Braconid Wasps (Hymenoptera: Braconidae) of Northern Yucatan, Mexico: Subfamilies Agathidinae and Doryctinae (excluding *Heterospilus* Haliday)

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Braconid Wasps (Hymenoptera: Braconidae) of Northern Yucatan, Mexico: Subfamilies Agathidinae and Doryctinae (excluding *Heterospilus* Haliday)

Roger Cauich-Kumul,[1] Hugo Delfin-Gonzalez,[1] Victor Lopez-Martinez,[2] and Michael Sharkey[3]

ABSTRACT: The Braconidae fauna (Agathidinae and Doryctinae, excluding *Heterospilus* Haliday) of the Ria Lagartos Biosphere Reserve in Yucatan, Mexico are recorded. Eighty-three species and 29 genera were found; of these 62 species are new records for Mexico. The general distribution and flight period of the taxa collected are provided.

KEY WORDS: Braconid fauna, species records, flight period

Braconidae is a diverse group of parasitoid wasps with a worldwide distribution and with species that are important in the natural and biological control of many crop pests. Most braconids are primary parasites, especially of larval instars of Coleoptera, Diptera and Lepidoptera. Other hosts include nymphs and adults of Hemiptera, nymphs of Orthoptera and Psocoptera, adults of aculeate Hymenoptera, and larvae of Symphyta (Tobias, 1967; Wharton, 1993).

This family contains 34 subfamilies and more than 400 genera in the New World, but their distribution patterns in Neotropical regions are largely unknown, due either to lack of attention and lack of intensive sampling (Wharton *et al.,* 1997). Close to 277 genera and 355 species are recorded for Mexico (Delfín and Wharton, 2000, 2002; Wharton and Mercado, 2000; Delfín *et al.,* 2002, among many others). The fauna of the state of Yucatan has not been extensively studied. Presently, 31 species of braconid wasp are recorded, of these, ten are Agathidinae and three are Doryctinae (López-Martínez unpublished data).

The Ria Lagartos Biosphere Reserve (RLBR) is the only nesting population site of rose flamingos (*Phoenicopterus ruber* L. *ruber*) in Mexico (Fraga, 2006), and it is one of the most important protected areas with tropical deciduous forest in the country (Cué-Bär *et al.,* 2006).

The purpose of this paper is to record the species of Agathidinae and Doryctinae of the Mexican Ria Lagartos Biosphere Reserve as part of ongoing faunistic studies of Braconidae in Yucatan. Presently, *Aleiodes cameronii* (Dalla Torre) (Rogadinae) is the only braconid recorded for the area (Delfin and Wharton, 2000).

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Materials and Methods

Study area

Ria Lagartos Biosphere Reserve (RLBR) is located at 21°32′ to 21°34′N Latitude and 87°35′ to 88°15′W Longitude). These coordinates are located in the north coast of the Yucatan Peninsula, in the northeastern extreme of the State of Yucatan, Mexico, and includes 74 km of the 370 km of coastline of this state (Fraga, 2006).

The reserve is located in a transition climates zone, the west has a semiarid climate and the eastern a sub-humid warm climate; temperatures are uniform throughout the year, 23–27°C (Arriaga *et al.,* 2002; CONANP, 2007). There are two distinct seasons, a wet season from June through October, accounting for 60% of the total annual rainfall, and a dry season, from November through May. The specimens were collected in the three dominant vegetation types of RLBR: dune vegetation, savannah and tropical deciduous forest.

Dune vegetation. This extends in a narrow coastal strip behind beaches on sandy, well-drained soils in regions where rainfall is very low. The main components of the dune vegetation are herbs and shrubs, as well as a few trees of low stature. Some of the characteristic tree species are *Metopium brownei* (Jacq.) Urban., *Coccothrinax readii* H.J. Quero R. and *C. uvifera* L., *Chrysobalanus icaco* L. and the palms *Thrinax radiata* Lodd. Ex Schult. and *Pseudophoenix sargentii* H. Wendl. ex Sarg. Several cultivated species (*Casuarina equisetifolia* L. and *Cocos nucifera* L.) have also become established.

Savannah. The density and species composition of trees found in savannah habitats are both extremely variable. Savannahs normally occur on thin, poorly drained soils that become inundated during the rainy season and remain very dry during the dry season. Periodic fires are common in these ecosystems, and appear to be, along with the soil, responsible for the occurrence of this vegetation type. They are typically composed of a herbaceous layer dominated by species of fire-resistant grasses and sedges (the plant families Poaceae and Cyperaceae) and a tree layer, composed of twisted and gnarled trees that are highly variable in density. Some of the typical tree species are the palms *Acoelorraphe wrightii* Griseb. & H.Wendl) H.Wendl.ex Becc., *Byrsonima crassifolia* (L.) Kunth, *Crescentia cujete* L. and *Curatella americana* L.

Tropical deciduous forest. Found in shallow soils, often around rocky outcrops. The climate is extreme, with a dry season of 7–8 months and usually less than 800 mm of rainfall per year, although on occasion precipitation can reach 1200 mm per year. The tree canopy is usually 6–10 m high, and is composed of species that lose their leaves during the dry season. The dominant plant family is the Leguminosae, and some of the most important species of this family are *Acacia gaumeri* S. F. Blake, *Bauhinia divaricate* L., *Caesalpinia gaumeri* Greenm. and *C. yucatanensis* (Britton & Rose) Greenm., *Havardia albicans* (Kunth) Britton & Rose, *Leucaena leucocephala* (Lam.) De Wit and *Piscidia piscipula* (L.) Sarg. Other common trees are *Alvaradoa amorphoides* Liebm., *Bursera simarouba* (L.), *Diospyros anisandra* S. F. Blake, *Gyrocarpus jatrophifolius* Domin, *Jatropha gaumeri* Greenm., *Maclura tinctorea* (L.) D. Don. ex Steud., *Neomillspaughia emarginata* (H. Gross) S.F Blake., *Plumeria rubra* L. and *Pseudobombax ellipticum* (Kunth) Dugand (Brokaw *et al.,* 2006).

Insect collection and identification

Specimens were collected using 12 malaise traps, four in each vegetation type. Within each vegetation type, the four traps were placed in two widely separated sites

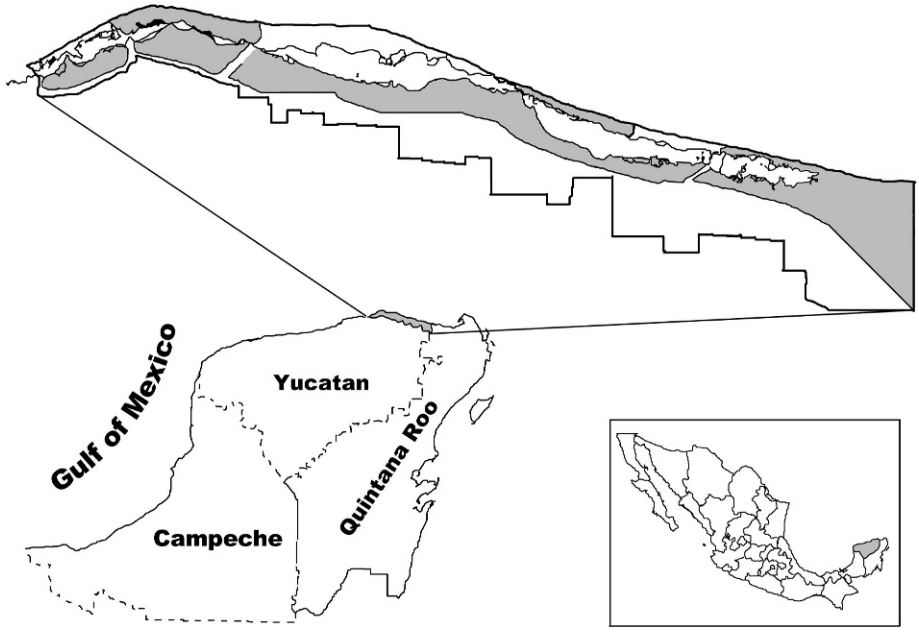

Fig. 1. Collection sites in the Ría Lagartos Biosphere Reserve, Yucatan, México.

(Fig. 1). Sampling was conducted between June 2008 and June 2009 and traps were checked every 15 days (Table 1). The recorded collection dates are those days when the traps were checked. Specimens were preserved in 70% ethanol, mounted on triangular labels, and examined with a stereoscopic binocular microscope for determination.

We used a variety of resources to identify species, Berta De Fernández (1998), Leathers and Sharkey (2003), Lindsay and Sharkey (2006), Sharkey (1988, 1990) for Agathidinae, and primarily Barbalho *et al.* (1999), and Marsh (1993, 2002) for Doryctinae. Identities were corroborated using specimens in the Hymenoptera Institute Collection (HIC) (Department of Entomology, University of Kentucky).

Data are arranged as follows: valid name, world and local distribution known, flight period and collection data. Acronyms used in the text are as follows: SDV = Sandy dune vegetation, S = Savannah, and TDF = Tropical Deciduous Forest. An asterisk is incorporated to species reported for the first time for Mexico.

All material is deposited in the Colección Entomológica Regional (CER-UADY) (Universidad Autonoma de Yucatan) and the Hymenoptera Institute Collection (HIC) (Department of Entomology, University of Kentucky).

Results

1047 specimens of Agathidinae (3 genus, 11 species and 710 specimens) and Doryctinae (26 genus, 72 species and 337 specimens) were determined. Species are listed alphabetically by subfamily, distribution and flight period is given for each taxa determined.

SubfamilyAgathidinae

Alabagrus albispina (Cameron) 1887

Table 1. Number of samples and sampling periods.

Sample	Dates (d/m/y)	Sample	Dates (d/m/y)
1	20/5 to 03/6/2008	16	23/12/2008 to 07/1/2009
2	3–17/6/2008	17	07–21/1/2009
3	17/6 to 01/7/2008	18	21/1 to 04/2/2009
4	01–14/7/2008	19	04–18/2/2009
5	14–28/7/2008	20	18/2 to 04/3/2009
6	28/7 to 12/8/2008	21	04–18/3/2009
7	12–28/8/2008	22	18/3 to 01/4/2009
8	28/8 to 10/9/2008	23	01–15/4/2009
9	10–24/9/2008	24	15–29/4/2009
10	24/9 to 08/10/2008	25	29/4 to 13/5/2009
11	08–22/10/2008	26	13–27/5/2009
12	22/10 to 10/11/2008	27	27/5 to 10/6/2009
13	10–26/11/2008	28	10–24/6/2009
14	26/11 to 10/12/2008	29	24/6 to 08/7/2009
15	10–23/12/2008		

Distribution. Central America, Caribbean Islands, and northern South America (Cameron, 1887; Shenefelt, 1970; Leathers and Sharkey, 2003). In Mexico it has been recorded from Baja California Sur, Chiapas, Colima, Guerrero, Hidalgo, Morelos, Nayarit, Nuevo León, Oaxaca, Puebla, Sonora, Sinaloa, Veracruz, Tamaulipas and Yucatán. From Yucatan the only locality mentioned is Valladolid (Cameron, 1887; Sharkey, 1988; Coronado *et al.,* 2004).

Flight period: January, June–November.

Material examined. SDV: 2 female, 12/VIII/08, 1 female, 28/VIII/08; 2 female, 08/X/08; 2 female, 22/X/08; 2 female, 10/XI/08; 26 female, 26/XI/08; 1 female, 08/VII/09; 3 female, 2 male, 22/VII/09; 2 male, 06/VIII/09; S: 1 female, 1 male, 17/VI/08; 7 female, 27 male, 01/VII/08; 13 female, 33 male, 14/VII/08; 11 female, 39 male, 28/VII/08; 11 female, 10 male, 12/VIII/08; 2 female, 1 male, 28/VIII/08; 16 female, 10 male, 10/IX/08; 4 female, 24/IX/08; 6 female, 08/X/08; 1 male, 22/X/08; 1 female, 2 male, 10/VI/09; 18 female, 6 male, 24/VI/09; 15 female, 2 male, 07/VII/09; 19 female, 34 male, 08/VII/09; 8 female, 4 male, 22/VII/09; 1 female, 2 male, 24/VII/09; 4 female, 1 male, 06/VIII/09; TDF: 13 female, 18 male, 03/VI/08; 4 female, 22 male, 17/VI/08; 14 male, 14/VII/08, 2 male, 28/VII/08; 9 female, 13 male, 12/VIII/08, 1 female, 28/VIII/08; 5 male, 10/IX/08; 2 female, 8 male, 24/IX/08; 2 female, 1 male, 07/I/09; 1 male, 17/VI/09; 2 female, 24/VI/09; 5 female, 5 male, 08/VII/09; 6 female, 5 male, 22/VII/09; 1 female, 6/VIII/09.

Alabagrus cora Sharkey 1988

Distribution. Endemic in Mexico (Jalisco and Morelos) (Sharkey, 1988; Coronado *et al.,* 2004); this is the first record for Yucatan.

Flight period: June and September.

Material examined. S: 1 female, 1 male, 10/IX/08; 1 female, 10/VI/09.

Alabagrus nigritulus (Szepligeti) 1902

Distribution. Principally Neotropical, from Mexico to Argentina (Szépligeti, 1902; Braet and Fretey, 1997; Leathers and Sharkey, 2003; Coronado *et al.,* 2004; Ruiz *et al.,* 2010;). In Mexico this species is recorded from Chiapas, Nuevo León, San Luis Potosi,

Oaxaca, Puebla, Veracruz, and Tamaulipas (Sharkey, 1988; Coronado *et al.,* 2004; Ruiz-Cancino *et al.,* 2010). Yucatan is a new state record for Mexico.

Flight period: June.

Material examined. S: 1 male, 29/VII/IX.

Alabagrus roibasi Sharkey 1988

Distribution. Neotropical: Costa Rica, El Salvador and Mexico (Sharkey, 1988; Leathers and Sharkey, 2003; Coronado *et al.,* 2004). This species is widely collected across Mexico (Chiapas, Coahuila, Guerrero, Jalisco, Morelos, Oaxaca, San Luis Potosi, Tamaulipas, Veracruz and Yucatan) (Sharkey, 1988; Coronado *et al.,* 2004). The previously cited locality in Yucatan was Chichen Izta. RLBR is a new locality.

Flight period: August.

Material examined. SDV: 2 male, 06/VIII/09; S: 2 male, 24/VI/09; 2 female, 2 male, 07/VII/09; 1 male, 27/VII/09; TDF: 1 female, 12/VIII/08; 1 female, 08/VII/09; 2 female, 22/VII/09.

Alabagrus sanctus (Say) 1836

Distribution. Mexico and United States (Ashmead, 1895; Muesebeck, 1927). In Mexico it has been recorded from Baja California Sur. Yucatan is the southernmost record for this species.

Flight period: June and July.

Material examined. S: 1 female, 10/VI/09; 1 male, 08/VII/09; 1 female, 24/VII/09; TDF: 1 female, 17/VI/09; 1 female, 24/VI/09.

Amputoearinus niger Lindsay and Sharkey 2006

Distribution. Neotropical, from Mexico to Colombia and Venezuela (Lindsay and Sharkey, 2006); previously mentioned from Tamaulipas. Yucatan is a new state record for Mexico.

Flight period: October and January.

Material examined. SDV: 1 female, 08/X/08; 1 female, 21/I/09.

**Cremnops cubensis* (Cresson) 1865

Distribution. Only recorded from The Bahamas and Cuba (Cresson, 1865; Berta de Fernández, 1998; Portuondo and Fernández, 2004). This record is the first continental report for the species.

Flight period: June.

Material examined. TDF: 1 female, 23/VI/09.

Cremnops ferrugineus (Cameron) 1887

Distribution. Neotropical, from Mexico to Panama (Cameron, 1887; Shenefelt, 1970; Berta de Fernández, 1998). State records from Mexico include Chiapas, Colima, Estado de Mexico, Guerrero, Jalisco, Morelos, Nayarit and Yucatan (Merida) (Cameron, 1887; Shenefelt, 1970; Berta de Fernández, 1998; Coronado *et al.,* 2004).

Flight period: June–July and September.

Material examined. SDV: 2 female, 22/VII/09; S: 18 female, 28/VII/08; 8 female, 1 male, 12/VIII/08; 6 female, 28/VIII/08; 1 female, 3 male, 10/IX/08; 2 female, 10/VI/09; 8 female, 2 male, 24/VI/09; 14 female, 07/VII/09; 52 male, 08/VII/09; 1 female, 22/VII/09;

1 female, 24/VII/09; 11 female, 27/VII/09; 4 female, 29/VII/09; TDF: 3 female, 03/VI/08; 1 female, 24/IX/08; 2 female, 23/VI/09; 2 female, 07/VII/09; 1 female, 08/VII/09.

Cremnops melanoptera Ashmead 1894

Distribution. Nearctic: United States and Mexico (Baja California Sur) (Ashmead, 1895; Morrison, 1917; Marsh, 1961; Shenefelt, 1970; Krombein and Hurd, 1979; Berta de Fernandez, 1998). Yucatan is a new state record for the country.

Flight period: July and August.

Material examined. S: 2 female, 3 male, 08/VII/09; 4 female, 1 male, 27/VII/09; 7 female, 3 male, 06/VIII/09.

Zacremnops cressoni (Cameron) 1887

Distribution. Nearctic and Neotropical: from United States to Venezuela; in the Caribbean from Cuba and Jamaica (Cameron, 1887; Shenefelt, 1970; Krombein and Hurd, 1979; Ruiz *et al.,* 1990; Sharkey, 1990; Portuondo and Fernandez, 2004; Pucci and Sharkey, 2004; López-Martínez *et al.,* 2009; Ruiz *et al.,* 2010). In Mexico this species is widely collected across the country: Campeche, Chiapas, Colima, Estado de Mexico, Guanajuato, Hidalgo, Jalisco, Morelos, Nayarit, Nuevo León, Oaxaca, Puebla, Queretaro, Quintana Roo, San Luis Potosi, Sinaloa, Sonora, Tamaulipas, Veracruz, Yucatan (Cameron, 1887; Krombein and Hurd, 1979; Ruiz *et al.,* 1990; Sharkey, 1990; Coronado *et al.,* 2004; Pucci and Sharkey, 2004; López-Martínez *et al.,* 2009; Ruiz *et al.,* 2010).

Flight period: July–October.

Material examined. S: 7 female, 9 male, 01/VII/08-08/X/08; 4 female, 1 male, 27/VII/09; 7 female, 3 male, 06/VIII/09; TDF: 2 male, 14/VII/08; 1 female, 3 male, 24/IX/08.

Zacremnops ekchuah Sharkey 1990

Distribution. Neotropical: Costa Rica, Guatemala and Mexico (Sharkey, 1990; López-Martínez *et al.,* 2009). Mexican records are Colima, Chiapas, Durango, Guerrero, Jalisco, Michoacan, Morelos, Sinaloa, Tabasco and Yucatan. Previous Yucatan records are Pisté and Xmatkuil.

Flight period: June.

Material examined. S: 1 male, 17/VI/08; 1 female, 1 male, 10-24/VI/09; TDF: 3 males, 03-17/VI/08.

Zelomorpha arizonensis Ashmead 1900

Distribution. Nearctic, United States and Mexico –Baja California Sur- (Muesebeck, 1927; Krombein and Hurd, 1979). Yucatan is the southern-most record.

Flight period: June–September.

Material examined. SDV: 2 female, 10 male, 06/VIII/09; 5 female, 1 male, 08-22/VII/09; S: 2 female, 1 male, 24/IX/08; 3 female, 2 male, 13-24/VI/09; 19 female, 5 male, 07-27/07/09; 1 male, 06/VIII/09; TDF: 4 female, 24/VI/09.

Subfamily Doryctinae

Acrophasmus exilis Enderlein 1912

Distribution. Neotropical: Colombia, Costa Rica, Honduras, Mexico and Panama (Enderlein, 1912; Marsh, 2002). In Mexico previous authors did not recorded locality data, Yucatan is the first geographical data for the country.

Flight period: June and October.
Material examined. S: 1 female, 08/X/08; TDF: 1 female, 24/VI/09.

**Acrophasmus gauldi* Marsh 2002

Distribution. The only record is for Costa Rica (Marsh, 2002). This is the first report for Mexico.
Flight period: March.
Material examined. SDV: 1 male, 18/III/09.

**Acrophasmus maeandrius* Enderlein 1920

Distribution. Reported from Brazil, Colombia and Costa Rica (Enderlein, 1920; Marsh, 2002). Mexico is the northern-most record.
Flight period: April.
Material examined: SDV: 1 female, 15/IV/09.

**Allorhogas breviarius* Marsh 2002

Distribution. Neotropical, previously recorded only from Costa Rica (Marsh, 2002). This is the first report for Mexico.
Flight period: June.
Material examined. TDF: 2 female, 23/VI/09.

**Allorhogas hansoni* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.
Flight period: October and December.
Material examined. S: 1 female, 22/X/08; 1 female, 23/XII/08; TDF: 1 female, 10/IX/08.

**Allorhogas infuscotarsus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.
Flight period: April.
Material examined. S: 1 female, 15/IV/09.

**Allorhogas ingavera* Marsh 2002

Distribution. Marsh (2002) described this species from leaf galls on *Inga vera* Willd. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.
Flight period: March, July and August.
Material examined. SDV: 1 female, 04/III/09; 1 female, 06/VIII/09; S: 1 female, 24/VII/09; TDF: 1 female, 18/III/09.

**Allorhogas laselva* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.
Flight period: March.
Material examined. TDF: 1 female, 18/III/09.

**Allorhogas platyfrons* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: June–July.

Material examined. S: 1 female, 24/VII/09; TDF: 1 female, 17/VI/09.

**Allorhogas rugosus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: June.

Material examined. S: 1 female, 03/VI/08.

**Allorhogas shawi* Marsh 2002

Distribution. This species was described by Marsh (2002) from many localities in Costa Rica, ranging 400–1300 masl. This is the first report for Mexico.

Flight period: April.

Material examined. S: 1 female, 29/IV/09.

**Allorhogas tectus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: June.

Material examined. SDV: 1 female, 03/VI/08.

**Caingangia flavokolos* Marsh 1993

Distribution. Only recorded from Brazil and Costa Rica (Marsh, 1993, 2002). This is the first report for Mexico.

Flight period: March–May and July.

Material examined. SDV: 2 female, 18/III/09; S: 1 female, 08/VII/09; TDF: 1 female, 1 male, 15-29/IV/09; 1 female, 13/V/09.

**Callihormius careosulcus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002) . This is the first report for Mexico.

Flight period: April and June.

Material examined. SDV: 1 female, 03/VI/08; TDF: 1 female, 29/IV/09.

**Callihormius janzeni* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica and Guatemala (Marsh, 2002) . This is the first report for Mexico.

Flight period: April, June and September.

Material examined. S: 1 female, 24/IX/08; TDF: 1 female, 15/IV/09; 1female, 24/VI/09.

**Callihormius shawi* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: June.

Material examined. TDF: 1 female, 17/VI/08.

**Coiba dentatus* Marsh 1993

Distribution. Neotropical, only recorded from Costa Rica and Panama (Marsh, 2002). This is the first report for Mexico.

Flight period: April, June and September.

Material examined. SDV: 1 female, 03/VI/08; 1 male, 10/IX/08; S: 1 female, 15/IV/09.

**Coiba woldai* Marsh 1993

Distribution. Neotropical, only recorded from Costa Rica and Panama (Marsh, 1993, 2002). This is the first report for Mexico.

Flight period: February, May–June and October.

Material examined. SDV: 1 female, 18/II/09; S: 7 female, 9 male, 08/X/08-24/VI/09; TDF: 1 male, 27/V/09; 1 female, 24/VI/09.

**Curtisella gauldi* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: September.

Material examined. S: 1 female, 24/IX/08.

**Curtisella hansoni* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: April.

Material examined: S: 1 female, 15/IV/09.

**Ecphylus blancheae* Marsh 2002

Distribution. According to Marsh (2002), this species is distributed in Costa Rica in altitudes ranging 1300–1600 masl. This is the first report for Mexico. Flight period: October.

Material examined. TDF: 1 female, 08/X/08.

**Ecphylus fasciolus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica and Panama (Marsh, 2002). This is the first report for Mexico.

Flight period: April.

Material examined. S: 1 male, 15/IV/09.

**Ecphylus fournieri* Marsh 2002

Distribution. Reported from Costa Rica, Honduras and Panama (Marsh, 2002). This is the first report for Mexico.

Flight period: December.

Material examined. SDV: 1 female, 13/XII/08.

**Ecphylus gauldi* Marsh 2002

Distribution. Widely collected in Costa Rica (Marsh, 2002). In Mexico was collected in all three vegetation types. This is the first report for Mexico.

Flight period: February–April, June and October.

Material examined. SDV: 1 female, 15/IV/09; 1 female, 10/VI/09; S: 3 female, 01-15/IV/09; TDF: 1 male, 1 female, 08-22/X/08; 1 female, 04/II/09; 1 female, 18/III/09; 2 female, 1 male, 15-29/IV/09.

**Ecphylus hansoni* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: April.

Material examined. TDF: 1 male, 24/IV/09.

**Ecphylus janzeni* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: March and April.

Material examined. TDF: 1 female, 18/III/09; 1 female, 29/IV/09.

**Ecphylus lamellus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica and Panama (Marsh, 2002). This is the first report for Mexico.

Flight period: March and April.

Material examined. TDF: 1 male, 15/IV/09.

**Ecphylus leukocoxalis* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica and Panama (Marsh, 2002). This is the first report for Mexico.

Flight period: February.

Material examined. TDF: 1 female, 18/II/09.

**Ecphylus lissoprotomus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: April and October.

Material examined. SDV: 1 female, 01/IV/09; TDF: 1 female, 18/X/08.

**Ecphylus lycti* Rohwer 1913

Distribution. Nearctic and Neotropical, United States and Costa Rica (Rohwer, 1913; Marsh, 2002). This is the first report for Mexico.

Flight period: February, April and November.

Material examined. S: 1 male, 04/II/09; TDF: 1 female, 10/XI/08; 1 female, 15/IV/09.

**Ecphylus melinus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: January–February.

Material examined. SDV: 1 female, 21/I/09; 1 female, 04/II/09.

**Ecphylus sollus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: February and November.

Material examined. SDV: 1 female, 10/XI/08; 1 female, 04/II/09.

**Ecphylus spinatus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: January, June and October.

Material examined. S: 2 female, 08-22/X/08; TDF: 1 female, 17/VI/08; 1 female, 21/I/09.

**Ecphylus terminalis* Ashmead 1894

Distribution. Neotropical, Costa Rica, Grenada and St. Vincent (Riley *et al.,* 1894; Ashmead, 1895; Marsh, 2002). This is the first report for Mexico.

Flight period: March–April, June and October.

Material examined. TDF: 1 female, 03/VI/08; 1 male, 08/X/08; 1 female, 18/III/09; 1 female, 15/IV/09.

**Ecphylus texanus* Brues 1907

Distribution. Nearctic and Neotropical, United States, Costa Rica, and Ecuador (Brues, 1907; Marsh, 1965, 2002). This is the first report for Mexico.

Flight period: February.

Material examined. TDF: 1 female, 04/II/09.

**Ecphylus variabilis* Marsh, 2002

Distribution. Wide distribution in Costa Rica (Marsh, 2002), in Mexico we only collected one male. This is the first report for Mexico.

Flight period: October.

Material examined. TDF: 1 male, 08/X/08.

Glyptocolastes texanus (Ashmead) 1889

Distribution. Nearctic and Neotropical: Costa Rica, Hawaii, Mexico and United States (Ashmead, 1889; Marsh, 1968, 2002; Shenefelt and Marsh, 1976). Reported from ''Baja California'' by Marsh (1968). Yucatan is a new state record for Mexico.

Flight period: January–June.

Material examined. SDV: 2 female, 21/I/09; 4 female, 18/III/09-24/VI/09; S: 1 female, 27/V/09; TDF: 1 female, 17/VI/08; 1 female, 18/II/09; 1 male, 15/IV/09.

**Gymnobracon denticoxa* (Enderlein) 1920

Distribution. Neotropical, Colombia, Costa Rica and Panama (Enderlein, 1920). This is the first report for Mexico.

Flight period: May.

Material examined. TDF: 1 female, 27/V/09.

**Hansonorum carolinae* Marsh 2002

Distribution. This species was collected in three provinces of Costa Rica and the canal zone of Panama (Marsh, 2002). This is the first report for Mexico.

Flight period: January, March, May–June, and October–December.

Material examined. S: 2 female, 08/X/08; 1 female, 26/XI/08; 1 female, 10/XII/08; 9 female, 07/I/09-13/V/09; TDF: 1 female, 03/VI/08; 4 female, 10/XI/08; 1 female, 04/III/09; 1 female, 18/III/09; 1 female, 13/V/09.

**Hansonorum pauli* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: February.

Material examined. S: 1 female, 02/II/09.

Hecabolus mexicanus Zaldívar-Riverón and Belokobylskij 2009

Distribution. This species was described from one female collected in Mexico, without locality data (Zaldívar-Riverón and Belokobylskij, 2009). Here we report the first complete geographic data for the species.

Flight period: March–May, and July.

Material examined. S: 1 female, 01/VII/08; 1 female, 18/III/09; 1 female, 29/IV/09; 1 female, 27/V/09; 2 female, 08/VII/09.

**Heterospathius petiolatus* Barbalho and Penteado-Dias 1999

Distribution. Described from Brazil (Barbalho *et al.,* 1999). Mexico is the northernmost record.

Flight period: April–June and August.

Material examined. S: 1 female, 01/IV/09; TDF: 1 female, 1 male, 15-29/IV/09; 1 female, 27/V/09; 2 female, 10-24/VI/09; 1 female, 06/VIII/09.

**Janzenia gauldi* Marsh 1993

Distribution. Netropical: Costa Rica, Honduras, Nicaragua and Panama (Marsh, 1993, 2002). This is the first report for Mexico.

Flight period: June.

Material examined. SDV: 1 male, 17/VI/08.

**Johnsonius costaricensis* Marsh 2002

Distribution. This species was described from material collected in Costa Rica from localities 100–2100 masl (Marsh, 2002). This is the first report for Mexico.

Flight period: February and August.

Material examined. S: 1 female, 04/II/09; TDF: 3 female, 28/VIII/08; 1 female, 18/II/09.

**Johnsonius perknus* Marsh 2002

Distribution. This species was collected from 0 to 1800 masl in Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: February.

Material examined. S: 1 female, 04/II/09.

**Labania minuta* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: January, April, June–July.

Material examined. SDV: 1 female, 03/VI/08; S: 1 female, 21/I/09; TDF: 1 female, 03/VI/08; 1 female, 04/VII/08; 1 female, 15/IV/09.

**Labania prolata* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: August.

Material examined. TDF: 1 female, 06/VIII/09.

Leluthia astigma Marsh 1967

Distribution. Nearctic and Neotropical, from Canada to Mexico (Marsh, 1967; Shenefelt and Marsh, 1976; Krombein and Hurd, 1979; Coronado *et al.,* 2004; Kula *et al.,* 2010). In Mexico has been reported from Jalisco and Sonora (Kula *et al.,* 2010). Yucatan is a new state record.

Flight period: January and April.

Material examined. SDV: 1 female, 21/I/09; 1 female, 29/IV/09; TDF: 1 female, 15/IV/09.

**Leluthia canalia* (Marsh) 1993

Distribution. Neotropical, only recorded from Costa Rica and Panama (Marsh, 2002). This is the first report for Mexico.

Flight period: January, March–April, June–July.

Material examined. S: 1 female, 04/III/09; 1 female, 01/IV/09; TDF: 1 female, 17/VI/08; 1 female, 01/VII/08; 1 female, 07/I/09.

**Leluthia flavocoxalis* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica and Panama (Marsh, 2002). This is the first report for Mexico.

Flight period: March–July.

Material examined. SDV: 1 female, 18/III/09; S: 1 female, 04/III/09; TDF: 4 female, 15-29/IV/09; 4 female, 13-27/V/09; 1 female, 17/VI/09, 1 female, 08/VII/09.

**Masonius fasciatus* Marsh 1993

Distribution. Neotropical, only recorded from Costa Rica and Panama (Marsh, 2002). This is the first report for Mexico.

Flight period: February and June.

Material examined. S: 1 female, 04/II/09; TDF: 1 female, 03/VI/08; 2 ♀, 24/VI/09.

**Notiospathius angustus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico. Flight period: June–July and November.

Material examined. S: 1 female, 26/XI/08; TDF: 2 female, 03-17/VI/08; 1 female, 14/VII/08; 1 female, 10/XI/08.

**Notiospathius melosus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.

Flight period: October.
Material examined. TDF: 1 female, 08/X/08.

**Notiospathius niger* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico. Flight period: March–April.
Material examined. TDF: 1 female, 15/IV/09; 1 male, 27/V/09.

**Notiospathius platycorsus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.
Flight period: November
Material examined. TDF: 1 male, 10/XI/08.

**Notiospathius rugonotum* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.
Flight period: June.
Material examined. S: 1 female, 10/VI/09.

**Notiospathius tinctipennis* (Cameron) 1887

Distribution. Neotropical, only recorded from Costa Rica and Panama (Marsh, 2002). This is the first report for Mexico.
Flight period: January–June and September.
Material examined. SDV: 2 female, 1 male, 21/I/09; S: 1 female, 1 male, 07-21/I/09; 1 female, 18/II/09; 6 female, 04-18/III/09; 1 male, 15/IV/09; 1 female, 13/V/09; 1 female, 24/VI/09; 1 female, 10/IX/08; TDF: 1 female, 1 male, 03/VI/08; 4 female, 04-18/III/09; 3 female, 2 male, 15-29/IV/09; 4 female, 1 male, 13-27/V/09.

Odontobracon janzeni Marsh 1988

Distribution. Neotropical, Costa Rica, Honduras and Mexico (Marsh, 1988, 2002).In Mexico is cited by Marsh (1988) in Temax, the RLBR is a new locality for Yucatan.
Flight period: September, November and December.
Material examined. S: 1 female, 10/IX/08; 1 female, 26/XI/08; 1 female, 23/XII/08.

Odontobracon montanus Cameron 1887

Distribution. Nearctic and Neotropical, from the United States to Panama, and Trinidad and Tobago (Cameron, 1887; Enderlein, 1912, 1920; Marsh, 1970, 1988, 2002; Shenefelt and Marsh, 1976; Coronado *et al.,* 2004). In Mexico it is reported from Chiapas (Enderlein, 1912, 1920; Marsh, 1988); Yucatan is a new state report in Mexico.
Flight period: January–February, April, June, August, October and December.
Material examined. SDV: 1 female, 08/X/09; 1 female, 29/IV/09; 1 female, 10/VI/09; S: 1 male, 17/VI/08; 1 female, 12/VIII/08; 3 female, 08-22/X/08; 1 male, 10/XII/08; 1 female, 21/I/09; 1 male; 24/VI/09; TDF: 1 female, 12/VIII/08; 1 female, 18/II/09.

Odontobracon niger Marsh 1988

Distribution. Reported from Costa Rica, El Salvador and Mexico (Marsh, 1988, 2002). In Mexico it is reported from Estado de Mexico, Chiapas, Jalisco, Nayarit, Veracruz, and Oaxaca (Marsh, 1988); Yucatan is a new state record.

Flight period: August and November.

Material examined. SDV: 1 female, 18/VIII/08; TDF: 1 female, 26/XI/08.

Odontobracon nigriceps Cameron 1887

Distribution. Nearctic and Neotropical, collected in Costa Rica, El Salvador, Guatemala, Mexico and United States (Cameron, 1887; Rohwer, 1917; Krombein and Hurd, 1979; Marsh, 1970, 1988, 2002; Shenefelt and Marsh, 1976; Coronado *et al.,* 2004;). In Mexico is reported from Nayarit, Oaxaca, San Luis Potosí, Sinaloa, Sonora and Veracruz (Marsh, 1988). Yucatan is a new state record.

Flight period: January, April–July, September–October and December.

Material examined. SDV: 1 female, 17/VI/08; 1 female, 2 male, 10-24/IX/09; 1 female, 23/XII/08; 1 female, 07/I/09; 1 male, 29/IV/09; 1 female, 27/V/09; S: 3 female, 01-14/VII/08; 1 female, 24/IX/08; 1 female, 1 male, 08/X/08; 1 female, 21/I/09; TDF: 1 female, 17/VI/08.

**Pedinotus variegatus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico. Flight period: January.

Material examined. TDF: 1 female, 07/I/09.

**Pioscelus bicolor* (Barbalho and Penteado-Dias) 1999

Distribution. Wide distribution, from Costa Rica to Brazil (Barbalho *et al.,* 1999; Marsh, 2002). Yucatan is the northern-most record.

Flight period: March–April, June, August, and October.

Material examined. SDV: 2 female, 23/XII/08; 1 female, 18/III/09; 1 female, 1 male, 29/IV/09; 1 female, 24/VI/09; S: 1 female, 08/X/08; 5 female, 2 male, 07/I-15/IV/09; TDF: 5 female, 28/VIII/08-18/III/09.

**Pioscelus costaricencis* (Marsh) 2002

Distribution. Neotropical, only recorded from Costa Rica and Panama (Marsh, 2002). This is the first report for Mexico.

Flight period: February–May and November.

Material examined. SDV: 1 female, 10/XI/08; 2 female, 18/II/09; TDF: 1 male, 18/III/09; 1 female, 15/IV/09; 1 male, 27/V/09.

**Platydoryctes duckensis* Barbalho and Penteado-Dias 2000

Distribution. Described originally from Brazil (Barbalho and Penteado-Dias, 2000), previously reported from Costa Rica by Marsh (2002). This is the first report for Mexico.

Flight period: April and June.

Material examined. SDV: 1 female, 03/VI/08; TDF: 1 male, 15/IV/09.

**Platydoryctes soaresi* Barbalho and Penteado-Dias 2000

Distribution. Only recorded from Brazil (Barbalho and Penteado-Dias, 2000). This is the first report for Mexico.

Flight period: April.
Material examined. S: 1 male, 15/IV/09.

**Psenobolus ficarius* Ramirez and Marsh 1996

Distribution. Neotropical, only recorded from Costa Rica and Panama (Marsh, 2002; Ramirez and Marsh, 1996). This is the first report for Mexico.
Flight period: March, May, August and October.
Material examined. SDV: 2 female, 08-22/X/08; 1 female, 18/III/09; S: 1 female, 18/III/09; TDF: 1 female, 13/V/09; 1 female, 06/VIII/09.

**Rhaconotus chrysochaitus* Marsh, 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.
Flight period: January–June and December.
Material examined. SDV: 1 female, 03/VI/08; 1 male, 10/XII/08; S: 1 female, 21/I/09; 1 female, 18/II/09; 2 female, 04-18/III/09; 4 female, 1 male, 01-29/IV/09; TDF: 1 male, 07/I/09; 2 female, 15-29/IV/09; 2 male, 27/V/09; 1 female, 10/VI/09.

Rhaconotus emarginatus Marsh 2002

Distribution. *Rhaconotus emarginatus* has a wide distribution in the New World. It is reported from Costa Rica, El Salvador, Mexico and Venezuela (Marsh, 2002). The material from Mexico was collected in Veracruz. Yucatan is a new state record.
Flight period: April–May.
Material examined. S: 1 female, 15/IV/09; TDF: 2 female, 13-27/V/09.

Rhaconotus rugosus Marsh 2002

Distribution. This species has been collected from Costa Rica and Mexico (Marsh, 2002). Material from Mexico is from Chiapas and San Luis Potosi. Yucatan is a new state record.
Flight period: January, March–August and December.
Material examined. SDV: 2 female, 10/VI/09; S: 1 female, 23/XII/08; 3 female, 18/III/09; 1♀, 01/IV/09; 1 female, 27/V/09; TDF: 2 female, 17/VI/08; 1 male, 12/VIII/08; 1 female, 07/I/09; 2 female, 1 male, 15-29/IV/09; 1 male, 27/V/09; 1 male, 24/VI/09; 1 male, 08/VII/09.

**Spathius albocoxus* Marsh 2002

Distribution. Neotropical, only recorded from Costa Rica (Marsh, 2002). This is the first report for Mexico.
Flight period: October.
Material examined. SDV: 1 female, 08/X/08.

Stenocorse bruchivora (Crawford) 1909

Distribution. A wide distribution, from Nearctic and Neotropical regions: Costa Rica, Guatemala, Hawaii, Honduras, Mexico, Nicaragua, Panama, Peru, United States and Venezuela (Crawford, 1909; Marsh, 1968, 2002; Shenefelt and Marsh, 1976; Krombein and Hurd, 1979; Hetz and Johnson, 1988; Redolfi, 1994; Lopez-Martinez *et al.,* 2003; Coronado *et al.,* 2004). In Mexico this species is reported from Baja California Sur, Campeche, Chiapas, Colima, Estado de Mexico, Guanajuato,

Guerrero, Jalisco, Michoacán, Morelos, Nayarit, Oaxaca, Quintana Roo, Sinaloa, Sonora, Veracruz and Yucatan. The RLBR is a new locality record.

Flight period: February, April–August and October.

Material examined. SDV: 1 female, 28/VII/08; 1 female, 13/V/09; S: 1 female, 04/II/09; 1 female, 15/IV/09; 1 female, 10/VI/09; 1 female, 08/VII/09; TDF: 1 female, 12/VIII/08; 1 female, 22/X/08; 1 female, 29/IV/09; 2 female, 23/VI/09.

Discussion

For the first time, a checklist of two subfamilies of braconid wasp is presented for a particular region in Yucatan, Mexico: 83 species belonging to 29 genera are reported for the Ría Lagartos Biosphere Reserve, increasing the number of braconid species for RLBR from 1 to 84.

Previous to this work, only 107 Agathidinae and 39 Doryctinae species were recorded for Mexico (López-Martínez *et al.,* unpubl. data.). Here, 62 species are reported for the first time for the country, increasing by approximately 10% the Mexican braconid fauna.

The braconid subfamily Doryctinae is a diverse group in the New World tropics (Barbalho *et al.,* 1999), with many new genera and species recently described. Previous research indicates that many doryctine morphospecies occur in Mexican tropical forests (Chay-Hernández *et al.,* 2006; Zaldívar-Riverón *et al.,* 2010). Here we show that the same is true in Yucatan State.

The diversity of Braconidae in Mexico still largely unknown; for example, there are two times more Ichneumonidae wasps recorded than there are braconids (see data in Morrone and Márquez, 2008). Ongoing studies being conducted in many areas of Mexico will improve this status over the coming years and decades.

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Literature Cited

Arriaga, L., J. M. Espinoza, C. Aguilar, E. Martínez, L. Gómez, and E. Loa. (Coordinators). 2002. Regiones Terrestres prioritarias de México. Comisión Nacional para el Conocimiento y uso de la Biodiversidad, México.

Ashmead, W. H. 1895 [1894]. Some parasitic Hymenoptera from Lower California. Proceedings of California Academia of Sciences 4:122–129.

Ashmead, W. H. 1889. Descriptions of new Braconidae in the collection of the U.S. National Museum. Proceedings of the United States National Museum 11(1888):611–671.

Ashmead, W. H. 1900. Classification of the ichneumon flies, or the superfamily Ichneumonoidea. Proceedings of the United States National Museum 23:1–220.

Barbalho, S. M., A. M. Penteado-Dias, and P. M. Marsh. 1999. Descriptions of new genera from Brazil in the tribes Heterospilini and Spathiini with similar venation (Hymenoptera: Braconidae, Doryctinae). Journal of Hymenoptera Research 8(2):139–153.

Barbalho, S. M., and A. M. Penteado-Dias. 2000. *Platydoryctes*, a new Doryctinae genus from Brazil (Hymenoptera: Braconidae). Entomological News 111(1):25–31.

Berta de Fernández, D. C. 1998. Contribución al conocimiento del género *Cremnops* Foerster, 1862 (Braconidae, Agathidinae) en la región Neotropical. Acta Zoológica lilloana 44(19):231–288.

Braet, Y., and J. Fretey. 1997. Species of Braconidae (Hymenoptera) collected in French Guiana with description of two new species. Bulletin et Annales de la Societe Royale Belge d'Entomologie 133:363–374.

Brokaw, N., N. Bonilla, S. Knapp, A. L. MacVean, J. J. Ortiz, M. Peña-Chocarro, E. De Pöll, and J. Tun-Garrido. 2006. Arboles del mundo Maya. Versión en CD. Museo de Historia Natural de Londres. Gran Bretaña.

Brues, C. T. 1907. Notes and descriptions of North American parasitic Hymenoptera. IV. Bulletin of the Wisconsin Natural History Society 5:96–111.

Cameron, P. 1887. Insecta. Hymenoptera (Families Tenthredinidae-Chrysididae). Vol. 1. Biologia Centrali-Americana 33:1–487.

Chay-Hernández, D. A., H. Delfín-González, and V. Parra-Tabla. 2006. Ichneumonoidea (Hymenoptera) community diversity in an agricultural environment in the state of Yucatan, Mexico. Environmental Entomology 35(5):1286–1297.

Comisión Nacional de Áreas Naturales Protegidas (CONANP). 2007. Reserva de la Biósfera Ría Lagartos. Programa de Conservación y Manejo, México, D. F. 266 pp.

Coronado, B., J. M., E. Ruíz C, and S. E. Varela F. 2004. Adenda a Braconidae (Hymenoptera). *In* B. J. Llorente, J. J. Morrone, O. Yáñez O, and I. Vargas F (eds.). Biodiversidad, Taxonomía y Biogeografía de Artrópodosde México. Vol. IV, pp. 713–720. UNAM, Mexico, D. F. x + 790 pp.

Crawford, J. C. 1909. New parasitic Hymenoptera. Proceedings of the Entomological Society of Washington 9:203–207.

Cresson, E. T. 1865. On the Hymenoptera of Cuba. Proceedings of the Entomological Society of Philadelphia 4:1–200.

Cué-Bär, E. M., J. L. Villaseñor, J. J. Morrone, and G. Ibarra-Manríquez. 2006. Identifying priority areas for conservation in Mexican tropical deciduous forest based on tree species. Interciencia 31(10):712–719.

Delfín, G. H., and R. A. Wharton. 2000. Historical review of the genera *Aleiodes* and *Rogas*in Mexico, with a redescription of *Aleiodes cameronii* (Hymenoptera: Braconidae). Pan-Pacific Entomologist 76(1):58–70.

Delfín, G. H., and R. A. Wharton. 2002. Distribution of species and species-groups of *Aleiodes* (Hymenoptera: Braconidae) in Mexico. Folia Entomológica Mexicana 41(2):215–227.

Delfín, G. H., D. Chay H, A. González M, L. Hernández P, and C. Suárez C. 2002. New records of Braconidae (Hymenoptera) subfamilies and genera from Mexico and the state of Yucatan. Transactions of the AmericanEntomological Society 128(1):99–108.

Enderlein, G. 1912. ZurKenntnis der Spathiinen und einigerverwandter Gruppen. Archivfür Naturgeschichte 78A(2):1–37.

Enderlein, G. 1920 [1918]. ZurKenntnis auβereuropäischerBraconiden. Archiv fur Naturgeschichte 84(A)11:51–224.

Fraga, J. 2006. Local perspectives in conservation politics: the case of the Ría Lagartos Biosphere Reserve, Yucatán, México. Landscape and Urban Planning 74:285–295.

Hetz, M., and C. D. Johnson. 1988. Hymenopterous parasites of some bruchid beetles of North and Central America. Journal of Stored Products Research 24(3):131–143.

Krombein, K. V., and P. D. Hurd. 1979. Catalog of Hymenoptera in America North of Mexico. Vol. 1 Symphyta and Apocrita (Parasitica). Smithsonian Institution Press, Washington, D. C. xvi + 1198 pp.

Kula, R. R., K. S. Knight, J. Rebbeck, L. S. Bauer, D. L. Cappaert, and K. J. K. Gandhi. 2010. *Leluthia astigma* (Ashmead) (Hymenoptera: Braconidae: Doryctinae) as a parasitoid of *Agrilus planipennis* Fairmaire (Coleoptera: Buprestidae: Agrilinae), with an assessment of host associations for Nearctic species of *Leluthia* Cameron. Proceedings of the Entomological Society of Washington 112(2):246–257.

Leathers, J. W., and M. J. Sharkey. 2003. Taxonomy and life history of Costa Rican *Alabagrus* (Hymenoptera: Braconidae), with a key to world species. Contributions in Science 497:1–82.

Lindsay, C. L., and M. Sharkey. 2006. Revision of the genus *Amputoearinus* (Hymenoptera: Braconidae: Agathidinae) with fourteen new species. Zootaxa 1329:1–27.

López-Martínez, V., J. I. Figueroa-De la Rosa, and J. Romero-Nápoles. 2003. Registro de un nuevo huésped para *Stenocorse bruchivora* (Crawford) (Hymenoptera: Braconidae) con notas de su distribución en México. Acta Zoológica Mexicana (n. s.) 89:287–289.

López-Martínez, V., M. Saavedra-Aguilar, H. Delfín-González, J. I. Figueroa-De la Rosa, and M. de J. García-Ramírez. 2009. New Neotropical distribution records of braconid wasps (Hymenoptera: Braconidae). Neotropical Entomology 38(2):213–218.

Marsh, P. M. 1961. A taxonomic study of the genus *Cremnops* Foerster in America North of Mexico (Hymenoptera: Braconidae). Annals of the Entomological Society of America 54:851–861.

Marsh, P. M. 1965. The Nearctic Doryctinae, I. A review of the subfamily with a taxonomic revision of the tribe Hecabolini (Hymenoptera: Braconidae). Annals of the Entomological Society of America 58(5):668–699.

Marsh, P. M. 1967. The Nearctic Doryctinae, V. The genus *Leluthia* and comments on the status of the tribe Hecabolini. Proceedings of the Entomological Society of Washington 69(4):359–364.

Marsh, P. M. 1968. The Nearctic Doryctinae, VI. The genera *Acrophasmus*, *Glyptocolastes*, *Doryctinus*, and a new genus, *Stenocorse*. Proceedings of the Entomological Society of Washington 70(2):101–113.

Marsh, P. M. 1970. The Nearctic Doryctinae, IX. The genus *Odontobracon* and notes on related genera. Pan Pacific Entomologist 46(4):275–283.

Marsh, P. M. 1988. Revision of the Tribe Odontobraconini in the Western Hemiphere (Hymenoptera: Braconidae: Doryctinae). Systematic Entomology 13:443–464.

Marsh, P. M. 1993. Descriptions of new Western Hemisphere genera of the subfamily Doryctinae (Hymenoptera: Braconidae). Contributions of the American Entomological Institute 28(1):1–58.

Marsh, P. M. 2002. The Doryctinae of Costa Rica (excluding the genus *Heterospilus*). Memoirs of the American Entomological Institute 70:1–229.

Morrison, H. 1917. Monograph of the Neartic Hymenoptera of the genus Bracon Fabricius. Proceedings of the United States National Museum 52(2173):305–343.

Morrone, J. J., and J. Márquez. 2008. Biodiversity of Mexican terrestrial arthropods (Arachnida and Hexapoda): a biogeographical puzzle. Acta Zoologica Mexicana (n.s.) 24(1):15–41.

Muesebeck, C. F. W. 1927. A revision of the parasitic wasps of the subfamily Braconinae ocurring in America north of Mexico. Proceedings of the United States National Museum 2642:1–73.

Portuondo, F., E., and J. L. Fernández T. 2004. Biodiversidad del orden Hymenoptera en los macizos montañosos de Cuba Oriental. Boletín Sociedad Entomológica Aragonesa 35:121–136.

Pucci, T., and M. Sharkey. 2004. A revision of *Agathirsia* Westwood (Hymenoptera: Braconidae: Agathidinae) with notes on mouthpart morphology. Journal of Hymenoptera Research 13(1):64–107.

Ramirez, B., W., and P. M. Marsh. 1996. A review of the genus *Psenobolus* (Hymenoptera: Braconidae) from Costa Rica, an inquiline fig wasp with brachypterous males, with description of two new species. Journal of Hymenoptera Research 5:64–72.

Redolfi de H, I. 1994 [1995]. Diversidad de Braconidae (Hymenoptera) en el Perú. RevistaPeruana de Entomología 37:11–22.

Riley, C. V., W. H. Ashmead, and L. O. Howard. 1894. Report upon the parasitic Hymenoptera of the island of St. Vincent. Linnean Society's Journal-Zoology 25:56–254.

Rohwer, S. A. 1913. Descriptions of thirteen new species of parasitic Hymenoptera and a table to certain species of the genus *Ecphylus*. Proceedings of the United States National Museum 45(1991):533–540.

Rohwer, S. A. 1917. Descriptions of thirty-one new species of Hymenoptera. Proceedings of the United States National Museum 53(2195):151–176.

Ruiz C, E., L. O. Tejada M, and M. R. Cantú T. 1990. Contribución al conocimiento de los bracónidos (Hymenoptera) de Tamaulipas y Nuevo León, México. Folia Entomológica Mexicana 78:199–208.

Ruiz C, E., D. R. Kasparyan, J. Ma. Coronado B, S. N. Myartseva, V. A. Trjapitzin, S. G. Hernández A, and J. García J. 2010. Himenópteros de la Reserva ''El Cielo'', Tamaulipas, México. Dugesiana 17(1):53–71.

Sharkey, M. J. 1988. A taxonomic revision of *Alabagrus* (Hymenoptera: Braconidae). Bulletin of the British Museum (Natural History) 57(2):311–437.

Sarkey, M. J. 1990. A revision of *Zacremnops* Sharkey and Wharton (Hymenoptera: Braconidae: Agathidinae). Proceedings of the Entomological Society of Washington 92(3):561–570.

Shenefelt, R. D. 1970. Pars 6. Braconidae 3, Agathidinae. *In* Ch. Ferrière and J. van der Vecht (eds.). Hymenopterorum Catalogus (nova editio), pp. 307–427. Dr. W. Junk, The Hague. 428 pp.

Shenefelt, R. D., and P. M. Marsh. 1976. Pars 13. Braconidae 9, Doryctinae. *In* J. van der. Vecht and R. D. Shenefelt (eds.). Hymenopterorum Catalogus (nova editio), pp. 1263–1424. Dr. W. Junk, The Hague. 1424 pp.

Szépligeti, G. 1902. Tropischen Cenocoeliden und Braconidenaus der Sammlung des Ungarischen National-Museums. TermeszetrajziFuzetek 25:39–84.

Tobias, V. I. 1967. A review of the classification, phylogeny and evolution of the family Braconidae (Hymenoptera). Entomological Review 46:387–399.

Wharton, R. A. 1993. Bionomics of the Braconidae. Annual Review of Entomology 38:121–143.

Wharton, R., P. Marsh, and M. Sharkey. 1997. Manual of the New World Genera of the Family Braconidae (Hymenoptera). Special Publication International Society Hymenopterists No. 1, Washington, D. C. 439 pp.

Wharton, R. A., and I. Mercado. 2000. Braconidae (Hymenoptera). *In* B. J. Llorente, E. González S, and N. Papavero (eds.). Biodiversidad, taxonomía y biogeografíade artrópodos de México. Vol. II, pp. 635–647. UNAM-CONABIO Bayer, México.

Zaldívar-Riverón, A., and S. A. Belokobylskij. 2009. The parasitic wasp genus *Hecabolus* (Hymenoptera: Braconidae: Doryctinae), with the description of a new species from Mexico. Revista Mexicana de Biodiversidad 80:419–429.

Zaldívar-Riverón, A., J. J. Martínez, F. S. Ceccarelli, V. S. De Jesús-Bonilla, A. C. Rodríguez-Pérez, A. Reséndiz-Flores, and M. A. Smith. 2010. DNA barcoding a highly diverse group of parasitoid wasps (Braconidae: Doryctinae) from a Mexican nature reserve. Mitochondrial DNA 21(S1):18–23.