild & Burger (1994), 85 species have been reported from this province. At least 23 of the collected species within the biotic province of Yucatan also have been recorded in the biotic

province of Peten. In addition, we expect that *C. auroguttatus*, *C. flavidus*, *L. itzarum*, *T. colombensis* and *T. commixtus* could also be distributed within this province. Because of the few records of *S. pechumani*, we cannot speculate about its probable distribution. We consider that the number of species reported for Peten is conservative, since the Mexican states of Tabasco, southern Campeche and northern Chiapas have been poorly sampled. At present, because of the general distribution of the predominantly Neotropical elements of the tabanid fauna of both biotic provinces, it is not possible to use the tabanid fauna to sustain or reinforce the criteria defining the biotic provinces of Yucatan and Peten. However, a complete characterization of tabanid fauna of the Peten Province, including information on the unique northern distribution limits of the species could help to confirm or redefine the limits of these biotic provinces.

Thus, to obtain a complete characterization of PY (including the biotic provinces of Yucatan and Peten), it is necessary to intensify sampling in non-collected areas (i.e., those with different habitats such as cenotes, rivers, medium and high tropical forests), and southern PY included in the northern part of the biotic province of Peten (Alvarez & de Lachica 1991).

The tabanid fauna of some protected and non-protected areas of wetlands, cenotes, medium and high tropical forests remains unknown. For Campeche and Quintana Roo, most of the records are from Calakmul and Sian Ka'an, both under-sampled. It would be desirable to have more systematic sampling within the southern parts of both reserves, especially for Calakmul, which is adjacent to a very important biogeographic Mesoamerican corridor that penetrates southern Mexico. Also special efforts should be made in coastal areas such as the Area de Protección de Flora y Fauna de Laguna de Términos (Campeche), Yum Balam-El Eden and islands such as Cozumel and Isla Contoy (Quintana Roo).

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