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HISTORICAL REVIEW OF THE GENERA *ALEIODES* AND *ROGAS* IN MEXICO, WITH A REDESCRIPTION OF *ALEIODES CAMERONII* (HYMENOPTERA: BRACONIDAE)

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Abstract.—A brief nomenclatural history is provided for the species of *Aleiodes* and *Rogas* previously recorded from Mexico. Variation in *Aleiodes cameronii* (Dalla Torre) is detailed to facilitate comparisons with other species, and its distribution in Mexico discussed. The presence of dorsal abdominal pits in male *Aleiodes* is reviewed, with new records for the *dispar* Curtis species group from Africa and Australia.

Key Words.—distribution, abdominal pits, Rogadinae, parasitoids.

Aleiodes Wesmael, 1838 is a cosmopolitan genus of parasitic wasps, all species of which are endoparasitoids of Lepidoptera. Species of *Aleiodes* have frequently been placed in *Rogas* Nees, 1834, though both generic names are now considered valid (van Achterberg 1991, Shaw 1997). Described species and known hosts are listed by Shenefelt (1975) and Fortier (1997). Shaw et al. (1997) recently provided a preliminary key to species groups for the Nearctic region.

In general, members from the western Palearctic and Nearctic regions are well known, but the Afrotropical, eastern Palearctic and Neotropical species of *Aleiodes* are poorly known. For example, there are 75 described species from the New World and close to 200 undescribed species (Shenefelt 1975, Marsh 1979, Shaw et al. 1997), with most of these described species from the Nearctic region. Except for the recent description of 7 species and a redescription of 12 species (Shaw 1993; van Achterberg & Penteado-Dias 1995; Shaw et al. 1997, 1998a, b; Marsh & Shaw 1998), most of the Neotropical species of *Aleiodes* are known only from limited original descriptions. The identity of these Neotropical species is further complicated by previous nomenclatural confusion involving application of generic names. Thus, prior to clarification of the status of *Rogas* and *Aleiodes* by van Achterberg (1982, 1991), some (e.g., Shenefelt 1975) or all (e.g., Lábougle 1980) of the species described in *Aleiodes* were placed in *Rogas*. Similarly, following van Achterberg's (1982) earlier work, many species formerly placed in *Rogas* were automatically transferred to *Aleiodes* by authors of regional lists and similar publications, without sufficient evidence to validate such changes. Correct placement of the described species will require a critical assessment of the applicability of the names *Rogas* and *Aleiodes* to the New World fauna, as is currently being done for Nearctic *Aleiodes* in the excellent treatments by Shaw et al. (1997, 1998a, b) and Marsh and Shaw (1998).

Our collections from Mexico indicate that the *Aleiodes* fauna is highly diverse, perhaps equivalent to the fauna of America north of Mexico. Yet, only a few species have previously been recorded from Mexico, and specific localities have rarely been mentioned. To provide a baseline for work on the biodiversity of the

Mexican fauna, and to clarify the status of certain names, the 22 species of *Aleiodes* and *Rogas* previously recorded from Mexico are listed below. We have used a catalog format, with information on their current status, previously recorded distribution within Mexico, prior combinations, and recent catalog listings (which should be consulted for additional localities outside Mexico). For localities listed by Cameron (1887), we have followed Selander and Vaurie (1962), thus correcting earlier records suggesting that the type locality of *Aleiodes cameronii* (Dalla Torre) was either in Veracruz or Texas. New combinations are made for a few of the species, when sufficiently diagnostic characters were mentioned in the original descriptions, or authoritatively determined material was available.

Abbreviations for specimen depositories are as follows: BMNH, British Museum of Natural History, London; CAS, California Academy of Sciences, San Francisco; CER—UADY, Colección Entomológica Regional de la Universidad Autónoma de Yucatán, Mérida; IB—UNAM, Instituto de Biologia, Universidad Autónoma de México, México City; ANSP, Philadelphia Academy of Natural Sciences, Philadelphia; TAMU, Texas A&M University Insect Collection, College Station; ZMPA, Polish Academy of Sciences, Warsaw.

Additionally, we redescribe *Aleiodes cameronii* (Dalla Torre), and use this opportunity to discuss distribution and characterization of the *pulchripes* Wesmael and *dispar* Curtis species groups. Terminology for the description follows van Achterberg (1991, 1993) and, for wing venation, Sharkey and Wharton (1997) and Shaw et al. (1997). Maximum width of head is measured in dorsal view across the eyes and across the temples immediately posteriorad the eyes. Quantitative values are based on a minimum of five specimens when no sexual dimorphism was evident. Voucher specimens of *A. cameronii* are deposited in TAMU.

Species of *Aleiodes* and *Rogas* Previously Recorded from Mexico

atriceps Cresson.

Aleiodes atriceps Cresson, 1869 Trans. Am. Ent. Soc. 2:380. Type locality: "Mexico." Holotype deposited ANSP (#1662.1).

Rhogas atriceps, Fox 1895:3.

Rogas atriceps, Shenefelt 1975:1218.

Dimorphomastax peculiaris Shenefelt, 1979:133.

Distribution.—MÉXICO. *BAJA CALIFORNIA SUR:* Margarita Is. (Fox 1895).

Remarks.—Shaw et al. (1998a) synonymized *peculiaris* with *atriceps*, uniting males with an enlarged, tooth-like outgrowth from the base of the mandible with more normal looking females. Shaw et al. (1998a) also transferred *atriceps* back to *Aleiodes*. Current valid combination: *Aleiodes atriceps* Cresson.

aztecus Cameron.

Rhogas aztecus Cameron, 1905 Trans. Am. Ent. Soc. 31:385. Type locality: "Mexico." Holotype depository unknown.

Rogas aztecus, Shenefelt 1975:1219.

Distribution.—MÉXICO (Cameron 1905); no specific localities published to date.

Remarks.—Generic placement needs verification. Current valid combination: *Rogas aztecus* Cameron.

burrus Cresson.
Aleiodes burrus Cresson, 1869 Trans. Am. Ent. Soc. 2:381. Type locality: "Illinois." Holotype deposited ANSP (#1670.1).
Rhogas burrus, Cameron 1887:224.
Rogas burrus, Muesebeck and Walkley 1951:170, Marsh 1979:179, Shenefelt 1975:1220.

Distribution.—MÉXICO (Cresson 1869); no specific localities published to date.

Remarks.—Transferred back to *Aleiodes* on basis of material examined during this study. Current valid combination: *Aleiodes burrus* Cresson, NEW STATUS.

cameronii Dalla Torre.
Rhogas mexicanus Cameron, 1887 Biol. Centr.-Am., Hym 1:389. Type locality: "Mexico, Presidio." Holotype deposited BMNH (#3.c.235).
Rhogas cameronii Dalla Torre, 1898 Cat. Hym. 4:216.
Rogas cameronii, Shenefelt 1975:1220.
Aleiodes cameronii, Shaw et al. 1997:17.

Distribution.—MÉXICO. *SINALOA:* Presidio (Cameron 1887). Shaw et al. (1997) record this species as occurring from southern U.S. through Mexico to Costa Rica, but do not give specific localities within Mexico. Additional localities are given below under the redescription of this species.

Remarks.—The name *cameronii* was proposed by Dalla Torre (1898) as a replacement name for *mexicanus* Cameron, 1887 (not *mexicanus* Cresson, 1869). Both nominal species are valid in *Aleiodes*. Current valid combination: *Aleiodes cameronii* (Dalla Torre).

enderleini Shenefelt: see *vaughani*.
fascipennis Cresson.
Aleiodes fascipennis Cresson, 1869 Trans. Am. Ent. Soc. 2:378. Type locality: "Mexico." Holotype deposited ANSP (#1665).
Rhogas fasciipennis, Dalla Torre 1898:218 (emendation).
Pelecystoma fasciipennis, Shenefelt 1975:1207.

Distribution.—MÉXICO (Cresson 1869); no specific localities published to date.

Remarks.—Current valid combination: *Rogas fascipennis* (Cresson), NEW STATUS.

ferrugineus Enderlein.
Rhogas ferrugineus Enderlein, (1918) 1920 Arch. Naturgesch. 84 A (11):156. Type locality: "Mexiko, Chiapas." Holotype deposited ZMPA.
Rogas ferrugineus, Shenefelt 1975:1229.

Distribution.—MÉXICO. *CHIAPAS* (Enderlein 1920). We have seen additional material of this widespread species from the following Mexican localities: MÉXICO. *AGUASCALIENTES:* 12.8 km NE of Aguascalientes; Calvillo. *CHIHUAHUA:* Santa Clara Canyon, 5 mi W Parrita. *COAHUILA:* 39 km S of Agua Nueva, 1.6 km SE of Saltillo. *COLIMA:* 14.4 & 16 km NE of Comala. *DISTRITO FEDERAL:* Primary and Tertiary Secc. Bosque de Chapultepec. *GUANAJUATO:* Ce-

laya; El Copal; Inchamacuaro; Las Trancas; Purisima de Bustos; Roque; San Bartolomé; Tarandácuaro; Tierra Blanca. *GUERRERO:* Iguala; 28.8 km S of Chilpancingo; 5 km W of Tixtla; 9.6 km NE of Tixtla. *HIDALGO:* Tulancingo. *JALISCO:* Guadalajara; 4.8 km SE of Plan de Barrancas; 10 km NE of Jalostotitlán; Sierra de Manantlán Lab. Mat. Las Joyas; Arroyo Las Joyas; Rancho La Quinta; Teocaltiche; Zapopan. *MÉXICO:* Chapingo; Tenango del Aire; Texcoco; Tonatico. *MICHOACAN:* Morelia; La Huerta; 4.8 km E of Carapan; 17.6 km W of Hidalgo; 19.2 km NW of Zitacuaro. *MORELOS:* Cuernavaca; 2.5 km N of Huautla Estación CEAMISH; Huejotengo; Tepoztlán; Yautepec. *NAYARIT:* Jesús María. *NUEVO LEÓN:* Linares. *OAXACA:* 12.8 km NE of El Punto; Oaxaca; 25.6 km NW of Totolapan; Puerto Escondido. *QUERETARO:* 11.2 km N of Querétero. *SAN LUIS POTOSI:* 17 km NE of Ciudad del Maíz; 59.2 km S of San Luis Potosi; 13.9 km S of Santa María del Río. *SINALOA:* Concordia. *TAMAULIPAS:* Hidalgo Conrado Castillo; Río Soto La Marina; Soto La Marina: *VERACRUZ:* 19 km NW of Ciudad Mendoza; 12.8 km S of Jalapa; Córdoba; Orizaba. *ZACATECAS:* Concepción del Oro; 6.4 km NE of Concepción del Oro.

Remarks.—Transferred to *Aleiodes* on basis of material examined during this study. Current valid combination: *Aleiodes ferrugineus* (Enderlein), NEW COMBINATION.

fumialis Shenefelt.

Rhogas fumipennis Cameron, 1887 Biol. Centr.-Am., Hym. 1:389. Type locality: "Mexico." Holotype deposited BMNH.

Rogas fumialis Shenefelt, 1975:1230.

Distribution.—MEXICO (Cameron 1887); no specific localities published to date.

Remarks.—The name *fumialis* was proposed by Shenefelt (1975) as a replacement name for *fumipennis* Cameron, 1887 (not *fumipennis* Cresson, 1869). Both nominal species belong in *Aleiodes*, though only *fumialis* is currently considered valid. Current valid combination: *Aleiodes fumialis* (Shenefelt), NEW COMBINATION.

fumipennis Cameron: see *fumialis.*

fumipennis Cresson: see *texanus.*

fusciceps Cresson.

Aleiodes fusciceps Cresson, 1869 Trans. Am. Ent. Soc. 2:382. Type locality: "Mexico." Holotype deposited ANSP (#1673).

Rhogas fusciceps, Dalla Torre 1898:218.

Pelecystoma fusciceps, Shenefelt 1975:1207.

Distribution.—MÉXICO (Cresson 1869); no specific localities published to date.

Remarks.—Current valid combination: *Rogas fusciceps* (Cresson), NEW STATUS.

laphygmae Viereck.

Rogas laphygmae Viereck, 1912 Proc. U.S. Natn. Mus. 43:581. Type locality: Texas, Brownsville. Holotype deposited USNM (#15012). Muesebeck and Walkley 1951:171; Shenefelt 1975:1236; Marsh 1979:180.

Distribution.—MÉXICO. *NUEVO LEÓN:* Marin. This species has been recorded from southern U.S. and Central America, but we know of no specific, published records from Mexico. This is a widespread species, however, and we list here a specific record for reliably determined specimens from Mexico in TAMU.

Remarks.—Current valid combination: *Aleiodes laphygmae* (Viereck), NEW COMBINATION.

melanocephalus Cameron.

Rhogas melanocephalus Cameron 1887 Biol. Centr.-Am., Hym. 1:391. Type locality: "Mexico, Cordova." Holotype deposited BMNH.

Macrostomion melanocephalus, Szépligeti, 1904:82.

Pelecystoma melanocephalum, Enderlein, 1920:148; Shenefelt, 1975:1208.

Distribution.—MÉXICO. *VERACRUZ:* Córdoba (Cameron 1887).

Remarks.—Current valid combination: *Rogas melanocephalus* Cameron. Generic placement needs verification.

mexicanus Cameron: see *cameronii*.

mexicanus Cresson.

Aleiodes mexicanus Cresson, 1869 Trans. Am. Ent. Soc. 2:378. Type locality: "Mexico." Holotype deposited ANSP (#1658).

Rhogas mexicanus, Dalla Torre 1898:216, 220.

Rogas mexicanus, Shenefelt 1975:1238.

Distribution.—MÉXICO. *CHIAPAS*, *SINALOA*, *VERACRUZ* (Shaw 1993). We have seen material from the following Mexican localities in addition to those listed by Shaw (1993): MÉXICO. *CHIAPAS:* 6.4 km SW of Simojovel. *MÉXICO:* Xilitla. *MORELOS:* Yautepec. *SAN LUIS POTOSI:* 16 km NE of entronque Rayón-Cárdenas. *TAMAULIPAS:* 3.5 km W of Gómez Farias. *TABASCO:* Teapa. *VERACRUZ:* Córdoba; Fortín de las Flores; Puente Nacional 7.2 km SE of Rinconada; 40 km S of Acayucan.

Remarks.—Shaw (1993) returned *mexicanus* to *Aleiodes*, including it in the subgenus *Eucystomastax* along with three other Neotropical species. Current valid combination: *Aleiodes mexicanus* Cresson.

molestus Cresson.

Rogas molestus Cresson 1872, Trans. Am. Ent. Soc. 4:188. Type locality: "Mexico." Holotype deposited USNM (#1625). Muesebeck and Walkley 1951:171, Shenefelt 1975:1239; Marsh 1979:180.

Rhogas molestus, Dalla Torre 1898:221.

Aleiodes molestus, Shaw et al. 1998a:70.

Rogas rufocoxalis Gahan 1917:207.

Distribution.—MÉXICO. *PUEBLA-OAXACA* (Labougle 1980). We have seen additional material of this widespread species from the following Mexican localities: MÉXICO. *AGUASCALIENTES:* 12.8 km NE of Aguascalientes. *CHIAPAS:* Las Rosas; Rancho Sánchez; San Cristobal de las Casas. *CHIHUAHUA:* Chihuahua. *JALISCO:* Rancho La Quinta; Teocaltiche. *MÉXICO:* Santa María; Tonatico; Valle de Bravo. *MICHOACAN:* 7.2 km N of Cheran; Jungapeo. *NAYARIT:* Jesús

María. *NUEVO LEÓN:* 8 km S of Linares. *TAMAULIPAS:* Hidalgo, Conrado Castillo. *VERACRUZ:* Veracrus.

Remarks.—Shaw et al. (1998a) synonymized *ruficoxalis* with *molestus*. Current valid combination: *Aleiodes molestus* (Cresson).

nigriceps Enderlein: see *vaughani.*

nigripes Enderlein.

Pelecystoma nigripes Enderlein (1918) 1920 Arch. Naturgesch. 84 A 11:148. Type locality: "Mexiko, Chiapas." Holotype deposited ZMPA. Shenefelt 1975: 1208.

Aleiodes nigripes, van Achterberg 1991:61.

Distribution.—MÉXICO. *CHIAPAS* (Enderlein 1920).

Remarks.—Current valid combination: *Aleiodes nigripes* (Enderlein).

nigristemmaticum Enderlein.

Rhogas nigristemmaticum Enderlein (1918) 1920 Arch. Naturgesch. 84 A (11): 156. Type locality: "Mexiko, Chiapas." Holotype deposited ZMPA.

Rogas nigristemmaticum, Wolcott 1948:759, Shenefelt 1975:1240.

Aleiodes nigristemmaticum, Marsh and Shaw (1998).

Distribution.—MÉXICO. *CHIAPAS* (Enderlein 1920). We have seen one additional Mexican specimen from the following locality: MÉXICO. *OAXACA:* 4.2 km NW of El Cameron.

Remarks.—Current valid combination: *Aleiodes nigristemmaticum* (Enderlein).

ornatus Cresson.

Aleiodes ornatus Cresson, 1869 Trans. Am. Ent. Soc. 2:380. Type locality: "Mexico." Holotype deposited ANSP (#1666).

Rhogas ornatus, Dalla Torre 1898:221.

Pelecystoma ornatus, Shenefelt 1975:1208.

Distribution.—MÉXICO (Cresson 1869); no specific localities published to date.

Remarks.—Current valid combination: *Rogas ornatus* (Cresson), but the generic name *Triraphis* Ruthe, 1855 may be more appropriate for this species.

peculiaris Shenefelt: see *atriceps.*

pedalis Cresson.

Aleiodes pedalis Cresson, 1869 Trans. Am. Ent. Soc. 2:379. Type locality: "Mexico." Holotype deposited ANSP (#1664).

Rhogas pedalis, Dalla Torre 1898:221.

Rogas pedalis, Shenefelt 1975:1242.

Distribution.—MÉXICO (Cresson 1869); no specific localities published to date.

Remarks.—Shaw et al. (1997) transferred *pedalis* back to *Aleiodes*. Current valid combination: *Aleiodes pedalis* Cresson.

rossi Marsh and Shaw.

Aleiodes rossi Marsh and Shaw, 1997 J. Hym. Res. 6:32. Type locality: Texas, Brownsville. Holotype deposited CAS.

Distribution.—MÉXICO. *SAN LUIS POTOSI:* El Salto (Shaw et al. 1997).
Remarks.—Current valid combination: *Aleiodes rossi* Marsh and Shaw.

rufocoxalis Gahan: see *molestus*.

scriptipennis Enderlein.

Heterogamus scriptipennis Enderlein, (1918) 1920 Arch. Naturgesch. 84 A (11): 152. Type locality: "Mexiko, Chiapas." Holotype deposited ZMPA, Shenefelt 1975:1202.

Distribution.—MÉXICO. *CHIAPAS* (Enderlein 1920).
Remarks.—Current valid combination: *Aleiodes scriptipennis* (Enderlein), NEW COMBINATION. The new combination is based on the current treatment of *Heterogamus* as a synonym of *Aleiodes* (van Achterberg 1991:24), but verification is needed.

sonorensis Cameron.

Rhogas sonorensis Cameron, 1887 Biol. Centr.-Am., Hym. 1:390. Type locality: "Mexico, Northern Sonora." Holotype deposited BMNH (#3.c.236).
Rogas sonorensis, Shenefelt 1975:1251.

Distribution.—MÉXICO: northern *SONORA* (Cameron 1887).
Remarks.—Current valid combination: *Aleiodes sonorensis* (Cameron), NEW COMBINATION. The combination proposed here is based on the original description only, and needs verification.

texanus Cresson.

Aleiodes texanus Cresson, 1869 Trans. Am. Ent. Soc. 2:378. Type locality: "Texas." Holotype deposited ANSP (#1655.1).
Rhogas texanus, Cresson 1887:224
Rogas texanus, Cresson 1872:188; Shenefelt 1975:1254.
Heterogamus texanus, Ashmead 1889:632.
Aleiodes fumipennis Cresson, 1869:378.

Distribution.—northern MÉXICO (Shaw et al. 1998b); no specific localities published to date.
Remarks.—Shaw et al. (1998b) synonymized *fumipennis* with *texanus*, and transferred *texanus* back to *Aleiodes*. Current valid combination: *Aleiodes texanus* Cresson.

vaughani Muesebeck.

Rogas vaughani Muesebeck, 1960 Ent. News 71:257. Type locality: Nicaragua, Managua Holotype deposited USNM (#65047).
Rhogas nigriceps Enderlein, 1920:155.
Rogas enderleini Shenefelt, 1975:1227.
Aleiodes vaughani, Shaw et al. 1997:33.

Distribution.—MÉXICO (Shaw et al. 1997); no specific localities published to date, but we have one Mexican specimen from the following locality: MÉXICO. *VERACRUZ:* Estación de Biología Tropical Los Tuxtlas.
Remarks.—Shenefelt (1975) renamed *nigriceps* Enderlein. The replacement name was unnecessary because he transferred *nigriceps* Wesmael back to *Aleiodes* while retaining *nigriceps* Enderlein in *Rogas*. Both nominal species are now in

Aleiodes, but following the synonymy of *vaughani* with *nigriceps* (Shaw et al. 1997), an older name is now available. Current valid combination: *Aleiodes vaughani* (Muesebeck).

vestitor Say.

Bracon vestitor Say, 1832 Boston J. Nat. Hist. 1:254. Type locality: "Mexico." Type: lost.

Rogas vestitor, Muesebeck 1925:82.

Distribution.—MÉXICO (Say 1832); no specific localities published to date.

Remarks.—The generic assignment of this species is questionable, since the type has been lost for about 150 years and the description is vague. Current valid combination: *Rogas vestitor* (Say).

Aleiodes cameronii (Dalla Torre)

Redescription.—Total length: female, 6.5–9.2 mm; male, 5.5–7.0 mm; specimens from Yucatan at large end of spectrum. *Head:* Antennae with 63–69 segments, with no apparent sexual dimorphism in length or number of flagellomeres; second antennal segment square, as long as wide; apical flagellomere with prominent spine; first flagellomere short, 0.62–0.67 × outer (shortest) length of scape; ocellar field very large, width of head at temples 2.48–2.73 × width of ocellar field, ocelli nearly touching eye, ocello-ocular line 0.08–0.13 × length of lateral ocellus, eye very large, with deep emargination, in dorsal view width of head at eyes 1.14–1.21 × width at temples; vertex finely granular, with oblique striae near ocelli; frons smooth; face occasionally with a weakly protruding, median triangle extending from clypeus to just dorsad middle of face, where it narrows to the median ridge that extends between bases of antennae (the interantennal carina), face transversely to obliquely strigose laterally, weakly to distinctly longitudinally strigose within triangle (or in an equivalent region of the face when an elevated triangular area is not apparent); malar space short, closely strigose, 0.10–0.13 × eye height, 0.56–0.66 × basal width of mandible, malar suture absent; clypeus irregularly rugulose-punctate, 2.18–2.37 × wider than high (slightly but distinctly taller in specimens from Yucatan: 2.00 × wider than high), not protruding; cyclostome opening 1.22 × wider than high; occipital carina usually complete above, though often weak and occasionally (10%) absent mid-dorsally, well-developed laterally, becoming indistinct ventrally, where it either terminates just short of hypostomal carina, or gives off weak, irregular striae, which sometimes (< 10%) reach hypostomal carina distinctly removed from base of mandible, occipital carina thus does not extend to hypostomal carina as a well-developed ridge; mandible short, length along dorsal surface about 0.80 × width at base; gena not protruding in frontal view; maxillary palp 2.2 × longer than labial palp, third and sixth maxillary palpomeres subequal in length, fourth slightly longer, third maxillary palpomere broadest, gradually widening from base to apex, second labial palpomere not obviously dilated, but distinctly broader than the slender third and fourth palpomeres. *Wings:* Fore wing: 2.2–2.48 × longer than mesosoma; venation as follow: M+CU sinuate, 1.83–1.91 × longer than 1M+1RS; 1M evenly curved; 1RS 0.42–57 × length of parastigma; (RS+M)a straight; (RS+M)b tubular, depigmented, short, 0.44–0.67 × length of 2RS; 2RS tubular, weakly to sharply bent at posterior fourth, 0.62–0.78 × length of 3RSa; 3RSa 1.58–1.92 × longer than r (r quite variable in length, even within populations); r-m straight to weakly bowed, tubular, depigmented; 2M straight, 1.23–1.37 × longer than 3RSa; m-cu slightly curved; 1cu-a distad 1M by 0.32–0.60 × length of 1cu-a; 1CUa 0.12–0.22 × length of 1CUb; 2CUa short, 0.54–0.72 × length of m-cu; 3-1A present. Hind wing: Vein M+CU straight, 0.93–1.0 × length of 1M; 1M slightly arched; m-cu nearly always (96%) present, short to very short, never extending more than half way to wing margin, postfurcal to r-m; 2-1A present; RS and 2M complete but not tubular, RS diverging from anterior margin of wing at its basal 0.3, distal 0.7 of marginal cell thus distinctly widening. *Mesosoma:* Pronotum mid-dorsally twice as long as shortest distance between occipital carina and lateral ocellus; dorsally with thin, low carina along anterior margin, this bordered posteriorly by shallow, narrow, crenulate groove, dorsal surface otherwise slightly uneven; pronotum shagreened to weakly granular dorsally and antero-dorsally in lateral view, laterally with striae radiating dorsally, posteriorly, and ventrally from small, polished, smooth to weakly sculptured spot; angle between pronotum and anterior declivity of mesoscutum slightly more than 135°. Notaulus very weakly

impressed anteriorly, sometimes barely discernible ending in weak, broad, median depression posteriorly; mesoscutum granular/shagreened, except median depression rugose to weakly rugulose; scutellar sulcus irregularly strigose, often without clearly defined central carina, short, 0.36–0.43 × median length of scutellum; scutellum nearly smooth, polished medially, with only a trace of shagreened sculpture, weakly strigose-punctate laterally; posterior margin of mesonotum forming an unsculptured, polished band. Median longitudinal carina of propodeum distinctly elevated and visible in lateral view only on anterior 0.25, otherwise variable: complete in nearly all specimens examined from U.S., but weak to absent over posterior half in most specimens from Yucatan and Oaxaca; propodeum varying from uniformly granular or nearly so (rugulose only along midline posteriorly) to granular anterolaterally grading to densely but finely granular-rugose medially and posteriorly. Mesopleuron with small smooth, polished area medially extending to posterior margin above speculum then dorsally along posterior margin to wing base, otherwise striate to strigose dorsally, sometimes very strongly so and punctate to weakly striate over ventral half; precoxal sulcus absent. Metapleuron weakly punctate medially, rugose dorsally and along ventral margin. Inner spur of hind tibia short, 0.48–0.52 × length of basitarsus. Posterior tarsal claw pectinate throughout, teeth large, those in middle nearly as tall as apical claw. *Metasoma:* First tergite with basal triangle well developed, extending onto dorsal surface from anterior declivity. T1, T2, and basal 0.75–0.95 of T3 aciculate, remaining terga largely smooth and without median carina; median carina usually extending from basal triangle of T1 to middle of T3, gradually merging with surrounding sculpture over apical half of T3, carina usually well developed throughout, rarely (15%) absent on T3 and/or weakly developed posteriorly on T2, equally rarely with carina complete to posterior end of T3. Lateral lobe of dorsope distinctively expanded, carinate, but short, shorter than distance from end of carina to spiracle. Lateral margin of T3 sharp, lateral margin of T4–T6 rounded. Median triangle at base of T2 small, largely hidden by well-developed median distal lobe of T1. T2/T3 suture crenulate, distinctly impressed. Males with distinct pits medially on T4–6 (never present on T7 in our material, though T7 and sometimes T8 more densely setose medially); pit on T4 absent in one-third of specimens, when present, always smaller than pits on T5 and T6, T4 pit oval to heart-shaped, divided at extreme base and extending internally at antero-lateral corners; T5 and T6 with larger but variably sized pits, width of pit on T5 0.09–0.29 × width of tergum; all pits densely setose. T1 1.27–1.40 × longer than T2, T2 1.24–1.38 × longer than T3, T2 + T3 1.27–1.40 × longer than T1. Females with hypopygium truncate; ovipositor about 1.2 × longer than hypopygium, straight, with well-developed node subapically, strongly narrowed medially, and strongly dilated basally, setae on ovipositor sheath longer, denser on dorsal half, equal in length to depth of sheath. *Color:* Orange to pale yellow; flagellum and stemmaticum black; scape, pedicel, and dorsal side of telotarsus dark brown; wings hyaline, stigma yellow; ovipositor sheath brown apically, yellow basally.

Biology.—Unknown.

Material examined.—MÉXICO. *OAXACA:* 17 km N of Miltepec, 11 July 1973, Mastro & Schaffner, 1 female. *YUCATAN:* Reserva Especial de la Biosfera de Ría Lagartos, El Cuyo, 4–5 May 1994, H. Delfín, 3 females, 5 males; 11 km N of Mérida, 27 May 1996, R. Wharton, 1 male; Xmatkuil, 18–28 June 1996, H. Delfín & F. León, 1 male. USA. ARIZONA. *MARICOPA Co.*: 12 km NE Apache Jct., 17 July 1998, J. Oswald, 1 female. *PIMA Co.*: 17 km NW Arivaca, 18 July 1998, J. Oswald, 2 males. NEW MEXICO. *LEA Co.*: 32°24.8′N, 103°41.5′W, 1 August 1979, J. Delorme & C. McHugh, 1 female. TEXAS. *BRAZOS Co.*: Bryan, 25 May 1974, J. Schaffner, 1 male; College Station, 12–18 April 1978, J. Jackman, 1 female. *BREWSTER Co.*: Big Bend National Park, N Rosillos Mts, Buttrill Springs, 22 March–8 April 1991, Wharton & Whitefield, 3 females, 3 males; same except 10 March 1991 and 23–25 April 1991, Wharton, Woolley & Zolnerowich, 2 females, 1 male. *LASALLE Co.*: Chaparral Wdlf Mgmt Area, 29–30 September 1989, J. Schaffner, 1 female. *RANDALL Co.*: Palo Duro Cyn, 14 June 1960, R. Fischer, 1 female. *VAL VERDE Co.*: 9 April 1960, 1 female.

Discussion.—Shaw et al. (1997) included *cameronii* in the *pulchripes* species group, and gave a detailed diagnosis. Our material from Yucatan differs from this diagnosis in certain details (notably development of propodeal carina and placement of pits on the male terga), and we initially concluded that this was an undescribed species. Subsequent examination of numerous specimens of *cameronii*, many of them determined by Shaw, has enabled us to characterize this species more completely, and revise our initial assessment. For most characters,

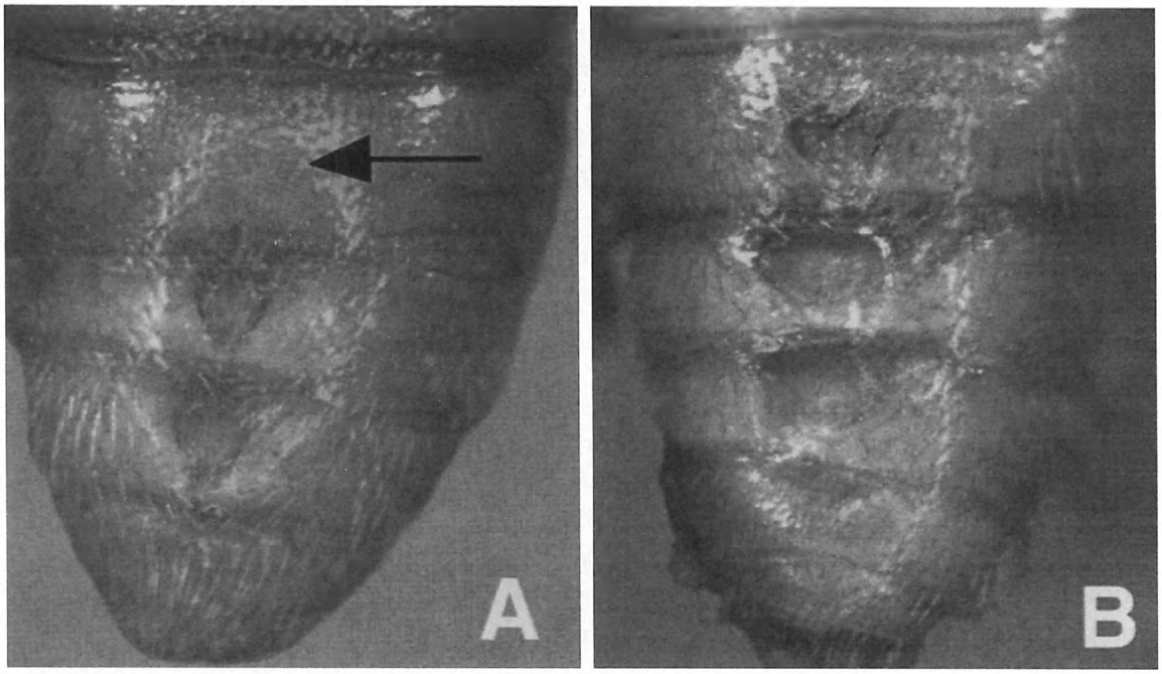

Figure 1. Dorsal abdominal pits of *Aleiodes cameronii* from the same Pima Co., Arizona locality, showing differences in size and placement of pits on terga 4–6. A. Pits on terga 5 and 6 only. Arrow = terga 4 without pit. B. Pits on terga 4–6.

specimens from southern Mexico do not differ significantly from those collected in the U.S., and variation within popuations is equivalent to that among populations from widely scattered localities. For example, pit size and placement on male terga is variable, and the largest pits in our material occur on one specimen from Yucatan and one from Arizona. In each case, other males from the same locality have distinctly smaller pits (roughly half the size, as in Fig. 1). Shaw et al. (1997) stated that males of *cameronii* have large dorsal median circular pits on metasomal terga 5–7, but all of our specimens have the pits on terga 4–6 (Fig. 1B) or only terga 5 and 6 (Fig. 1A). We found few regional differences: specimens from southern Mexico tend to have a weaker median carina on the propodeum, and those from Yucatan have a slightly taller clypeus and are pale yellow. Our material matches Cameron's (1887) original description (including placement of pits) with one exception. Cameron (1887) noted far fewer antennal segments in his original description, but the number he gives (47) must have represented an antenna that was broken.

Shaw et al. (1997) included 17 species in the *pulchripes* group, and although they stated that the group is restricted to the New World, they undoubtedly meant only those species with dorsal abdominal pits. Five of the species included in the *pulchripes* group by Shaw et al. (1997) are known only from the Palaearctic. Six of the 12 previously known New World species have males with setose pits (similar to those of *cameronii*) on terga 4–6, 4–7 or 5–7. While the presence of these pits is a potential synapomorphy uniting these species within the *pulchripes* species group, the distribution of this character state is not congruent with other characters that could be used to subdivide this species group, such as the arrangement of teeth on the claws.

Aleiodes cameronii differs from all other members of the *pulchripes* species

group by the placement of fore wing cross-vein 1cu-a, which arises near 1 M (an unusual feature in *Aleiodes*). The curvature of hind wing RS is also distinctive. The combination of tergal pits, closely spaced pattern of the enlarged teeth on the tarsal claws, and uniformly colored body and flagellum further separates *cameronii* from all but *A. rossi* Marsh and Shaw. In addition to the placement of fore wing 1cu-a, *rossi* differs in lacking hind wing m-cu and by having a shorter hind wing r-m and more rugose propodeum. Both *rossi* and *A. earinos* Shaw have large dorsal pits equivalent to those of *cameronii*. Although the venation in *earinos* is more similar to that of *cameronii* than is *rossi*'s, the tarsal claws of *earinos* are incompletely pectinate.

Dorsal abdominal pits have a restricted distribution within *Aleiodes*, occurring in 14 described species. They are presently known only for males from the *pulchripes* and *dispar* species groups, but not all species within these groups have males with abdominal pits (van Achterberg 1985, van Achterberg & Penteado-Dias 1995, Shaw et al. 1997). These two species groups are readily separated from each other, with major differences in the size of the pronotum, curvature of the propodeum, size of eye and ocelli, relative length of the hind trochantellus, and development of the precoxal sulcus (sternaulus) (van Achterberg & Penteado-Dias 1995, Shaw et al. 1997). The pits themselves also differ slightly, being confined to terga 2 and 3 in the *dispar* group and terga 4–7 in the *pulchripes* group. Though work on the relationships among the species of *Aleiodes* is still on-going (e.g., Fortier 1997), it seems unlikely that these two groups are sister taxa. Specific features associated with the occipital carina, head shape, and body sculpture suggest that members of the *pulchripes* group are more closely related to species within other groups than to the species within the *dispar* group.

Though species with abdominal pits from the *pulchripes* group are apparently confined to the New World, those from the *dispar* group are more widespread (previously recorded from the Palaearctic, Neotropical, and Oriental Regions). With the exception of *A. excavatus* (Telenga), however, males of the *dispar* group with abdominal pits are rare in collections (van Achterberg & Penteado-Dias, 1995), and the disjunct distribution pattern of this group is likely an artefact. Specimens in the TAMU collection indicate a more nearly cosmopolitan distribution for these species, with representatives from Namibia and three localities in Australia (two in Queensland and one in South Australia): the first records for these two continents. The African and Australian individuals are typical members of the *dispar* group, as defined by van Achterberg and Penteado-Dias (1995). As there are only four specimens representing three species, and no accompanying females, they are not described here.

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