

SYSTEMATICS, MORPHOLOGY AND PHYSIOLOGY

New Neotropical Distribution Records of Braconid Wasps
(Hymenoptera: Braconidae)VÍCTOR LÓPEZ-MARTÍNEZ¹, MARIO SAAVEDRA-AGUILAR², HUGO DELFÍN-GONZÁLEZ³, J I FIGUEROA-DE LA ROSA⁴, MARÍA DE J GARCÍA-RAMÍREZ⁵

¹Univ. Autónoma del Estado de Morelos, Facultad de Ciencias Agropecuarias, Av. Universidad 1001, col. Chamilpa, C. postal 62209, Cuernavaca Morelos; vilomar74@yahoo.com.mx; ²Colegio de Postgraduados, Campus Montecillo, Programa en Entomología y Acarología. Carretera México-Texcoco km 36.5, C. postal 56230, Montecillo, Edo. de México; ³Univ. Autónoma de Yucatán, Facultad de Medicina, Veterinaria y Zootecnia, Carr. Mérida-Xmatkuil km 15.5, Apdo. postal 4-116, Itzinná, Mérida, Yucatán; ⁴Instituto de Investigaciones Agropecuarias y Forestales, Universidad Michoacana de San Nicolás de Hidalgo, km. 9.5 carretera Morelia-Zinapequero, Tarimbaro, Michoacán, 58880, México; ⁵Univ. Autónoma de Campeche, Escuela Superior de Ciencias Agropecuarias, Calle 53 S/Nx18, Col. Unidad, Esfuerzo y Trabajo n. 2, Escárcega, Campeche, México

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Nuevos Registros de Distribución Neotropical de Avispas Bracónidas (Hymenoptera: Braconidae)

RESUMEN - Se proporciona nueva información de distribución geográfica para 22 especies de las subfamilias Agathidinae, Braconinae, Helconinae, Homolobinae y Rogadinae (Hymenoptera: Braconidae) de Brasil, Chile, Costa Rica, Guatemala, México y Panamá. Se reporta por primera vez a *Agathirsia ninesevenci* Pucci & Sharkey en México; *Homolobus acares* van Achterberg, *H. antefurcalis* van Achterberg y *H. infumator* (Lyle) en Costa Rica; *Triaspis kurtogaster* Martin en Brasil, Costa Rica y Panamá. *Sabulodes caberata* Guenée (Lepidoptera: Geometridae) es registrado como huésped de *Homolobus infumator* (Lyle).

PALABRAS CLAVES: Biodiversidad, neotrópico, parasitoide, nuevo registro

ABSTRACT - New distribution records of 22 braconid species belonging to Agathidinae, Braconinae, Helconinae, Homolobinae and Rogadinae subfamilies from Brazil, Chile, Costa Rica, Guatemala, Mexico and Panama are presented. *Agathirsia ninesevenci* Pucci & Sharkey is reported for the first time from Mexico; *Homolobus acares* van Achterberg, *H. antefurcalis* van Achterberg and *H. infumator* (Lyle) from Costa Rica; *Triaspis kurtogaster* Martin from Brazil, Costa Rica and Panama. *Sabulodes caberata* Guenée (Lepidoptera: Geometridae) is recorded as a new host for *Homolobus infumator* (Lyle).

KEY WORDS: Biodiversity, Neotropics, parasitoid, new record

The family Braconidae (Insecta: Hymenoptera) can be used as a parameter group to estimate biodiversity in natural and disturbed ecosystems (Delfin & León 1997, Delfin & Burgos 2000, Chay-Hernandez *et al* 2006). However, studies on the Neotropical fauna are reduced in comparison with the Nearctic region, and only a fraction of the Costa Rican and Mexican species are known (Figueroa-De la Rosa *et al* 2003): in Mexico there are indications of 300 to 544 species distributed in the country (Sánchez *et al* 1998, Wharton & Mercado 2000, Coronado *et al* 2004), similar situation exist in the rest of the New World.

Latin American braconologists are still reduced in number, but the potential to generate data from this hymenopteran family is constantly increasing (see the

revision of Ghahari *et al* 2006). In the revision of Mexican *Homolobus* species, we received and checked specimens from foreign and Mexican entomological collections. The analysis of this material revealed new distribution records for 22 braconids to different geographical level, increasing our data of this family in the neotropics with specimens from Brazil, Chile, Costa Rica, Mexico and Panama.

Material and Methods

The material revised is housed in the following entomological collections: CAS, California Academy of Sciences; CNC, Canadian National Collection of Insects,

Arachnids and Nematodos, Ottawa; CEAM, Colegio de Postgraduados, Montecillos; CUIC, Cornell University Insect Collection, Ithaca; EMEC, Essig Museum of Entomology, Berkeley; INBIO, Instituto Nacional de Biodiversidad, Santo Domingo de Heredia; RMSEL, Rocky Mountain Systematic Entomology Laboratory, University of Wyoming, Laramie; CER-UADY, Universidad Autónoma de Yucatán, Xmatkuil; and UCR, University of California Riverside, Riverside. The material was determined using the keys of van Achterberg (1979) for *Homolobus* and *Exasticolus*; Shaw *et al* (1997), Marsh and Shaw (1999, 2001) for *Aleiodes*; Pucci & Sharkey (2004) for *Agathirsia*; Sharkey (1990) for *Zacremnops*; Inayatullah *et al* (1998) for *Vipio*; van Achterberg (1995) for *Choreborogas*, and López & Romero (2004) for *Triaspis*.

Results and Discussion

Subfamily Agathidinae

Agathirsia fulvocastanea Westwood

Distribution: Mexico. This species was described from one single specimen (female) without data on the collecting site (Pucci & Sharkey 2004). In here, we report the occurrence of this species in Central Mexico.

Material examined: MEXICO. Estado de Mexico: one ♀, Chapingo, 28-IX-1962, F Pacheco M (CEAM).

Agathirsia ninesevenci Pucci & Sharkey

Distribution: USA and México. This parasitoid species was recorded in the USA in October (Pucci & Sharkey 2004). This is the first report in Mexico. Flight period was recorded from August to September.

Material examined: MEXICO. Estado de Mexico: nine ♂, Texcoco, 15-VIII-1995, col. Jesús Romero N, en avena (CEAM); (specimen without abdomen) same data, except, 8-IX-1982; Tlaxcala: 1 ♂, San Marcos, 26-VIII-1973, col. William Olarte E (CEAM).

Agathirsia proxima Westwood

Distribution: Northern and central Mexico (Durango, Jalisco, Nayarit, Estado de Mexico, Puebla, Guerrero, Morelos) (Pucci & Sharkey 2004). A new record for Morelos State is presented.

Material examined: MEXICO. Morelos: one ♂, Xochicalco, pirámides, 7-X-1995, Alma R Valle, maleza (CEAM).

Agathirsia reai Pucci & Sharkey

Distribution: Central Mexico (Morelos and Puebla) (Pucci & Sharkey 2004). Its distribution expanded to eastern (Guanajuato) and southern (Oaxaca) Mexico. Main flight activity period recorded was September, but can be also collected in October.

Material examined: MEXICO. Guanajuato: one ♂, Celaya, La Laja, 24-IX-1995, José A. Sánchez G., veg. orilla de río (CEAM); Morelos: one ♂, Reserva Huautla, 3 km S Valle de Vázquez, 1-X-2000, 18° 30'35" N 99°04'56" W, Jesús Romero Nápoles (CEAM); Oaxaca: one ♂, El Camaron, km 672, 29-IX-1961, Jorge Navarro T (CEAM); Puebla

(new locality): one ♂, Acatlán, 30-IX-1961, F Pacheco M (CEAM).

Agathirsia rufula Westwood

Distribution: According to Pucci & Sharkey (2004), this species is distributed in the Estado de Mexico, Puebla, Hidalgo and Morelos; Veracruz is a new state record for Mexico.

Material examined: MEXICO. Estado de Mexico (new localities): two ♂, Texcoco, Chapingo, 14-V-1996, col. L Sánchez, alfalfa (CEAM); one ♂ Texcoco, 22-VIII-1981, Mateo Ruiz V, 2240 msnm, al vuelo (CEAM); Veracruz: one ♂ Hidalgotitlán, 2-XI-1992, Reyes Mtz. Artemio (CEAM).

Agathirsia sericans (Westwood)

Distribution: Southern, central and western Mexico (Jalisco, Michoacán, Durango, Estado de Mexico, Guerrero, Puebla, Morelos, Nayarit) (Pucci & Sharkey 2004). Morelos is a new state record for Mexico.

Material examined: MEXICO. Morelos: one ♂, Cuautla, 23-IX-1962, C G Martell (CEAM).

Zacremnops cressoni (Cameron)

Distribution: Sharkey (1990) appoints the existence of two morphotypes, the material here revised presents the ventral area of hind femur with punctures sparse in its surface, corresponding to the specimens previously observed by Sharkey from Yucatán (Mexico), USA and the Greater Antilles.

Material examined: GUATEMALA. one ♂ Estancia de la Virgen, 11-VIII-1965, Alberto Ortiz (CEAM); MEXICO. Chiapas: two ♂, Chiapa de Corzo, 25-IX-1961, F Pacheco M (CEAM); one ♂ Colima, Manzanillo, Playa Santiago, 30-VIII-1962, F Pacheco M (CEAM); Estado de Mexico: 1♂, Montecillo, Alfalfa, 12/VI/1993. J Araya G (CEAM); Hidalgo: 1♀, Zimapan, 10 km NW de Garabato, 8/X/1996 (CEAM); Jalisco: one ♂, Est. Biol. Chamela, 4-5/VII/1993, Wharton & Sharkey, malaise trap (CER-UADY); Veracruz: one ♀, km 92 Cord.-Ver., 17-IX-1994. H. Taddei M., malezas (CEAM); Yucatán: one ♂, Celestún, 21/XI/95, H Delfin (CER-UADY); two ♂, Colonia Yucatán, Kalah-Dzonot, 21/IX/93, H. Delfin (CER-UADY); one ♀ and two ♂, Dzununcan, 13/XI/95, H. Delfin (CER-UADY); one ♀, Reserva de Dzilam, Rancho San Salvador, 30/IX/92, P Manrique (CER-UADY); three ♀ and eight ♂, Xmatkuil, 1-4/V/1996, H Delfin, F Leon (CER-UADY); one ♀ and three ♂, same data except, 28-31/V/1996 (CER-UADY); one ♀ and four ♂, same data except, 4-8/VI/96, T malaise, F León (CER-UADY); two ♂, same data except, 12-17/VI/96, H Delfin, F Leon, T malaise (CER-UADY); one ♀ and four ♂, same data except, Hda. Xmatkuil, 4-XI-97 (CER-UADY); one ♀ and four ♂, 9 km N Teya Pueblo, Ecotono SBC-Milpa, 4-VIII-1999, Malaise trap, C Suárez col. (CER-UADY); two ♂ same data except, 15-IX-1999 (CER-UADY).

Zacremnops ekchuah Sharkey

Distribution: Tropical and semitropical areas from Mexico to Costa Rica (Sharkey 1990), here we present new localities records from the Mexican State of Morelos.

Material examined: MEXICO. Morelos: one ♀ Cuautla, 4-IX-1988, A Huerta (CEAM); one ♀ Yautepec, Loc. Amado Salazar, 30-VIII-1980, col. J Romero N, posado en una compuerta, No. 6-1032(B) (CEAM); one ♂ Xochitepec, 13-VII-1965, Alberto Ortiz (CEAM); Yucatán: one ♂, Xmatkuil, 4-8/VI/96, T. Malaise, F León (CER-UADY).

Subfamily Braconinae

Vipio belfragei (Cresson)

Distribution: This species has a wide distribution in Mexico (Guerrero, Jalisco, Michoacán, Morelos, Oaxaca, Sinaloa, Sonora, Tabasco and Veracruz) and USA, with reports in Costa Rica and Panama. Flight period is from July to December (Inayatullah *at al* 1998). This is the first record in the Mexican State of Guanajuato.

Material examined: MEXICO. Guanajuato: one ♀, Andocutín, 6-VII-1996, José A Sánchez G, col. en maleza (CEAM).

Vipio mexicanus Inayatullah, Shaw & Quicke

Distribution: Mexico (Chiapas, Guanajuato, Guerrero, Sinaloa and Tabasco) and USA (Inayatullah *at al* 1998), Yucatán is the southern record of *V. mexicanus*.

Material examined: MEXICO. Yucatán: one ♀, Yaxnic, Mpio. de Mérida, 1-XI-2000, D Chay Hernández, Malaise trap, Selva Baja (CER-UADY).

Vipio piceipectus Viereck

Distribution: Canada, Mexico and USA; in Mexico there are only two state reports: Durango and the locality of Huichihuayan (possibly in San Luis Potosi State). *V. piceipectus* is variable in color (Inayatullah *at al* 1998), specimens revised here are different from the redescription of Inayatullah *at al* (1998) in the following characters: vertex and temple black, without mesonotal black spots and more sculptured tergites. Estado de Mexico, Michoacán, Morelos are the most southern records for the species.

Material examined: MEXICO. Estado de Mexico: one ♀, Tonatico, 13-VIII-1961, Hiram Bravo M. (CEAM); Michoacán: one ♂ Jungapeo, 2-VI-1968, F Pacheco (CEAM); Morelos: two ♂, Puente de Ixtla, Reserva Huatla, Camino al Salto, 1.5 km N de la Est. de Microondas, 3-VIII-2000, 18°27'54" N 99°16'30" O, 1645 msnm, J. Isaac Figueroa/Jesús Romero Nápoles (CEAM); one ♂, Reserva Huautla, Crucero Huautla, 28-V-2000, 18°32'41" N 99°03'56" O, 1045 msnm, J Isaac Figueroa/Jesús Romero Nápoles (CEAM); two ♂, Cuautla, 27-III-1961, F Pacheco M (CEAM).

Vipio shawi Inayatullah

Distribution: This species was collected only in USA and Mexico (Jalisco, Michoacán and Durango) (Inayatullah *at al* 1998); our report expands its distribution to the northern and central Mexico (Estado de Mexico, Sonora). Flight period is from August to October. The male specimen has the clypeal spot darker than the original species description.

Material examined: MEXICO. Estado de Mexico: one ♀, Chapingo, 25-X-1979, A Marín J, alfalfa (CEAM); Sonora: one ♂, Navojoa, 2-VIII-1957 (CEAM).

Subfamily Helconinae

Triaspis kurtogaster Martin

Distribution: Only reported from Canada, Mexico and USA (Martin 1956, Shenefelt 1970, López-Martínez *at al* 2003). The new data presented here extends this range into Central and South America (Brazil, Costa Rica and Panama).

Material examined: BRASIL. Bahia: one ♀, Encruzilhada, XI-1972, M Alvarenga, 960 m (CNC); one ♀, same data but XI-1974, 980 m (CNC); Mato Grosso: three ♀, Sinop, X-1976, M Alvarenga, Mal. Trap (CNC); Sao Paulo: one ♀, S. Bocaina, José Baleiro, II-1971, F M Oliveira, 1650 m. (CNC); Rondonia: one ♀, Rancho Grande, 62 km S Ariquemes, 12-22-XI-1991, E M Fischer, 10° 32' S, 62° 48' O (CNC); Minas Gerais: one ♀, Santa Barbara, Serrado Caraça, I-1970, F M. Oliveira (CNC); COSTA RICA. Guanacaste: one ♀, Estac. Mengo, S.W. Volcan Cacao, IX-X-1989, 1100 m (RMSEL); Puntarenas: one ♀, threekm SW Rincón, R. F. Golfo Dulce, VI-1991, Paul Hanson, 10 m (RMSEL); San Jose: one ♀ and one ♂, Zurqui de Moravia, V-1992, Col. Paul Hanson, 1600 m (RMSEL); PANAMA. one ♂, Barro Colorado Is., CZ, X-1982, H. Wolda (CNC).

Subfamily Homolobinae

Exasticolus fuscicornis (Cameron)

Distribution: Data on this parasitoid includes the Nearctic (Canada and USA) and Neotropical regions (Argentina, Bolivia, Brazil, Colombia, Costa Rica, Ecuador, Mexico, Panama, Paraguay, Peru, Sto. Domingo, Suriname). In Mexico, it was collected in Oaxaca, Veracruz and Tabasco. In Costa Rica, it was only recorded from Monteverde (van Achterberg 1979). The following are new state records for Costa Rica and Mexico.

Material examined: COSTA RICA. Prov. Cartago: one ♀, Quebrada Segunda, Tapantí, 1150-1300 msnm. VIII/1998. R Delgado (INBio; INB0003018978); Prov. Alajuela: one ♂, Guatuso, P N Volcán Tenorio, Estación El Pilón, 700 msnm, 15/V-16/VI-2002, G Carballo, Malaise (INBio; INB0003494995); MEXICO. Quintana Roo: one ♂, Valle Hermoso, Rancho No. 3. 19/VII/1993, Hugo Delfin. Light trap (CER-UADY); Yucatán: one ♂, Xmatkuil. 12-16/II/1996. F León. Malaise trap (CER-UADY).

Homolobus acares van Achterberg

Distribution: Scarcely collected, the only records were from USA (Arizona), Mexico (Durango, Guerrero, Veracruz) and Panama (van Achterberg 1979). This is the first report for the Costa Rican fauna.

Material examined: COSTA RICA. Prov. Puntarenas: three ♀, Buenos Aires, Estación Altamira, 1450 msnm, 5/VI-1/VII/1999, R Villalobos, Malaise (INBio: INB0003148976; INB0003148950; INB0003149024); one ♀, Buenos Aires, Estación Altamira, 1450 msnm, 18/IV-1/V/1999, R Villalobos, Malaise (INBio; INB0003042660); one ♀, Cerro Biolley, Estación Altamira, 1766 msnm, 23/IX-22/X/1998, R Villalobos, Malaise (INBio; INB0003061555); one ♂, P. Int. La Amistad, Estación Altamira, Cerro Biolley, 1766 msnm, 10-27/V/2002, D. Rubí (INBio; INB0003480069); Prov.

Cartago: one ♀, La Represa, Torre del ICE, 1800 msnm, XI/1997, R Delgado, Malaise (INBio; CRI002 596766).

Homolobus antefurcalis van Achterberg

Distribution: Scarcely collected, *H. antefurcalis* was recorded in Canada, Mexico and USA (van Achterberg 1979). In Mexico was recorded only in Durango. This is the first report from Costa Rica, its southernmost distribution record; Morelos is a new state record in Mexico.

Material examined: COSTA RICA. Provincia Limón: one ♀, P. I. La Amistad, Valle del Silencio, Est. Altamira, 2400 msnm, 13/X/2000, D Rubí, Light trap (INBio; INB0003319028); MEXICO. Morelos: one ♀, Alpanocan, 9/X/1987, Samuel R A; Hidalgo 54 ♀, 75 ♂, Malaise (CEAM).

Homolobus infumator (Lyle)

Distribution: Neotropical (Argentina, Bolivia, El Salvador, and Peru), Nearctic (Canada, Mexico, USA) and Palearctic region (van Achterberg 1979). Costa Rica is a new country record, and Baja California Sur is a new state report for Mexico. The Tulare County is a new locality report for California.

The hosts reported for *H. infumator* belong to Geometridae [*Lambdina fiscellaria* (Guenée), *L. somnaria* (Hulst), *Nepytia canosaria* (Walker), *Alcis repandata* (L.), *Lycia zonaria* (Denis & Schiff.), *Ematurga atomaria* (L.)] and Oecophoridae [*Agonopterix alstroemeriana* (Clerck)]. *Sabulodes caberata* Guenée is a Geometridae collected in avocado tree (*Persea americana*), and this represent a new host record for *H. infumator*.

Material examined: COSTA RICA. Provincia Limón: one ♀, P. I. La Amistad, 2406 msnm, 30/III/2003, R Delgado, Mercury light trap (INBio; INB0003714200); one ♀, Estación Cacao, lado SW del Volcán Cacao, 1400 msnm, XII/1998, R Blanco & C Chávez (INBio; CRI000148326); Prov. Puntarenas: one ♀, Cerro Frantzius, 2134 msnm, 16/XI/1997, R Villalobos, Malaise (INBio; CRI 002 413724); MEXICO. Baja California Sur: San Sebastián, 1/IV/1975, 26° 36' N, P. DeBach, Malaise (UCR). USA. California, 1 ♂, Lemon Cove, Tulare Co., 27/XII/1956, D. W. Ricker, ex. *Sabulodes caberata*, planta hospedera: aguacate (*Persea americana*), Ent. Res. Museum UCRC ENT 105019 (UCR).

Homolobus rectinervis van Achterberg

Distribution: This species has an austral distribution, reported only from Argentina and Chile (van Achterberg 1979). Here we present new local distribution records for the species in Chile.

Material examined: CHILE. Prov. Queb. de la Plata: two ♀, Santiago, Rinconada Maipú. 510 m, 3/IV/66, M E Irwin, Malaise, 30° 31' S, 70° 47' W (CAS); two ♀, Santiago, Rinconada Maipú. 510 m, 24/III/66, M E Irwin, Malaise, 30° 31' S, 70° 47' W (CAS); one ♀, Santiago, Maipú, 510 m, 12/III/66, M E Irwin, Malaise, 30° 30' S, 70° 55' W (CAS); Porv. Los Perales: one ♂, Valparaíso, río Marga Marga, 330 m, 3/II/1967, M E Irwin, 33° 08' S, 71° 18' W (CAS); Prov. Aconcagua: one ♂, Punta Puquen, Los Molles, 12/VIII/66, E. Schlinger, 32° 12' S, 71° 27' W (CAS); one ♀, Osorno 10 km E de Payahue, 26/I/1951, leg. Ross y Michelbacher (CAS);

Prov. Petrouhue: one ♀, Llanquihue 100 m, 15/XI/1966, E I Schlinger, Nothofagus forest (CAS); Prov. Nahuelbuta: one ♂, Malleco Natl. Park, 1200 m, 12/II/1967, Evert I Schlinger, 38° 01' S, 73° 13' W (CAS).

Homolobus truncator (Say)

Distribution: Widely collected in the New World, mainly from Canada, Mexico and USA, with reports from Cuba and Central America (Costa Rica, El Salvador, Guatemala, Panama) to Venezuela, but with Oriental and Palearctic records. In Mexico, it was collected in many localities from 14 states (Baja California Norte, Chiapas, Chihuahua, Coahuila, Durango, Estado de Mexico, Nuevo León, Oaxaca, Puebla, Sinaloa, Sonora, Tlaxcala, Veracruz, Zacatecas) (van Achterberg 1979); here we present two new state records from Mexico (Guerrero and Hidalgo), and new localities from Baja California Norte and Estado de Mexico.

Material examined: MEXICO. Baja California Norte: one ♀, 10 mi SE El Rosario, 31/III/1976, R. Morrison, Light trap (EMEC); Guerrero: one ♀, 6 km E Tixtla, 28/VII/1962, F Pacheco M (CEAM); Estado de Mexico: 1 ♀, Texcoco-Montecillo, 2220 msnm, 2/IX/1980, Maiz-Frijol, Anaya-Sánchez (CEAM); Hidalgo: 1 ♀, 2 ♀ Huasca de Ocampo, Rancho Santa Elena, 2480 msnm, 3/VI/2005, 20° 07' 52" N, 98° 31' 39" W, Contreras-Meléndez (CEAM).

Subfamily Rogadinae

Aleiodes atricornis (Cresson)

Distribution: This braconid was widely collected in the country (22 states, including Hidalgo), with reports in the USA (Delfín-González & Wharton 2000, 2002; Marsh & Shaw 2001). Here new distribution records in the Mexican state of Hidalgo are reported.

Material examined: MEXICO. Hidalgo: two ♀, Tasquillo, balneario Tzindejhé, 28-IX-2003, 20°30'52" N, 99°19'46" W, 1720 msnm, Col. Saavedra Aguilar M. (CEAM); one ♀, Datxho, 25-VI-1997, Raúl Beristain D. Colectado en Maíz; one ♀, Huejutla de Reyes, 24-IV-2004, Malaise trap, Col. Saavedra Aguilar M (CEAM).

Aleiodes politiceps (Gahan)

Distribution: This species was previously registered in Costa Rica, Mexico and USA (Marsh & Shaw 1999, Delfín-González & Wharton 2002). The records in Mexico are from the north, so the present data expand its distribution to the central Mexico.

Material examined: MEXICO. Hidalgo: two ♀, Huejutla de Reyes, 24-IV-2004, Malaise trap, Col. Saavedra Aguilar M (CEAM).

Choreborogas birostratus Whitfield

Distribution: This species was recorded only in Mexico, from the southern (Guerrero and Oaxaca), western (Colima and Michoacán) and northern (Tamaulipas) entities from the country (Whitfield 1990), Morelos and Yucatan are new records distribution of *C. birostratus* in Mexico, to the eastern and central areas.

Material examined: MEXICO. Morelos: two ♀ and one

♂, Reserva Huautla, camino a El Limón, 29-IX-2000, 18°28'22"N 99°00'58"W, 1280 msnm, Jesús Romero Nápoles (CEAM); Yucatán: one ♂, 9 km N Teya Pueblo, 8-II-2000, A González, tropical deciduous forest (CER-UADY).

Nearctic Braconidae are widely known in comparison with the Neotropics. Mexico and Costa Rica have been partially studied, and there are no modern catalogs of the braconid fauna for the rest of the Americas. The catalogs provided by De Santis (1967, 1980) and Costa Lima (1962) still are the major sources for the braconid fauna from South America.

The potential to use braconids in Integrated Pest Management programs is widely known, with many Neotropical species mentioned as natural enemies of important insect pests (for example Marsh 1984, Stary & Remaudière 1988, Shaw 1995, Llanderal-Cázares *et al* 2000, Sánchez & López 2000, Wharton & López-Martínez 2000). A more systematic approach and a continuous effort are necessary to increase data on host association and distribution of braconids in the Neotropical Region.

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