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A Revision of the *Tetrasphaeropyx* Ashmead Lineage of the Genus *Aleiodes* Wesmael (Hymenoptera: Braconidae: Rogadinae)

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Abstract

In this revision, seventy-two *Aleiodes* (*Tetrasphaeropyx*) species are described of which 28 are recently described species and 43 are new species. A morphological phylogenetic analysis provided to test the monophyly of the group using *Aleiodes coxalis*-group species as the out-group provides evidence for the monophyly of the *A.* (*Tetrasphaeropyx*) group, which is herein classified as a subgenus of *Aleiodes* Wesmael. *A. coxalis*-group species were used as the outgroup because previous work has shown that the *A.* (*Tetrasphaeropyx*) lineage falls at the apex of the *A. coxalis*-group. A dichotomous key to all species is provided as well as a glossary of terminology, illustrations referred to in the key, host information, and geographical collection information. *Aleiodes* (*Tetrasphaeropyx*) is easily distinguished from other *Aleiodes* species by the sculptured, carapace-like metasomal tergite IV. Host associations herein reported for about 35% of all *A.* (*Tetrasphaeropyx*) species suggest that the group exclusively attacks larvae of Geometridae. *Aleiodes* (*Tetrasphaeropyx*) species treated in this study are as follows: *A. accohannocki* n. sp., *A. alafuscus* n. sp., *A. anatariatus* Fortier, *A. aquaedulcensis* Fortier, *A. aranamai* n. sp., *A. arcticus* (Thomson), *A. areolatus* Fortier, *A. argyllacearivorax* Fortier, *A. arikarai* n. sp., *A. assateaguenus* n. sp., *A. axaceei* n. sp., *A. bretti* n. sp., *A. brevicellula* Fortier, *A. cartwrightensis* Fortier, *A. catherinensis* Fortier, *A. chisosi* n. sp., *A. chumashanus* n. sp., *A. citriscutum* Fortier, *A. cochisensis* Fortier, *A. copiosus* n. sp., *A. crassijugosus* Fortier, *A. dabai* n. sp., *A. dakotensis* Fortier, *A. dissiticarina* Fortier, *A. dorsofoveolatus* Fortier, *A. exiguus* n. sp., *A. fernaldellavorax* Fortier, *A. flavinotaulus* Fortier, *A. haematoxyloni* Fortier, *A. halifaxensis* Fortier, *A. hiisiis* n. sp., *A. huberi* Fortier, *A. illiniweki* n. sp., *A. iowensis* n. sp., *A. itamevorus* Shaw and Marsh, *A. jaliscoensis* Fortier, *A. karankawai* n. sp., *A. kisomm* n. sp., *A. kohook* n. sp., *A. luhmani*

n. sp., *A. magnoculus* n. sp., *A. maheono* n. sp., *A. maidunus* n. sp., *A. mannegishii* n. sp., *A. marinensis* n. sp., *A. maritimus* Shaw and Marsh, *A. min* n. sp., *A. nigrilatus* n. sp., *A. oaxacensis* Fortier, *A. parabretti* n. sp., *A. paracopiosus* n. sp., *A. paraluhmani* n. sp., *A. parareolatus* n. sp., *A. paraselu* n. sp., *A. parasquilaxensis* n. sp., *A. pilosus* (Cresson), *A. pooedooa* n. sp., *A. provancheri* Fortier, *A. pseudoanatariatus* n. sp., *A. quickei* Fortier, *A. quiniguanus* n. sp., *A. reisi* Fortier and Sherman, *A. sarceei* n. sp., *A. secwepemc* Fortier, *A. selu* n. sp., *A. sexmaculativorax* Fortier, *A. shawi* Fortier, *A. squilaxensis* n. sp., *A. totuyai* n. sp., *A. tulensis* Fortier, *A. tullyi* Fortier, and *A. wicayazipa* Fortier.

Key words: *Aleiodes*, Rogadinae, Braconidae, Geometridae, parasitoid, *Tetrasphaeropyx*, *Aleiodes pilosus*, phylogenetic, morphological, koinobioint, endoparasitoid, carapace

Introduction

With about 12,000 described species and an estimated actual species richness of about 50,000 (Whitfield *et al.* 2004), the Braconidae, a family of wasps most of which are larval parasitoids of other holometabolous insects (Quicke 1997, Shaw and Huddleston 1991), is the second largest family within Hymenoptera (Wharton 1997, Wharton and van Achterberg 2000). The family consists of two informal groups, the cyclostomes and non-cyclostomes. The cyclostomes, into which the subfamily Rogadinae falls, are characterized by the lower part of the clypeus sharply recessed, exposing the concave labrum (Shaw and Huddleston 1991; Shaw 1997; Wharton 1997; Zaldivar-Riveron *et al*. 2006). Among cyclostome braconids, koinobiont endoparasitism is thought to have evolved independently four times: in the (1) Alysiinae + Opiinae, (2) Braconinae (*Aspidobraconina*), (3) Aphidiinae, and (4) Rogadinae respectively (Zaldivar-Riveron *et al*. 2006). "Koinobiont" refers to a host relationship strategy in which the host is not permanently paralyzed or killed at the time of oviposition, but continues to feed and grow for a time after which it is killed by the parasite.

The genus *Aleiodes* Wesmael is a large group of parasitic wasps in the subfamily Rogadinae, comprising about 225 described species worldwide (Delfin-Gonzalez and Wharton, 2002). Although they are found on every continent except Antarctica, they are particularly species-rich in the New World (Shaw *et al*. 1997, Shaw 1997, Delfin-Gonzalez and Wharton 2002). In the United States and Canada at least 90 species are known and new species, such as those described here, are still being discovered (Shaw 1997). As in other members of the subfamily Rogadinae *s.s.*, *Aleiodes* are koinobiont endoparasitoids of lepidopteran larvae that mummify the host larva when it dies, pupating inside the mummy (Shaw 1997). Before pupating, the *Aleiodes* larva usually cuts a hole in the ventral thoracic region of the host mummy through which the mummy is glued to a substrate (leaf, twig, etc.). Upon emergence, the adult *Aleiodes* cuts a smooth, round hole in the dorso-posterior area of the mummy through which to exit (Fig. 1C, arrow) (Shaw 1997).

Numerous *Aleiodes* species-groups have been defined as monophyletic (Fortier and Shaw 1999, Shaw 1997, Shaw *et al*. 1997, Shaw *et al*. 1998a, Shaw *et al*. 1998b, Shaw *et al*. 2006). There is a tendency for basal species groups collectively to attack more than one host family, predominantly within Geometroidea, and for derived species-groups exclusively to attack Noctuidae (Fortier and Shaw 1999). The *A. coxalis* (Spinola) species-group is a large monophyletic group distinguished by the rugose vertex and sculptured fourth metasomal tergite in many species (Fortier and Shaw 1999). There is very little host information except for some records that indicate parasitism of larvae of Noctuidae, Arctiidae, and to a lesser degree Lycaenidae (Shaw *et al*. 2006).

Past evidence suggests that *Aleiodes* (*Tetrasphaeropyx*) is derived from within this lineage (Fortier & Shaw 1999, Shaw *et al*. 2006), and has been defined by the carapace-like and entirely sculptured metasomal tergite IV that covers all tergites posterior to it (Plate 1 Figs. A, B; Plate 28 Figs. 152, 153). Interestingly and uncharacteristically for a basal lineage of *Aleiodes*, all host records of species of *Aleiodes* (*Tetrasphaeropyx*) examined to date are exclusively Geometridae (Fortier and Shaw 1999; Fortier 2006a, b; Fortier 2007a, b, Fortier 2008). *Aleiodes* (*Tetrasphaeropyx*) species were previously known only from western North America (Shaw 1997) until recently (Fortier 2006b; Fortier 2007a, b). *Aleiodes* (*Tetrasphaeropyx*) specimens are infrequently collected (Shaw 1997), and their host associations remained unknown until recently.

Cresson (1872) and Fortier (2006b, 2007a, b) have described species within this species-group. The putative sister-group is hypothesized to be composed of a species-cluster consisting of *A. itamevorus* Shaw and Marsh (2004) and *A. maritimus* Shaw and Marsh (2004), based on Fortier and Shaw (1999). In the latter study, *Aleiodes arcticus* Thomson (1891), a northwestern Palaearctic species, came out as sister to these latter 2 species. *A. maritimus* and *A. itamevorus* together occur in Canada and Wisconsin USA from the Maritime Provinces westward as far as the Yukon Territory (Shaw and Marsh 2004). All 3 of these species are only associated with geometrid host records (Shaw and March 2004, personal observation).

The purpose of this paper is to provide a comprehensive revision of the *A.* (*Tetrasphaeropyx*) lineage with descriptions and an identification key for all known *A.* (*Tetrasphaeropyx*) species as well as to test the hypothesis that the group is monophyletic with a comprehensive morphological phylogenetic analysis.

Materials and methods

Species cited in this paper can be identified as belonging to the subfamily Rogadinae by using the keys of Shaw (1995), van Achterberg (1991), or Wharton *et al*. 1997. My definition of *Aleiodes* follows that of Fortier and Shaw (1999), Shaw (1995), Shaw *et al*. (1997) and van Achterberg (1991). Specimens can be determined as *Aleiodes* by using the keys of van Achterberg (1991) or Wharton *et al*. (1997).

Specimens were borrowed from the following museums: The American Entomological Institute (AEI), Gainesville FL USA, the Academy of Natural Sciences at Philadelphia (ANSP), Philadelphia, PA USA; the Canadian National Collection (CNC), Ottawa, ON, CANADA; the Cornell University Insect Collection (CU), Ithaca, NY USA; the Insect Research Collection at the University of Wisconsin (IRCW), Madison, WI USA; the Albert J. Cook Arthropod Research Collection at Michigan State University (MSUEL), East Lansing, MI USA; the Smithsonian National Museum of Natural History (NMNH), Washington D.C. USA; the National Museum of Scotland (NMS), Edinburgh, Scotland; the Rocky Mountain Systemic Entomology Laboratory at the University of Wyoming (ESUW), Laramie, WY USA; the Snow Entomological Museum at the University of Kansas (SNOW), Lawrence, KS USA; the Texas A&M University Entomology Collection (TAMU), College Station, TX USA; the Institute of Arctic Biology at the University of Alaska (UAF), Fairbanks, AK USA; the Essig Museum of Entomology at the University of California (UCB), Berkeley, CA USA; and the Bohart Museum of Entomology at the University of California (UCD), Davis, CA USA; the University of Minnesota Insect Collection (UMSP), St. Paul, MN USA; and the University of California Entomology Research Collection (UCR), Riverside, CA USA. Observations and measurements were made with a Leica MZ 12.5 stereomicroscope. An ocular micrometer in the eyepiece of the microscope was used for measurements. Images were made with a Syncroscopy Automontage photo-imaging system. Morphological terms follow Sharkey and Wharton (1997). Sclerite surface sculpturing terminology follows Harris (1979) and other morphological terminology including wing venation follows Sharkey and Wharton (1997).

A phylogenetic analysis was conducted using a MacClade 4.08 (Maddison and Maddison 2005) matrix file with 83 morphological characters and 75 taxa (Tables 1, 2). Characters fell into the following categories: (a) coloration (2), (b) morphometric (11), and (c) qualitative sculpturing features (70). The matrix file was opened in PAUP 4.0b10 (Swofford 2000) on a Mac G5 OX10 computer. All characters were treated as having equal weight, and were left unordered. The analysis was polarized using using *A. coxalis*-group species *A.wyomingensis* and *A. quadratus* as the outgroup. A heuristic search for the most parsimonious tree was made. Branch support for the strict consensus tree was evaluated by Bootstrap and Bremer evaluation methods. A Bootstrap analysis for that tree was performed with 10,000 replications and a heuristic search. The Bremer analysis was performed using Tree Rot.v2c (Sorenson 1999), saving three trees per random addition replication with 500 replications (Sorensen personal communication).

TABLE 1. Summary of characters and character states. Integers designating characters appear as column headers in the matrix (Table 2), while integers in brackets, designating component character states for each character, appear at the intersection of the row for a given species and column for a given character.

1. **Scutum pattern** [0] northern; [1] not northern
2. **Forewing length** [0] less than or -equal to 3.8 mm; [1] greater than 3.8 mm, less than 4.5 mm; [2] greater than 4.5 mm.
3. **Malar space/mandibular base** [0] greater than 1.4; [1] less than 1.4
4. **Temple/eye width** [0] greater than 0.7; [1] less than 0.7.
5. **Occipital carina complete medially** [0] no; [1] yes
6. **Ocell-ocular distance/longest diameter of lateral ocellus** [0] ocelli large, ocell-ocular diameter (ood)/longest diameter of lateral ocellus (dlo) less than 0.8; [1] medium; ood/dlo 0.8-1.1; [2] ocelli small, ood/dlo greater than or equal to 1.1.
7. **Temple sculpturing** [0] coriaceous only; [1] rugulose; [2] punctate or foveate
8. **Pronotum: ventro-lateral sculpturing rugulose or costate** [0] no; [1] yes
9. **Pronotum: ventro-lateral sculpturing coriaceous** [0] yes; [1] no
10. **Pronotum**: **ventro-lateral sculpturing foveate** [0] no; [1] yes.
11. **Pronotum: dorso-lateral sculpturing foveate** [0] no; [1] yes.
12. **Pronotum: dorso-lateral sculpturing rugocostate &/or coriaceous** [0] no; [1] yes
13. **Pronotum: dorso-lateral sculpturing smooth-costate &/or nitid** [0] no; [1] yes
14. **Scutum sculpturing coriaceous** [0] yes; [1] no
15. **Median posterior area of scutum thickly rugose/rugocostate** [0] no; [1] yes
16. **Scutellar disc microsculpturing** [0] heavily coriaceous; [1] faintly coriaceous; [2] not coriaceous
17. **Propodeum sculpturing deeply rugulose** [0] no; [1] yes
18. **Propodeum sculpturing deeply rugose** [0] no; [1] yes
19. **Propodeum sculpturing foveate** [0] no; [1] yes
20. **Inner spurs of hind tibia/length of hind basitarsus** [0] less than 0.3; [1] greater than or equal to 0.3 and less than 0.4; [2] greater than or equal to 0.4.
21. **Hind coxa dorsum rugulose** [0] strongly rugulose; [1] weakly rugulose; [2] not rugulose.
22. **Hind coxa dorsum tightly, densely rugulose** [0] no; [1] yes
23. **Hind coxa dorsum foveate** [0] no; [1] yes
24. **Forewing r/3RSa** [0] less than 0.8; [1] greater than or equal to 0.8, less than or equal to 1; [2] greater than 1.
25. **Forewing r/m-cu** [0] less than or equal to 1; [1] greater than 1.
26. **Forewing 1CUa/1CUb** [0] greater than or equal to 0.5; [1] less than 0.5.
27. **Forewing 1CUa/1Cub** [0] less than 0.25; [1] greater than or equal to 0.25 and less than 0.4; [2] greater than or equal to 0.4.
28. **Tergite IV with rugulation or foveolation** [0] no; [1] yes
29. **Tergite IV sculpturing lightly rugulose-coriaceous** [0] no; [1] yes
30. **Tergite IV sculpturing areolate rugulose** [0] no; [2] yes
31. **Tergite IV sculpturing foveolate** [0] no; [1] yes
32. **Tergite IV flange shape** [0] absent; [1] present, ventral margin not entirely recurved; [2] present, ventral margin entirely recurved.
33. **Second submarginal cell of forewing** [0] trapezoidal or rectangular, 2RS/2M less than 0.71; [1] short, 2RS/2M greater than 0.71.
34. **Tergite I apical width/tergite length** [0] less than 1.4; [1] greater than 1.4; less than 1.8 [1] greater than or equal to 1.8.
35. **Tergite IV curved antero-dorsally** [0] no; [1] yes
36. **Tergite IV internal angle of curvature** [0] greater than 90º, carapace shallow; [2] about 90º, carapace medium; [3] less than 90º, carapace deep
37. **Tergite IV flange color**: [0] not abruptly white or much paler than rest of tergite; [1] abruptly white or much paler than rest of tergite.

38. **Scutum sculpturing punctate or foveate**: [0] no; [1] yes
39. **Posterior half of propodeum steeply declivous** [0] no; [1] yes.
40. **Propodeum medial carina** [0] complete; [1] incomplete
41. **Scutellar disc rugulose or foveolate** [0] neither; [1] rugulose; [2] foveolate.
42. **Tergite II costae thickened** [0] yes; [1] no.
43. **Tergite II finely rugulose reticulate** [0] yes; [1] no.
44. **Tergite II foveolate** [0] yes; [1] no.
45. **Tergite III finely rugulose** [0] yes; [1] no.
46. **Tergite III finely rugulocostate** [0] yes; [1] no
47. **Tergite III rugocostate or costate, neither rugulocostulate nor heavily rugocostate** [0] yes; [1] no
48. **Tergite III heavily rugocostate or costate** [0] yes; [1] no
49. **Tergite III sculpturing areolate or smoothly rugulose-areolate** [0] no; [1] yes
50. **Tergite III sculpturing foveolate or punctate** [0] yes; [1] no
51. **Precoxal sulcus shape large, well-defined** [0] yes; [1] no
52. **Precoxal sulcus shape shallow, broadly defined or small, sharply defined** [0] neither; [1] shallow, broadly defined; [2] small, sharply defined.
53. **Precoxal sulcus microsculpturing coriaceous** [0] yes; [1] no
54. **Precoxal sulcus with carinulation** [0] no; [1] yes, weakly impressed carinulation; [1] yes, strongly impressed carinulation
55. **Mesopleuron coriaceous** [0] yes; [1] no
56. **Mesopleuron macrosculpturing rugose or rugose-areolate** [0] no; [1] yes.
57. **Mesopleuron macrosculpturing: shallowly or sparsely punctate** [0] no; [1] yes.
58. **Mesopleuron macrosculpturing: heavily foveolate** [0] no; [1] yes.
59. **Subalar knob minute areolation** [0] present; [1] absent.
60. **Subalar knob macrosculpturing** [0] none; [1] carinate; [2] foveolate.
61. **Sculpturing of area below subalar sulcus** [0] coriaceous; [1] costate; [2] foveolate.
62. **Sculpturing of area posterior to precoxal sulcus** [0] coriaceous; [1] not coriaceous
63. **Vertex coriaceous**[0] yes; [1] no
64. **Vertex sculpturing: strongly, coarsely rugocostate** [0] no; [1] yes.
65. **Vertex sculpturing: strigulate or finely costulate or rugulocostulate** [0] no; [1] yes.
66. **Vertex sculpturing: punctate** [0] no; [1] yes.
67. **Tergite I sculpturing: strongly, coarsely rugocostate** [0] no; [1] yes.
68. **Tergite I sculpturing: foveate** [0] no; [1] yes.
69. **Tergite I sculpturing: heavily, smoothly rugose, rugocostate, or costate** [0] no; [1] yes.
70. **Tergite I sculpturing: finely rugocostate** [0] no; [1] yes.
71. **Tergite I sculpturing: coarsely, tightly rugulose;** [0] no; [1] yes.
72. **Tergite II sculpturing: rugocostate** [0] no; [1] yes.
73. **Tergite II sculpturing: areolate** [0] no; [1] yes
74. **Tergite II sculpturing: heavily, finely ruglose** [0] no; [1] yes
75. **Tergite I sculpturing: areolate** [0] no; [1] yes
76. **Pronotum shelf-like** [0] no; [1] yes.
77. **Tergite I sculpturing: rugocostate, not coarse, not thick** [0] no; [1] yes.
78. **Tergite IV covering apical tergites** [0] not 2 or more; [1] not tip of 1 or covering them all
79. **Forewing length r/3RSa [**0] less than 0.5; [1] greater than 0.5.
80. **Tergite I apical width greater than length** [0] no; [1] yes.
81. **Number of flagellomeres greater than 45** [0] no; [1] yes.
82. **Genal sculpturing rugose or costate** [0] no; [1] yes.
83. **Metasomal tergites I-III with thin costae** [0] yes; [1] no

TABLE 2: Matrix. Row are species, columns are characters, and integers in cells are character states. Outgroup = *A. wyomingensis* + *A. quadratus*.

	1 .	10 .	20 .	30 .	40 .	50 .	60 .	70 .	80 .
wyomingensis	02001211100100000101000000200000000000010111111101101201000010110000000000010001010								
quadratus	02001210000100000102000111000000111000000011111001000200000011110000000000001011110								
arcticus	00001200000100001001200101110100101000000101011101100000000000000000000010000001100 1								
itamevorus	11001201000100001001010001111100001000001111011101100000000100001000001101000011001								
maritimus	11101100000100001001210001111100001000000111011101100000000100000000001000000011001								
accohannocki	00110200100100001001200011111101001000000111011011000000001000000000100000001110 01								
alafuscus	00100100000100001001200001111102011200001011111001100100000100000000100000010111001								
anatariatus	11001211100100010101000011011101001000001111110101100000001110110010000000010111001								
aquaedulcensis	00001211111000020011201111112012001211002110111100121210011221110001000100010111001								
aranamai	00110001000100001001110011011101001000000111101101100100001100001000010000000111001								
kohook	00110111000010000100200011011101001000001111101101100100000110010000000100011111001								
areolatus	00001201101000010101201101111012101111002111111110121210011110010000000110110111001								
argyllacearivorax	00000201100100001001200001111101001000000111101101100001000010000000010000000111001								
arikarai	00001201100100000101100001111102001100001011111001110000000110001000100100000111001								

TABLE 2: Matrix.

	1 10 20 30 40 50 60 70 80
	. . . .
assateaguenus	000001011000100101012010010111010010010011111101111101001011100100001000000000111001
axaceei	001101011001000110021100011111020011000011111011011001010001101010000100000000111001
brevicellula	000012211110000100112012111120121112111021101111001212100112211010010001000101110001
cartwrightensis	010012100001000010010100011111010010000011111011011011010011111001000001101000111001
catherinensis	010012111000101201012011112120120112111020111111111212100111201100001001000101110001
chisosi	001100111001000010010100011111020011000011111011011001010001100010000100000101110001
chumashanus	000012011001000110011000011111010010000011111101011001001001100010000000000111111001
citriscutum	000012111010000100112011011120120012010021101111001212100111201100010001000101110001
cochisensis	000012211110010200112012111120121112111021101111001212100112211010010001000101110001
copiosus	011100011001000010012000010111020011000011010111011101000011101010000101000101110001
crassijugosus	010012111000100001011000011111010010000010111110011001000011101100001001000000111001
dabai	000012111001000101011011111111020012010121111111111202001011101010000001101111110001
dakotensis	010012011000101001021000010111020012001010111110011201011011101100001001000101110001
dissiticarina	001101000001000001011001011111010010000001110111011001000001000000000000000001111001

TABLE 2: Matrix.

	1 .	10 .	20 .	30 .	40 .	50 .	60 .	70 .	80 .
dorsofoveolatus	000012111010000201012011011201200121101211111110012121101122011000100011011011 1001								
exiguus	000100010001000210012000010111010010000011010111011000000001100010000100000001 11001								
fernaldellavorax	000012211110010200122011011201211120111211011110012121001122110010100010001011 1001								
flavinotaulus	010012211110000200112012111120121112111021101111001212100112211001010001000101 11001								
haematoxyloni	001100011001000010011100110111010010000011111011011001000011100010000100000101 11001								
halifaxensis	101101100001000001022000011111010010000001110111011000000001000010100000000001 11001								
hiisiis	000012011000100101012011011110210111010211111111112121100111100100000010011111 1001								
huberi	000002011010000101002011112120121112111021111101011212100111201100001001000101 11001								
illiniweki	000012011000101101011000111111020011001020111101011201001011100010001001000101 11001								
iowensis	000012011000101001012001011111021012000010111110011100001001100100001001000101 11001								
jaliscoensis	011100010001000001012000011111010010000011111101011000010001100100100000000101 11001								
karankawai	001100011001000110011000010111010011000011010111011101000001100010000101000111 11001								
kisomm	000012011001000101012011111111021012110021111111111212011011211000000001101101 11001								
wicayazipa	000002011000101201010001111111020112000010111110011101001001100000001001000101 11001								

TABLE 2: Matrix.

	1	10	20	30	40	50	60	70	80
	.	.	.	.	.	.	.	.	.
luhmani	0100020101000000100120000101110110100000011110110110010000000000000001010000011100								
paraluhmani	0100020101000000100120000101110110100000011110110110010000000000000001010000011100								
magnoculus	0011000110010001100120000101110100110000111101110111010000111100100000001000111100								
maheono	0000111100010000100110000111110200100000011111110110000000111001000000010001011100								
maidunus	0000110110010001010120100111110100100100211111010111110110111101000010000001011100								
mannegishii	0011000100010000100120000101110200110000111101110111010000011000000001000000011100								
marinensis	0000120100010000010000000111110100100000011110110110020100011100000001010001011100								
nigrilatus	0011101100010000100120000111110100100000111111010110000100011111000000000001111100								
oaxacensis	0000121111100001001220111111201211121110211011110012121001122110000100010001011100								
min	0000120100001011010110000111110200110000111111100111010010011011001000000001111100								
pooedooa	0010110110001000100010010101110110100000111111010110000100111101000010000000011100								
paracatherinensis	0100121110001012010100000101201201121110101111100112121100111111000010010001011100								
parareolatus	0000110110001000010120100111110200111100111111111112120010111100000010000011011100								
pilosus	0000122111100102001220121101201211121111211011110012121001122110010100010001011100								

TABLE 2: Matrix.

	1 .	10 .	20 .	30 .	40 .	50 .	60 .	70 .	80 .
provancheri	10001201100100000100100001111101001000001111101101100101001110110010000110000111001
pseudoanatariatus	01001110100100010101201101011101101101001111111101110000101111110000100100010111001
paracopiosus	00110001100100000101000001011102001100001111011101110100001110000000000010001111001
quickei	00110001100100001001010001011101001100001101011101110100001110000000000000001111001
quiniguanus	00110001000100001001110001111102001100001111011101110100001111000000010000010111001
sarceei	00110100000010001001100001111101001000000111011101100100000010000000000000001111001
secwepemc	11001211100100010101000001111101001000001111101101101101001111110010000101000111001
reisi	00110101000100000101100001111101001000001111011101100000000010000000000000001111001
selu	00001211101000010101201101112102111211102111111111121210011221110010000100010111001
paraselu	00001211101000010102201101112102011211102111111111121210011221110010000100010111001
sexmaculativorax	10110100000100000100200001111101001000000111011101100100000000000000000000001111001
shawi	00110101100100000100100001111101001100001111101101100100001111110000000000001111001
squilaxensis	01000201100010001001110101111101001000000111011101100100000110010000010100000111001
parasquilaxensis	00001201100010001001110001111101001000000111001101100100000110001000010100000111001

TABLE 2: Matrix.

	1	10	20	30	40	50	60	70	80
	.	.	.	.	.	.	.	.	.
totuyaius	0100110110010000010120100101110100110100211111100111010010111001000010000001011100								1
tulensis	0000021111100001001220110111201210121110211011110012121001122110100100010001011100								1
bretti	0011010010001101010100001111010100110000111101110110011010111111000000010000111100								1
parabretti	0011010110001001010100100111110100100000111110110010011010111111000000010000111100								1
tullyi	0000121110010000110201000111010101100000111101110110020100111011000000100000011100								1

Results

Phylogenetic analysis

The heuristic search for the most parsimonious solution yielded 3614 equally parsimonious trees, each tree with a length of 541 steps. The strict consensus of these trees (Plate 3) had a C.I. of 0.22 and R.I. of 0.71. Bootstrap and Bremer support are shown on the strict consensus tree.

The strict consensus indicates that *Aleiodes* (*Tetrasphaeropyx*) is a monophyletic group with respect to the out-group (bootstrap value = 94, Bremer support value = 7) and includes *A. arcticus* Thomson, *A. itamevorus* Shaw & Marsh, and *A. maritimus* Shaw & Marsh. The one species recorded only from Alaska falls at the base of this group (*A. tullyi* Fortier). Immediately apical to the former is a monophyletic cluster composed entirely of Canadian species. Apical of this cluster is a monophyletic group composed of two large monophyletic sister groups. Both of these groups are composed of predominantly northern species at their bases and of predominantly southern USA and Mexican species at their apices. Interestingly, Californian species are also present exclusively at or near the bases of these groups.

In monophyletic sister group A (Fig. B), a basal monophyletic group (‘a’) is composed entirely of north-central USA species. A group with two basal Californian species and three apical species from Maryland USA (‘b’) is just basal to a paraphyletic grade in which the three basal-most species (‘c’) are Californian. The paraphyletic grade apical of (‘c’) consists of species from Wyoming, eastern Oregon, Idaho, and California (‘d’). All species apical of the latter are of specimens collected exclusively from southwestern and southeastern USA and Mexico (‘e’).

In monophyletic sister-group B (Fig. E), California species (*A. chumashanus* Fortier, *A. maheono* Fortier, and *A. marinensis* Fortier) are found interspersed with Canadian and north-central USA species at the base. Apically, group B consists of a monophyletic cluster composed of 4 Canadian species and the species from Missouri USA (*A. reisi* Fortier & Sherman) (‘f’), which is immediately basal to a large apical monophyletic cluster composed of species entirely described from specimens only reported from Texas and Mexico (‘g’).

Discussion

Biogeographical inferences

Since almost all species are only known from only one or very few specimens, any inferences about observed distribution patterns across the group are preliminary and speculative. Nonetheless, some patterns are worth mentioning.

The pattern of geographical distribution across the cladogram suggests an origin of the group in the northern Nearctic, since the base of the cladogram consists entirely of species recorded only from this area. The bases of the two large monophyletic groups in the cladogram are also dominated by species only recorded from the northern Nearctic. The basal position of *A. tullyi* with respect to the rest of the group is interesting, since this is the only known species from Alaska, much of which was unglaciated and formed the Beringian corridor between the Nearctic and Palearctic during the last ice age. However all specimens were collected in a formerly glaciated area in southeastern Alaska, much of which remains extensively covered with glaciers. The primary author spent the summers of 2007 and 2008 collecting by Malaise trapping, sweeping, and rearing geometrids for parasites in central Alaska, as well as going through the major Alaskan collections such as that based at the University of Alaska at Fairbanks and that of Mr. Dominique Collet in Sterling, AK, all of which turned up no records of this group. It seems there is no evidence to suggest a Beringian origin for the group.

The pattern further suggests early radiation southward along the west coast to California, which was a glacial refugium during the last ice age, as well as general southerly radiation and diversification southward in two large lineages represented by the apices of the two large monophyletic groups.

Morphological trends

Two prominent morphological trends show congruence with putative biogeographical trends described above: (1) internal angle of curvature of the carapace and (2) presence of foveolate sculpturing. Canadian species throughout the cladogram except *A. huberi* Fortier show basal states for these characters: (1) internal angle of curvature of the carapace greater than 90°, and (2) foveolate sculpturing absent. In contrast, *A. huberi,* which clusters with neither other Canadian species nor with north-central species, shows the most derived states for these characters: (1) internal angle of carapace less than 90°, and (2) extensive foveolate sculpturing present on mesopleuron and carapace. Interestingly, *A. huberi* clusters with southeastern species. Perhaps *A. huberi* represents a northward dispersal at some point after the last ice age.

In contrast, the intermediate and derived states for these characters appear progressively from north-central species at the base of monophyletic sister-group A (Fig. B) through western and southern species to southwestern species. Thus the exclusively north-central species-cluster ('a') is in part characterized by internal angle of carapace less than or equal to 90° (derived), with mesopleuron either with no punctate or foveolate sculpturing (basal) or with sparse punctate sculpturing (intermediate), and metasomal tergites never with punctate or foveolate sculpturing (basal).

Sister-group B consists of basal northern species with basal states for these two characters and the apical Texan-Mexican clade consisting of species with basal and intermediate states for these two characters.

Conclusions

The phylogenetic analysis supports the hypothesis that *A.* (*Tetrasphaeropyx*) is a monophyletic group and includes within it three species formerly thought to form its sister group: *A. arcticus, A. itamevorus,* and *A. maritimus.* Since this group is a large, well-supported monophyletic group, and since it possesses an easily observed morphological synapomorphy (sculptured, carapace-like metasomal tergite IV), *A.* (*Tetrasphaeropyx*) is recognized as a subgenus. The name *Tetrasphaeropyx* Ashmead is conserved as the subgeneric name since *Aleiodes* specimens with the unique carapace-like metasomal synapomorphy have long been treated as *Tetrasphaeropyx*, and since this synapomorphy exactly corresponds to this natural group.

Aleiodes (*Tetrasphaeropyx*) attacks exclusively inchworms (larvae of Geometridae) so far as known. Of the 72 known species within this subgenus, 25, or 35% attack geometrids (Table 3). No other host associations for the group are known.

TABLE 3. *Aleiodes* (*Tetrasphaeropyx*) species and biological information.

Species	Host	Plant
A. accohannocki	*Semiothisia gnophosaria*	*Salix niga*
A. alafuscus	Unknown	
A. anatariatus	*Itame anataria*	
	Semiothisa hebetata	
A. aquaedulcensis	Unknown	
A. aranamai	Unknown	
A. kohook	Unknown	
A. arcticus	*Pymaena fusca*	
A. areolatus	Unknown	
A. argyllacearivorax	*Itame argyllacearia*	
A. arikarai	Unknown	
A. assateaguenus	*Semiothisa aemulataria*	*Acer negundo*
	Semiothisa gnophosaria	*Acer rubrus*
A. axaceei	Unknown	
A. bretti	*Semiothisa aemulataria*	*Acer negundo*
A. brevicellula	Unknown	
A. cartwrightensis	Unknown	
A. catherinensis	Unknown	
A. chisosi	Unknown	
A. chumashanus	Unknown	

Species	Host	Plant
A. citriscutum	Unknown	
A. cochisensis	Unknown	
A. copiosus	Unknown	
A. crassijugosus	Unknown	
A. dabai	Unknown	
A. dakotensis	Unknown	
A. dissiticarina	*Semiothisa dispuncta*	
	Semiiothisa granitata	
	Semiothisa sexmaculata	
	Unknown geometrid	
A. dorsofoveolatus	Unknown	
A. exiguus	Unknown	
A. fernqldellavorax	*Fernaldella fimetaria*	*Xanthocephalum dracunculoides*
A. flavinotaulus	Unknown	*Larrea divaricata*
A. haematoxyloni	Unknown geometrid	*Haematoxylon brasiletto*
A. halifaxensis	*Semiothisa granitata*	
A. hiisiis	Unknown	
A. huberi	*Eupithecia sp.*	
	Eupithecia gibsonata	
A. illiniweki	Unknown	
A. iowensis	Unknown	
A. itamevorus	*Itame brunneata*	
A. jaliscoensis	Unknown	
A. karankawai	Unknown	
A. kisomm	Unknown	
A. wicayazipa	Unknown	
A. luhmani	Unknown	
A. magnoculus	*Semiothisa cyda*	*Prosopis glandulosa*
A. maheono	Unknown	
A. maidunus	Unknown	
A. mannegishii	*Semiothisa cyda*	
A. marinensis	Unknown	
A. maritimus	*Semiothisa granitata*	*Various coniferous trees*
	Semiothisa sexmaculata	
	Semiothisa signaria dispuncta	
A. nigrilatus	Unknown	
A. oaxacensis	Unknown	
A. min	Unknown	
A. pooedooa	Unknown	
A. parabretti	*Semiothisa aemulataria*	*Acer negundo*
A. paracopiosus	Unknown	
A. paraluhmani	Unknown	
A. parareolatus	Unknown	
A. paraselu	Unknown	
A. parasquilaxensis	*Itame anataria*	
A. pilosus	*Fernaldella sp.*	
A. provancheri	Unknown	
A. pseudoanatariaatus	Unknown	
A. quickei	Unknown	
A. quiniguanus	Unknown	
A. reisi	*Macaraia multilinea*	*Juniperus virginianus*
A. sarceei	*Itame brunneata*	
	Semiothisa granitata	
A. secwepemc	Unknown	
A. selu	Unknown	
A. sexmaculativorax	*Semiothisa sexmaculata*	*Larix sp.*
A. shawi	Unknown geometrid	*Cercis sp.*
	Semiothisa aemulataria	*Acer negjndo*
A. squilaxensis	*Itame anataria*	
A. totuyai	Unknown	
A. tulensis	Unknown	
A. tullyi	*Itame andersoni*	*Dryas drummondi*

The cladogram and geographical evidence suggest a northerly Nearctic origin for the *A.* (*Tetrasphaeropyx*) lineage, probably with at least two major southerly radiations. The most derived species in the group are southern, except for *A. huberi*, which may represent a later dispersal event.

Taxonomy

SURFACE SCULPTURING PATTERNS AND WING VENATION TERMINOLOGY

Areolate. Surface divided into small cell (areolae), each cell bordered by raised carinae (Figs. 20, 23).

Carina. Raised ridge.

Carinate. With a pattern consisting of raised ridges which may or may not be straight and parallel (eg: Figs. 2, 4, 29, 33, 37).

Coriaceous. Leather-like or as with tiny overlapping scales; consisting of a pattern of tiny raised lobes, each lobe bordered by tiny sulci (Fig. 17, arrow).

Costate. With a pattern of straight, parallel raised ridges (eg. Figs. 89, 107).

Costulate. With a pattern of thin, delicate raised ridges (costulae) (eg. Figs. 37, 132, 133, 147)

Flange. A projecting edge of a sclerite. In this publication this term refers to the condition of the edge of metasomal tergite IV when it is distinguishable from the surface sculpturing of the rest of that tergite by sculpturing pattern, and often by some degree of recurvation, as a ventro-posterior margin (eg. Figs. 12–17).

Foveolate. With a pitted pattern consisting of small, uniform depressions such that the areas between depressions are not wider than the depressions, as in the punctate condition, nor carinae, as in the areolate condition (eg. Figs. 1, 3, 6, 7, 19, 20).

Punctate. With a pitted pattern consisting of small, uniform depressions such that the areas between depressions are wider than the depressions (eg. Fig. 8)

Rugose. With an irregular pattern of raised ridges or carinae, resulting in a wrinkled appearance (eg. Figs. 106, 112, 128, 137)

Rugocostate. With an irregular pattern of carinae in combination with some discernible longitudinal costae (eg. Figs. 2, 4, 22, 79, 80, 90)

Rugulose. With an irregular pattern of thin, delicate raised ridges or costulae (eg. Figs. 110)

Rugulose-areolate. With a reticulated pattern of carinae (eg. Figs. 12–15, 40, 42)

Rugulocostulate. With an irregular pattern of small, delicate carinae in combination with small, delicate longitudinal costae (eg. Figs. 29, 30, 126, 147) to the condition of the hind-wing RS vein (eg. Fig. D, hind wing RS vein)

HEAD STRUCTURES (Figs. E, F)

Hypostomal carina. Ridge on the posterior surface of the head, joining or nearly joining the occipital carina ventro-laterally, and extending medially to near the area of articulation of the head to the mesosoma.

Malar space. Section of head between ventral edge of compound eye and the base of the mandible.

Oral space. Depressed space delineated ventrally by closed mandibles, posteriorly by labrum, and dorsally by clypeus.

Temple. Dorsal part of gena posterior to the compound eye.

MESOSOMAL STRUCTURES (Fig. E)

Lateral mesoscutal lobes. The mesonotum is subdivided into an anterior scutum and posterior scutellum. Scutum is subdivided by a pair of grooves, or notauli, into a central lobe and two lateral lobes (Fig. 7).

Median carina (of propodeum and metasomal tergites I-III). Predominant median longitudinal raised ridge on a dorsal sclerite (eg. Figs. 1–4, 22, 23).

Median mesoscutal lobe. The central lobe of the mesoscutum, delineated on each side by a Notaulus (Fig. 7).

Notaulus (plural = notauli). In *Aleiodes*, a pair of longitudinal grooves extending from the anterior base of the scutum to a postero-medial rugose area of the scutum, and separating the scutum into three lobes (Fig. 7).

Precoxal sulcus (commonly misnamed sternaulus in braconids (Wharton 2006)). A depressed, variously shaped area of the ventro-medial part of the mesopleuron.

Scutellar disc. The raised median area of the scutellum, variously sculptured in various species of *Aleiodes*.

WINGS: SEE FIGURE 'D' FOR WING VEIN TERMINOLOGY

METASOMA (Fig. E)

Carapace. Usually refers to collective metasomal tergites covering remaining apical terites. In *Aleiodes* (*Tetrasphaeropyx*), this is defined as the curved metasomal tergite IV, which entirely or nearly entirely covers all apical tergites (eg. Figs. 12–17, 152, 153, 156).

Genus *Aleiodes* Wesmael

Aleiodes Wesmael, 1838:94. Type species: *Aleiodes heterogaster* Wesmael. Designated by Viereck 1914.
Schizoides Wesmael, 1838:94 (footnote). Type species: *Aleiodes heterogaster* Wesmael. Aututypic.

Genus *Aleiodes* Subgenus *Tetrasphaeropyx* Ashmead

Tetrasphaeropyx Ashmead, 1889:634. Type species: *Rogas pilosus* Cresson 1872:189

Diagnosis: Face with cyclostome condition, labrum concave, behind mandibles; occipital carina present; metasomal tergites I and II with a prominent median carina; ovipositor short, usually with length half or less length of hind femur; ovipositor sheathes flattened; metasomal tergite IV expanded and more or less curved into a carapace covering remaining apical tergites.

Distribution: North America from southeastern Alaska across Canada, the USA, Mexico as far south as Oaxaca state, and Europe in Scandinavia and Great Britain.

Biology: Koinobiont endoparasitoids of larval Geometridae (inchworm caterpillars). Last living host larval instar is mummified. The parasitic larva pupates inside this mummy. On emergence, the adult parasitoid wasp cuts a round, circular emergence hole in the dorso-posterior region of the mummy to escape.

KEY TO SPECIES OF ALEIODES (*TETRASPHAEROPYX*) ASHMEAD

1	Entire dorsum of metasoma foveate (Fig. 1, 3)	2
--	Entire dorsum of metasoma not foveate, 1 or more tergites rugocostate (Figs. 2, 4, 29, 30, 33, 36, 45, 46, 47, 54, 56, 79, 80, 81, 89, 90, 96, 98, 107, 110), rugose (70, 100, 106, 112) or areolate (23, 70)	11
2(1)	Forewing vein r less than 0.8 length of 3RSa (as in Fig. 31), yellow-orange head and mesoscutum, black metasoma	3
--	Forewing vein r greater than or equal to 0.8 length of 3RSa, color variable (Figs. 10, 11)	4
3(2)	Mesopleuron with yellow venter (USA: NM) (Figs. 5, 73, 74, 75)	*A. dorsofoveolatus* Fortier
--	Mesopleuron with black venter (USA: AZ, CO, NM)	*A. citriscutum* Fortier
4(2)	Mesosoma or metasoma extensively black	5

-- Mesosoma and metasoma entirely yellow or at most, with black on propodeum and/or metasomal tergite I 8
5(4) Mesoscutum entirely or nearly entirely black, shiny-foveate, without coriaceous surface (Fig. 6)..... 6
-- Mesoscutum entirely yellow-orange, foveate, with coriaceous surface (Fig. 7)..... 7
6(5) Vertex shiny-punctate (Fig. 8), metasomal dorsum black (USA: CA) (Fig. 8)..... *A. flavinotaulus* Fortier
-- Vertex shiny-transversely carinulate (Fig. 9), metasomal tergites II-IV yellow-orange (USA: AZ) (Figs. 6, 9) .... *A. cochisensis* Fortier
7(5) Forewing vein r less than length of 3RSa (Fig. 10), mesopleuron and metapleuron entirely yellow-orange (USA: WY) (Figs 1, 3, 7, 10)..... *A. aquaedulcensis* Fortier
-- Forewing vein r greater than or equal to length of 3RSa (Fig. 11), mesopleuron mostly black, metapleuron entirely black (USA: TX) (Fig. 11) ..... *A. brevicellula* Fortier
8(4) Mesoscutum shiny-foveate without coriaceous surface (as in Fig. 6)..... 9
-- Mesoscutum foveate with coriaceous surface (as in Fig. 7)..... 10
9(8) Propodeum and metasomal tergite I entirely yellow (USA: AZ, CO, NM, TX) ..... *A. pilosus* (Cresson)
-- Propodeum and/or metasomal tergite I with black (USA: CO, TX, WY)..... *A. fernaldellavorax* Fortier
10(8) Legs yellow (MEX: Oaxaca)..... *A. oaxacensis* Fortier
-- Legs black (MEX: Oaxaca; USA: TX) ..... *A. tulensis* Fortier
11(1) Metasomal tergite IV with round foveae (Fig. 17)..... 12
-- Metasomal tergite IV without round foveae (Figs. 12–16) 19
12(11) Mesopleuron not extensively foveate (Fig. 18) (USA: MN) (Fig. 18)..... *A. paracatherinensis* Fortier
-- Mesopleuron extensively foveate (Figs. 19, 20) 13
13(12) Soma entirely yellow-orange or orange 14
-- Soma bicolored..... 15
14(13) Metasomal tergite I areolate (as in Fig. 23), lateral ocelli medium, longest diameter greater than 0.9 and less than 1.1 length of ocell-ocular space (USA: NM) (Figs. 20, 23) ..... male *A. areolatus* Fortier
-- Metasomal tergite I rugocostate, lateral ocelli small, longest diameter less than ocell-ocular space (USA: SC) (Figs. 4, 17, 19)..... *A. catherinensis* Fortier
15(13) Metasomal tergite II areolate (Fig. 23)..... 16
-- Metasomal tergite II not areolate; rugocostate 17
16(15) Metasomal tergites I and II yellow (USA: NM) (Figs. 20, 23) ..... *A. areolatus* Fortier
-- Metasomal tergites I and II black (USA: NM, UT) (Fig. 5)..... *A. dorsofoveolatus* Fortier
17(15) Mesoscutum extensively black (CANADA: ON, QC) (Fig. 22)..... *A. huberi* Fortier
-- Mesoscutum entirely yellow..... 18
18(17) Mesopleural venter black, metasomal tergite II entirely yellow (USA: NC)..... *A. selu* Fortier
-- Mesopleural venter yellow, metasomal tergite II black (USA: TX)..... *A. paraselu* Fortier
19(11) Lateral ocelli large, longest diameter greater than or equal to 1.3 length of ocell-ocular distance (Figs. 24, 25) 20
-- Lateral ocelli not large, longest diameter less than 1.3 length of ocell-ocular distance (Fig. 26)..... 33
20(19) Metasoma entirely black (MEX: Durango, Jalisco) (Figs. 24, 31–34) ..... *A. jaliscoensis* Fortier
-- Metasoma not entirely black; either entirely yellow or bicolored..... 21
21(20) Metasomal tergite IV entirely or mostly yellow-orange or tan 22
-- Metasomal tergite IV with extensive black 28
22(21) Longest diameter of lateral ocelli greater than 6.0 length of ocell-ocular distance, ocelli nearly touching eyes, body color pale yellow (MEX: Oaxaca) (Figs. 25, 35–38) ..... *A. haematoxyloni* Fortier
-- Body color not pale yellow, rather yellow-orange; longest diameter of lateral ocelli often larger than ocell-ocular distance, rarely if ever greater than 6.0 length of ocell-ocular space 23
23(22) Longest diameter of lateral ocellus less than 3.0 length of ocell-ocular space 24
-- Longest diameter of lateral ocellus greater than 3.0 length of ocell-ocular space 26
24(23) Large, body length 4.7–5.0 mm, body entirely yellow-orange, dorsal surface of hind tibiae yellow-orange (USA: south TX)..... *A. aranamai* Fortier
-- Diminutive, body length less than 3.5 mm, body bicolored..... 25
25(24) Propodeum yellow-orange (MEX: Nueva Leon) (Figs. 39, 40) ..... *A. quiniguanus* Fortier
-- Propodeum black (USA: southwest TX) (Figs. 41, 42) ..... *A exiguus* Fortier
26(23) Entirely yellow and yellow-orange, metasomal tergite II pale yellow in contrast to yellow-orange in tergites III and IV, metasomal venter usually pale (USA: south TX) (Figs. 27, 29) ..... *A. quickei* Fortier

-- Metasomal tergite II not pale yellow in contrast to tergites III and IV, metasoma often with irregular black markings 27

27(26) Irregular black markings on metasoma, with black laterally and/or along apical edge of tergite III (USA: southern and southwestern TX) (Figs. 28, 30) ..... *A. nigrilatus* Fortier

-- When irregular black markings present, not with black laterally and/or along apical edge of tergite III (USA: south TX; NM) (Figs. 52–55) ..... *A. copiosus* Fortier

28(21) Longest diameter of lateral ocelli less than 3.0 length of ocell-ocular space 29

-- Longest diameter of lateral ocelli greater than 3.0 length of ocell-ocular space 31

29(28) Internal angle of curvature of carapace about 90º (Fig. 48) (USA: NM, TX) (Figs. 43-48) ..... *A. chisosi* Fortier

-- Internal angle of curvature of carapace greater than 90º (Fig. 51) 30

30(29) Vertex coriaceous, without well developed transverse carinae, pronotum sharply declivous antero-medially (Fig.__), mesopleuron venter yellow-orange (USA: AR, MD, TN) (Figs. 12, 49-51) ..... *A. accohannocki* Fortier

-- Vertex transversely carinate (Fig. 99), pronotum shelf-like (Fig. 134), mesopleuron venter black (USA: WY) (Figs. 13, 134–135) ..... *A. kohook* Fortier

31(28) Metasomal tergite IV entirely black, tergite III often with black marking, never entirely black (USA: TX, NM) (Figs. 58, 59) ..... *A. magnoculus* Fortier

-- Metasomal tergites III and IV entirely black 32

32(31) Forewing vein r greater than or equal to 0.75 length of 3RSa, hind femora not black, slightly infumate at most (USA: eastern and southern TX) (Figs. 60-62) ..... *A. mannegishii* Fortier

-- Forewing vein r less than or equal to 0.7 length of 3RSa, hind femora with extensive black in apical half (USA: eastern and southern TX, southern NM and CA) (Figs. 14, 63-64) ..... *A. karankawai* Fortier

33(19) Carapace deep, rounded, internal angle of curvature less than 90º (Fig. A) 34

-- Carapace shallow to nearly flat, or round but internal angle of curvature about 90º (Figs. B, 34, 38, 48, 51) ... 39

34(33) Metasoma entirely black 35

-- Metasoma entirely or nearly entirely yellow-orange 36

35(34) Mesopleuron extensively foveate dorso-anterior to precoxal sulcus (USA: southern CA) (Figs. 70-72) ..... *A. kisomm* Fortier

-- Mesopleuron not foveate, rather rugocostate dorso-anterior to precoxal sulcus (USA: WY) (Figs. 67-69) ..... *A. dabai*

36(34) Wings heavily infumate appearing black or blackish 37

-- Wings lightly infumate or hyaline, not appearing black 38

37(36) Metasomal tergite II costate with thick costae (as in Fig. 4) (USA: SC) ..... *A. alafuscus* Fortier

-- Metasomal tergite II costate with thin costae (Fig. 81) (USA: CO) (Figs. 81, 84) ..... *A. wicayazipa* Fortier

38(36) Metasomal tergite II rugocostate (Fig. 79); metasoma with little or no black (USA: IA, SD) (Figs. 79, 82) ..... *A. iowensis* Fortier

-- Metasomal tergite II with thick costae (Fig. 80); large assymetrical black patches on metasoma (USA: ND, SD) (Figs. 80, 83) ..... *A. dakotensis* Fortier

39(33) Internal angle of carapace less than or equal to 90º,carapace deep or moderately deep (Figs. 14, 16, 17, 48, 78) 40

-- Internal angle of carapace distinctly greater than 90º, carapace shallow (Figs. B, 104, 152, 153) 49

40(39) Metasoma entirely yellow-orange 41

-- Metasoma bicolored or black 42

41(40 Metasomal tergites I and II with straight, regularly spaced thick longitudinal costae (Fig. 89) (USA: IL, WI) (Figs. 85, 89) ..... *A. illiniwekii* Fortier

-- Metasomal tergites I and II rugocostate, costae not straight or regularly spaced, not as thick as in *A. illiniwekii* (Fig. 90) (USA: NE) (Figs. 86, 90) ..... *A. min* Fortier

42(40) Metasoma entirely black 43

-- Metasoma bicolored black and yellow-orange 44

43(42) Mesopleuron extensively foveate (Fig. 71) (USA: CA) (Figs. 70–72) ..... *A. kisomm* Fortier

-- Mesopleuron with sparse or no foveae (USA: ID) (Figs. 76–78). ..... *A. hiisiis* Fortier

44(42) Metasomal tergite II finely rugulocostulate (as in Figs. 29, 30, 45, 46, 50) 45

-- Metasomal tergite II coarsely rugocostate (as in Figs. 33, 96, 98, 135) 46

45(44) Mesoscutum black, legs extensively yellow (USA: AR, MD) (Fig. 88) ..... *A. shawi* Fortier

-- Mesoscutum yellow-orange, legs black (MEX: Durango) (Fig. 87) ..... *A. axaceei* Fortier

46(44) Propleuron and venter of mesopleuron black, metasomal tergites I and II with a few prominent longitudinal carinae, metanotum black, tergite I black in basal half, tergites III and IV entirely black (USA: CA) (Figs. 93-94) ..... *A. pseudoanatariatus* Fortier

-- Propleuron and venter of mesopleuron yellow and otherwise not exactly as above 47

47(46) Tergites III and IV not entirely black, mostly yellow-orange, sometimes with an asymmetrical black blotch (as in Figs. 53, 54, 56, 90) (USA: ND, SD) (Figs. 95, 96)….. ..... *A. arikari* Fortier

-- Tergites III and IV never mostly yellow-orange, usually entirely black or brown 48

48(47) Vertex with several strongly impressed transverse carinae, metasomal tergite III rugose (USA: CA) (Figs. 97-100) ..... *A. totuyai* Fortier

-- Vertex with 1-2 weakly impressed transverse carinae, metasomal tergite III areolate (as in Figs. 23, 70) (USA: OR) ..... *A. parareolatus* Fortier

49(39) Ocelli small, less than 0.9 length of ocell-ocular distance (as in Fig. 26) 50

-- Ocelli medium, greater than or equal to 0.9 length of ocell-ocular distance and less than or equal to 1.2 length of ocell-ocular distance 68

50(49) Pronotum shelf-like antero-medially (Figs. 101, 134) 51

-- Pronotum not shelf-like; steeply declivous antero-medially (as in Fig. 120) 53

51(50) Entirely or nearly entirely yellow-orange (USA: CA) (Figs. 101-104) ..... *A. marinensis* Fortier

-- Bicolored, 1 or more dorsal sclerites entirely black 52

52(51) Metasoma nearly entirely black except tergite II entirely yellow-orange (except tergite II black in some males) (CANADA: AB, BC, YT) (Figs. 91, 92) ..... *A. anatariatus* Fortier

-- Metasomal tergite II entirely or nearly entirely black (USA: CA) (Figs. 105, 106) ..... *A. maidunus* Fortier

53(51) Metasomal tergite II with thick costae (Fig. 107), soma nearly entirely yellow (CANADA: MB, ON) (Figs. 107, 108) ..... *A. crassijugosus* Fortier

-- Metasomal tergite II rugose, rugocostate, or finely rugulocostulate, never with thick costae 54

54(53) Metasomal tergite II finely rugulocostulate, mesoscutum yellow-orange (Figs. 115, 116, 121, 122) 55

-- Metasomal tergite II rugocostate or rugulose, mesoscutum yellow-orange, black, or bicolored 58

55(54) Head black 56

-- Head yellow-orange 57

56(55) Forewing vein r long, greater than 0.8 length of 3RSa, 1CUa short, less than or equal to 0.2 length of 3CUb (CANADA: BC) (Figs. 119, 121, 123) ..... *A. squilaxensis* Fortier

-- Forewing vein r not long, less than or equal to 0.75 length of 3RSa, 1CUa not short, greater than or equal to 0.3 length of 3CUb (CANADA: BC) (Figs. 120, 122, 124) ..... *A. parasquilaxensis* Fortier

57(55) Forewing 2nd submarginal cell short, nearly square, vein r greater than 0.8 length of 3RSa (Fig. 117), 1CUa 0.3 length of 1CUb, mesopleuron nearly entirely black (USA: WI) (Figs. 113, 115, 117) ..... *A. luhmani* Fortier

-- Forewing 2nd submarginal cell elongate, nearly rectangular, vein r 0.6 length of 3RSa (Fig. 118), 1CUa short, 0.2 length of 1CUb, mesopleuron yellow-orange in dorsal half (USA: WI) (Figs. 114, 116, 118)..... ..... *A. paraluhmani* Fortier

58(54) Metasomal tergite II robust rugocostate (Fig. 126), yellow-orange, face extensively black, mesoscutum yellow-orange (USA, eastern CA) (Figs. 125, 126) ..... *A. pooedooa* Fortier

-- Metasomal tergite II without robust rugocostation, either delicately rugocostate or rugulose 59

59(58) Metasomal tergite II rugulocostate, yellow-orange (Figs. 128, 130) 60

-- Metasomal tergite II rugulocostate or rugulose, sometimes, especially in Palearctic specimens (*A. arcticus*) only faintly so; soma black or mostly black 61

60(59) Mesoscutum black or mostly black, metasoma nearly entirely yellow-orange except basal half of tergite I black and tergite II with black, tergite II rugulose, without predominant longitudinal carinae (CANADA: southern QC) (Figs. 127, 128) ..... *A. provancheri* Fortier

-- Mesoscutum yellow-orange, metasomal color similr to *A. provancheri* except tergite II entirely yellow-orange (CANADA: southeastern ON) (Figs. 129, 130) ..... *A. argyllacearivorax* Fortier

61(59) Carapace nearly flat or with antero-posterior curvature developed; in all cases, never with more than the apex of 1 apical tergite uncovered by carapace, or if so then either with black legs and/or with a precoxal sulcus, and metasomal tergites with well developed rugulation 62

-- Carapace often nearly flat, not entirely covering 2 or more smooth apical tergites, nearly entirely black species except yellow-orange legs, mesopleuron coriaceous, without a precoxal sulcus, Palearctic species with tergites I-IV coriaceous and faintly rugulose 66

62(61) Longest diameter of lateral ocellus greater than 0.5 length of ocell-ocular space; vertex coriaceous, without strong transverse carinae(Fig. 133); mesopleuron coriaceous below subalar sulcus (CANADA: AB, ON, QC) (Figs. 131–133)..... some *A. sarceei* Fortier

-- Longest diameter of lateral ocellus less than or equal to 0.5 length of ocell-ocular space 63

63(62) Vertex without strong carinae, granulate (Fig. 133), mesopleuron coriaceous below subalar sulcus (CANADA: AB, ON, QC) (Figs. 131–132)..... some *A. sarceei*

-- Vertex with strong transverse carinae (as in Figs. 24, 99); mesopleuron rugulose below subalar sulcus..... 64

64(63) Soma entirely black, legs entirely or nearly entirely black (USA: AK, nr. Cartwright) (Figs. 154–156)..... ..... *A. tullyi* Fortier

-- Legs entirely or nearly entirely yellow-orange 65

65(64) Head bicolored, black except extensive yellow-orange bordering eyes; mostly yellow-orange metacoxae, yellow-orange metatrochanters; extensive yellow-orange laterally on metasomal tergites I and II; extensive yellow apically on tergites III and IV (CANADA: BC) (Figs. 109, 110) ..... *A. secwepemc* Fortier

-- Soma entirely black, metacoxae and metatrochanters black (CANADA: NL) (Figs. 111-112) .... *A. cartwrightensis* Fortier

66(61) Metasomal tergites with weak rugulose-coriaceous sculpturing, tergite IV entirely or nearly entirely coriaceous in apical half (Palearctic) (Fig. 157)..... *A. arcticus* (Thomson)

-- Metasomal tergites mostly or entirely rugulose 67

67(66) Hind wing vein m+cu pigmented and tubular..... *A. itamevorus* Shaw and Marsh

-- Hind wing vein m+cu an unpigmented wing fold..... *A. maritimus* Shaw and Marsh

68(49) Mesoscutum entirely or extensively yellow-orange..... 69

-- Mesoscutum entirely or nearly entirely black 72

69(68) Pronotum shelf-like antero-medially..... 70

-- Pronotum steeply declivous antero-medially 71

70(69) Metasomal tergite II with predominant widely spaced costae (Fig.135), tergite II entirely yellow-orange (USA: WY) (Figs. 13, 134, 135)..... *A. kohook* Fortier

-- Metasomal tergite II without predominant longitudinal costae (Fig. 137), tergite II bicolored (USA: west-central CA) (Figs. 136, 137)..... *A. chumashanus* Fortier

71(69) Vertex with transverse carinae (as in Figs. 24, 99), tergite I black (USA: MD) (Figs. 138, 143)..... .....some *A. assateaguenus* Fortier females

-- Vertex rugulose, tergite I yellow with black spot on each side of median carina (Fig. 141) (female), or tergite I black (male) (Fig. 142) (USA: MO) (Figs. 139-142) ..... *A. reisi* Fortier and Sherman

72(68) Metasomal tergite II bright yellow-orange..... 73

-- Metasomal tergite II black, sometimes with yellow-orange highlights, face yellow..... 74

73(72) Metasomal tergite II rugocostate with costae usually widely spaced (CANADA: BC, southwestern ON, south-central QC, NB) (Fig. 145)..... *A. dissiticarina* Fortier

-- Metasomal tergite II rugocostate with costae narrowly spaced (Figs. 47, 149)..... 75

74(72) Vertex finely rugulose (Figs. 26), mesopleuron without well-defined carinae below subalar sulcus, rather coriaceous (Fig. 21), carapace internal angle of curvature greater than 45º, carpace shallow (CANADA: NS) (Figs. 21, 26, 146, 149)..... *A. halifaxensis* Fortier

-- Vertex with transverse carinae (as in Figs. 24, 99), mesopleuron with well-defined carinae below subalar sulcus (as in Figs. 18, 71, 92); carapace internal angle of curvature less than 45º, carapace shallow (USA: MD) (Figs. 138, 143)..... *A. assateaguenus*

75(73) Vertex coriaceous or at most with faint rugulation, metasomal tergite II yellow-orange (CANADA:AB) (Figs. 144, 147, 150) ..... *A. sexmaculativorax* Fortier

-- Vertex rugose and/or with transverse carinae, metasomal tergite II pale white-yellow (Fig. 151) (USA: MD).. 76

76(75) Metasomal tergite IV distinctly curved, internal angle of curvature about 135º (Figs.151, 152) .... *A. bretti* Bardon and Fortier

-- Metasomal tergite IV nearly flat, internal angle of curvature apparently nearly 180º (Fig. 153) .... *A. parabretti* Bardon and Fortier

DESCRIPTIONS OF *ALEIODES* (*TETRASPHAEROPYX*) *SPECIES*

Aleiodes (Tetrasphaeropyx) *accohannocki* Fortier new species

Female.—**Body color:** head entirely orange except black ocell-ocular distance, antennal scapes, annelli orange, otherwise antennae black, palps yellow; mesosoma orange except apex of scutellar disc and metanotum usually either black or infumate; propodeum bicolored with black basally; metasomal tergite I bicolored, black basally, yellow-orange apically; tergite II entirely yellow-orange, occasionally infumate with black apically; tergites III and IV black, occasionally tergite III yellow-orange along basal border; forelegs yellow-orange except tarsi black, middle legs and hind legs yellow except tibiae and tarsi black; forewing stigma bicolored, black except yellow in basal corner, wings hyaline, forewing veins variable, often C+SC+R and veins in middle region of wings brown, pale yellow in basal and apical regions of wings; hind wing vein R1 brown, other veins pale, m+cu unpigmented. **Body length:** 3.4–3.75 mm. Forewing length: 3.0–3.25 mm. **Head:** ocelli medium, ocell-ocular distance 0.7–1.1 length of longest diameter of lateral ocellus; 35–42 flagellomeres, all distinctly longer than wide; malar space 1.0–1.1 width of mandibular base and 0.3–0.4 length of eye height; clypeus weakly swollen, medial height 0.8–1.0 length of oral space medial height, oral space small, 0.8–1.0 width of mandibular base; occipital carina not complete at vertex, meeting hypostomal carina ventrally; face coriaceous. **Mesosoma:** pronotum transversely bisected by sulci on sides, sulci scrobiculate in anterior 1/3, not scrobiculate in posterior 2/3, pronotum with costulae ventro-laterally, coriaceous-shiny dorso-laterally; mesoscutum coriaceous, notauli weakly scrobiculate except without scrobiculation in middle 1/3, terminating at antero-lateral corners of postero-medial rugulose area; mesopleuron with diffusely defined precoxal sulcus, precoxal sulcus and entire mesopleruon coriaceous except nitid central disc; propodeum shallowly rugulose, median carina shallow, complete. **Legs:** tarsal claw length greater than or equal to 0.5 width of apex of apical tarsomere, dorsa of hind coxae coriaceous. **Wings:** forewing vein r 0.7 length of 3RSa, second submarginal cell small, elongate-trapezoidal, vein 1CUa 0.3–0.4 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest at middle, vein 1r-m 0.6–0.7 length of 1M, 1M 0.5–0.6 length of M+CU, m+cu a wing crease, 0.6–1.0 length of 1r-m. **Metasoma:** tergite I shallowly costate to rugocostate; tergite II shallowly rugocostate; tergite III rugulocostulate; tergite IV shallowly rugulose, a shallow carapace covering all apical tergites, interior angle of curvature greater than 90°, ventral flange complete apically, not recurved.

Male.—Essentially as in female.

Holotype.—female: USA: MARYLAND, Prince Georges Co., VII-24-1996, col. ASC. Emerged about VIII-10-1996 from geometrid *Semiothisa gnophosaria* (Guenée, 1857) collected from *Salix nigra* Marsh. Deposited in NMNH.

*Paratype*s.—female: MARYLAND, Prince Georges Co., PRCW, VI-1-1996, ASC; emerged VIII-17-1996 from *S. gnophosaria* collected from *S. nigra*; female: MARYLAND, Prince Georges Co., VI-17-1996, col. ASC, emerged from *S. gnophosaria* collected from *S. nigra*;, em. VI-20, 1996; female: MARYLAND, Prince Georges Co., VII-24-1996, col. ASC, emerged from *S. gnophosaria* collected from *S. nigra*; em. VIII-10-1996; female: MARYLAND, Prince Georges Co, Fort Meade, VIII-5-1996, col. ASC, emerged from *S. gnophosaria* collected from *S. nigra*;, em. VIII-19-1996; female: ARKANSAS: Mississippi Co., VIII-28-1967, D-Vac willow, J.C. Nickerson; female: ARKANSAS: Mississippi Co., VIII-28-1967, D-Vac locust, J.C. Nickerson; female: TENNESSEE: Stewart Co., Land Between the Lakes, nr. Model, VI/9-10/1971, D.D. Wilder; male: MARYLAND, Prince Georges Co., Patuxent, VI-13-1996, PRCW, col. ASC, emerged from *S. gnophosaria* collected from *S. nigra*, em. VI-15-1996; male: MARYLAND, Prince Georges Co., VII-1-1996, PRCW, col. ASC, emerged from *S. gnophosaria* collected from *S. nigra*;, em. VIII-7-1996. All paratypes deposited in ESUW.

Biology.—reared from geometrid *Semiothisa gnophosaria* (Guenée, 1857) collected from black willow (*Salix nigra* Marsh.)

Comments.—This species is similar to *Aleiodes shawi* Fortier . It may be distinguished from *A. shawi* as follows: 1) basal antennal flagellomeres orange, in contrast to black in *A. shawi*; 2) metasomal tergite II yellow-orange, in contrast to nearly white in *A. shawi*; 3) propodeum bicolored, in contrast to entirely black in *A. shawi*; 4) venter of mesopleuron yellow-orange, in contrast to black in *A. shawi*; 5) vertex sculpturing smooth or finely strigulate in contrast to widely, coarsely transverse costation in *A. shawi*, and 6) precoxal sulcus with well-defined coriaceous sculpturing, in contrast to faint coriaceous-shiny sculpturing in *A. shawi*.

Etymology.—The specific name refers to the Accohannock people, who are an aboriginal people of Maryland, and who spoke an Algonquian language.

Aleiodes (*Tetrasphaeropyx*) *alafuscus* Fortier new species

Female.—**Body color:** head, mesosoma, metasoma entirely yellow-orange; antennae black, palps yellow-orange; legs nearly entirely yellow-orange except middle and hind tibiae and tarsi brown; wings infumate, veins black basally becoming honey-brown apically; stigmas dark brown. **Body length:** 4.2 mm; forewing length: 3.1 mm. **Head:** ocelli small, ocell-ocular distance 1.9 length of longest diameter of lateral ocellus; mandibular base wide, malar space 1.3 width of mandibular base and 0.5 length of eye height; oral space small, clypeus medial height 0.8 length of oral space medial height, oral space horizontal diameter 0.85 width of mandibular base; occipital carina narrowly incomplete at vertex, face coriaceous. **Mesosoma:** pronotum shelf-like anteriorly, each side transversely bisected by weakly scrobiculate sulcus, pronotum coriaceous ventro-laterally, shiny-coriaceous dorso-laterally, mesoscutum coriaceous, notauli scrobiculate, terminating along lateral edges of postero-medial costate area; mesopleuron with shallow, poorly defined precoxal sulcus, extensively coriaceous, rugocostate in area beneath subalar sulcus, propodeum rugose, steeply declivous in apical half, median carina complete. **Legs:** tarsal claws tiny, metacoxae shallowly rugulose-areolate. **Wings:** forewing vein r 0.65 length of 3RSa, second submarginal cell elongate-rectangular, 1CUa 0.38 length of 1 CUb; hind wing RS slightly sinuate, marginal cell narrowest at middle, 1r-m 0.6 length of 1M, 1M 0.7 length of M+CU, m+cu a pigmented wing fold, 0.6 length of 1r-m. **Metasoma:** tergite I heavily rugose, short, apical width 2.0 length of tergite; tergite II heavily rugocostate; tergite III rugulocostulate; tergite IV areolate, a deep carapace entirely covering apical tergites, internal angle of curvature less than 90º, ventral flange entirely recurved apically.

Male.—Unknown.

Holotype.—female: USA: TEXAS, Grimes County, Navasota, April 7, 1959, W. R. M. Mason, coll. Deposited in NMNH.

Biology.—Host unknown.

Distribution.—known only from type locality in Grimes County, Texas.

Comments.—This species resembles *A. catherinensis* Fortier in: 1) small ocelli; 2) heavily rugose, short metasomal tergite I, width greater than 1.8 tergite length, and 3) areolate-foveate tergite IV forming a deep carapace over all apical tergites such that internal angle of carapace curvature is less than 90º. This species may be distinguished from the latter by: 1) shorter forewing vein r and longer second submarginal cell, vein r less than 0.8 length of 3RSa, in contrast to greater than or equal to 3RSa in the latter, 2) wings infumate in contrast to hyaline in female *A. catherinensis* (however wings are also infumate in male *A. catherinensis*), and 3) legs nearly entirely yellow, in contrast to black in *A. catherinensis*.

Etymology.—The specific name is from the Latin *ala* meaning ‘wing,’ and *fuscus* meaning ‘dark,’ and refers to the black-infumate wings of the species.

Aleiodes* (*Tetrasphaeropyx*) *anatariatus
Fortier 2007a: 17–19

Female.— **Body color**: face black except yellow-orange margins extending entirely around eyes, specimens from northern B.C. and Y.T. with less black; clypeus black or yellow-orange; ventral margin of gena black; frons, vertex black except orange border around eye; occiput black to reddish brown; antennal flagellae black; pronotum entirely black or bicolored black and yellow-orange; propleuron black; scutum black except yellow-orange spots at anteromedial corners of notauli; scutellar disc variable, entirely black or with yellow highlights; mesopleuron yellow-orange or bicolored with black, mesopleuron venter black; propodeum black; metapleuron yellow-orange, bicolored with black, or entirely black; basal half metasomal tergite I with black, semicircular area, apical half of metasomal tergite I yellow-orange; metasomal tergite II entirely yellow-orange; metasomal tergite III sometimes yellow-orange along base, otherwise black; metasomal tergite IV black; coxae, trochanters, trochantellae and tarsi of front legs black, femora and tibiae yellow, middle and hind legs entirely yellow except black tarsi; wings hyaline, stigma and veins brown except front wing (RS+M)b, veins surrounding second submarginal vein, 3RSb, 3M, and hind wing RS colorless. **Body length**: 4.0–5.3 mm; fore wing length: 3.2–3.9 mm. **Head**: 38–45 flagellomeres, all distinctly longer than wide; malar space long, 1.5–1.8 times basal width of mandible and 0.5 times eye height; temple wide, 0.75–0.9 eye width; occipital carina complete at vertex, reaching hypostomal carina; oral space small, circular, about equal to basal width of mandible; ocelli small, longest diameter of lateral ocellus 0.6–0.7 length of ocell-ocular distance; face rugose medially, coriaceous laterally; carinae near mandibular articulation; vertex strongly rugocostate, or rugose-areolate. **Mesosoma**: pronotum sometimes coriaceous anterolaterally, always costate or rugose anterolaterally, rugose-areolate and shiny posterolaterally; mesoscutum coriaceous with sculptured median longitudinal stripe, notauli scrobiculate anteriorly, ending posteriorly in rugose area; scutellar disc rugocostate or rugose-areolate; mesopleuron coriaceous ventrally, precoxal sulcus shallowly concave, sometimes (50%) with carinulae, mesopleuron rugose-areolate anterior of prominent nitid central disc; propodeum rugose-areolate, median carina complete. **Legs:** inner spur of hind tarsus about 0.25 length of hind basitarsus; hind coxae coriaceous, rugose-areolate dorsally, tarsi without apical pectination. **Wings:** front wing with vein r about 0.6 length of 3Rsa and 0.85 to equal to length of m-cu, vein 1cu-a beyond 1M by distance less than length of 1cu-a (0.9–1.0), 1CUa 0.15 to 0.25 length of 1CUb; hind wing with marginal vein slightly recurved, marginal cell narrowest in middle, r-m 0.5–0.6 length of 1M, 1M 0.6–0.7 length of M+CU, vein m-cu present, pigmented or unpigmented, non-tubular, 0.5-0.8 length of r-m and adjoining it. **Metasoma:** tergite I coarsely rugocostate or rugose-areolate; tergite II rugocostate, usually with costae widely spaced (80%), tergite III rugulocostate, tergite IV finely rugulose-areolate, tergite IV a carapace over all apical tergites, basal-apical curvature of tergite IV usually less than 90° (80%), otherwise about 90°.

Male.—As in female except hind coxae sometimes with black (50%), mesoscutum entirely black, metasomal tergite I entirely black, tergite II dark orange with extensive black highlights, tergites I and III coarsely costate.

Holotype.— female: BRITISH COLUMBIA, Milepost 54 Atlin road (Hwy 7) latitude 59.35, longitude -133.38, host *Itame anataria* (Swett.) (Geometridae), emerged April 30, 1959. Deposited in CNC.

Paratypes.— YUKON TERRITORY, female: Alaska Highway Milepost 926, host *Semiothisa hebetata* (Hulst.) (Geometridae) emerged April 30, 1959; female: Whitehorse (McRae) latitude: 60.6960 longitude: -135.1130, host *S. hebetata*, emerged April 30, 1959; male: Mile 32 Dawson Road, Geometridae, emerged April 20, 1959; ALBERTA, female: Nordegg, latitude: 52.4667°, longitude: -116.0833°, host *S. hebetata*, emerged February 13, 1958; female: Eisenhower Junction, latitude 51.2667, longitude -115.9167, July 25, 1962. Malaise Trap, Mason; female: Eisenhower Lookout, latitude 51.3°N, longitude -115.93°, July 25, 1962, Malaise Trap, Mason, male: same data as preceding female. All paratypes deposited in CNC.

Distribution.—Known from type localities in Alberta, British Columbia, and Yukon Territory, Canada.

Host Association.—All known hosts are geometrids of either *Itame anataria* or *Semiothisa hebetata*.

Comments.—A relatively large species, with more antennomeres in some specimens than most *A.*

(*Tetrasphaeropyx*) species. The coarsely rugocostate sculpturing with prominent, widely spaced costae on metasomal tergite II and the strongly rugocostate vertex sculpturing distinguish this species from other similar species that also have the combination of extensive black on head and thorax, and yellow-orange tergite II such as *A. dissiticarina* and *A. sexmaculatavorus.*

Etymology.—Name refers to host species, *Itame anataria*, consumed by the holotype specimen.

Aleiodes* (*Tetrasphaeropyx*) *aquaedulcensis

Fortier 2006b: 467-468

Female.—Body color: head and mesosoma orange except black antennae, scape yellow medially, black interocellar area, propodeum, and black on venter of mesopleuron, metasomal tergites bicolored, tergites I, III and IV with extensive black grading to orange, tergite II lighter, orange with black highlights medially, wing veins, stigmas brown. Body length: about 4.5 mm. forewing length: about 3.6 mm. Head: ocelli small, ocellocular distance about 1.3 of longest diameter of lateral ocellus; 42 flagellomeres, all longer than wide; malar space long, 1.8 of mandibular base length and 0.6 of eye height; occipital carina weakly complete at vertex, meeting hypostomal carina basally; oral space small, circular, about 1.1 of clypeal height; face shallowly areolate over coriaceous surface, setae not course, face mostly bare above clypeus; frons coriaceous; vertex rugocostate with well defined transverse carinae medially. Mesosoma: pronotum scrobiculate mid-laterally, areolate ventrolaterally, shiny-foveolate dorsolaterally; mesoscutum foveate over a coriaceous surface, notauli scrobiculate, posteromedial area of mesoscutum with strong longitudinal carinae; scutellar disc foveate-areolate; mesopleuron foveate, central disc nitid, foveate antero-dorsally, precoxal sulcus concave, carinulate; propodeum foveate-areolate, with steep posterior declivity, median carina incomplete, becoming obfuscated on posterior declivity. Legs: Tarsal claws tiny, not extending to tarsal apex; hind coxae foveate. Wings: forewing with vein r about 0.8 of length of 3RSa, about 0.3 of 3Rsb, about 1.3 of r-m, about equal to m-cu, second submarginal cell elongate and trapezoid, vein 1u-a beyond 1M by a distance of 1.25 of length of 1cu-a and about 0.3 of 1CUb; hindwing vein RS slightly recurved, marginal vein nbarrowest in middle, vein 1r-m about 0.7 of 1M, 1M about 0.5 of M+CU, vein m-cu a weakly pigmented fold about 0.7 of 1r-m. Metasoma: tergites I and II foveate-areolate, median carina of tergite I complete, median carina of tergite II originating from a well developed, flat, nitid raised triangular area basally, weakly complete apically; tergite III foveolate, median carina weakly present in basal 1/3; groove between tergites II and III scrobiculate, longitudinal carinae widely spaced medially, more closely spaced laterally; tergite IV foveolate, a deep carapace over apical tergites, ventral flange entire, recurved, almost white.

Male.—Unknown

Holotype.—Female: USA: WYOMING, Sweetwater Co., 30 mi. SE of Green River, VII July 1977, George Stevens. Deposited in ESUW.

Distribution.—Known only from type locality in Wyoming.

Biology.—Unknown.

Comments.—This species can be distinguished from other species with similar extensive shiny-foveolate sculpturing over the body and deep carapace with complete, recurved, lightly pigmented ventral flange, by the mesosoma almost completely yellow-orange except for bicolored propodeum and black on mesothoracic venter in this species, and metasomal dorsum bicolored. This species is similar to *A. brevicellula* but can be distinguished from that species by the completely yellow-orange mesopleuron and metapleuron, the bicolored metasoma, and the large, elongate, trapezoidal second submarginal cell on the forewing.

Etymology.—The specific name refers to the type locality, Sweetwater County, Wyoming, USA.

Aleiodes (*Tetrasphaeropyx*) *aranamai* Fortier
new species

Female.—**Body color:** head, mesosoma, metasoma entirely orange except interocellar space bicolored with black; antennae orange in basal 1/5–1/2 becoming brown apically; palps yellow; legs orange except some apical tarsomeres usually with black; forewing hyaline with veins honey-yellow basally becoming brown apically, stigma bicolored, yellow basally, brown apically; hind wing veins uniformly pale yellow, vein m+cu an unpigmented wing fold. **Body length:** 4.7–5.0 mm. Forewing length: 3.5–3.6 mm. **Head:** ocelli large, ocell-ocular distance 0.5–0.6 length of longest diameter of lateral ocellus; 39 flagellomeres, 15th flagellomere from base usually (67%) distinctly longer than wide, sometimes (33%) nearly as wide as wide as long, width of these wide flagellomeres greater than or equal to 0.8 length of flagellomere; malar space short, 0.9–1.2 length of mandibular base, 0.3 length of eye height; clypeus weakly swollen, medial height equal to length of oral space medial height, oral space small, circular, horizontal diameter 0.9–1.1 width of mandibular base; occipital carina incomplete at vertex, meeting hypostomal carina ventrally; face coriaceous. **Mesosoma:** pronotum transversely bisected by scrobiculate sulcus at sides, pronotum usually (67%) rugose or costate ventro-laterally, sometimes (33%) coriaceous ventro-laterally, without other sculpturing, in all cases, shiny dorso-laterally; mesoscutum apparently coriaceous, notauli weakly scrobiculate, terminating at lateral edges of postero-medial rugose area; mesopleuron with diffusely defined precoxal sulcus, precoxal sulcus with faint carinulation, otherwise mesopleuron coriaceous except rugocostate in area ventral to subalar sulcus; propodeum weakly, shallowly rugulose with long white setae, median carina complete. **Legs:** tarsal claw length greater than 0.5 apical width of apical tarsomere, dorsum of hind coxa variously sculptured, areolate to punctate. **Wings:** forewing r 0.6–0.7 length of 3RSa; second submarginal cell trapezoidal, vein 1CUa short, 0.2 length of 1Cub; hind wing with vein RS slightly sinuate, marginal cell narrowest in middle, 1r-m 0.6 length 1M, 1M 0.6–0.75 length of M+CU, m-cu an unpigmented wing fold, length 0.5–0.6 length of 1r-m. **Metasoma:** entire metasomal dorsum finely rugulo-carinulate, tergite IV a carapace covering all apical tergites, carapace shallow, interior angle of curvature greater than 90°, ventral flange complete apically, not recurved.

Male.—unknown.

Holotype.—female: USA: TEXAS: Cameron Co., VIII-03-1928; R. H. Beamer. Deposited in SNOW.

Paratypes.—(2 females): same locality, date, and collector as holotype. Deposited in SNOW.

Biology.—host unknown.

Comments.—This species is similar to *A. paracopiosus*. It can be distinguished from that species by the well-defined pattern of dense carinulation on the 4 visible metasomal tergites, in contrast to the less dense rugulocostulate pattern on these tergites in *A. paracopiosus*, and by the basal flagellomeres orange, in contrast to flagella entirely black in *A. paracopiosus*.

Etymology.—The specific name refers to a small agricultural Amerindian tribe, the Aranama people, who lived in what is now Cameron County, Texas, and spoke a Cohuiltecan language. The Aranama people numbered 125 souls in 1822. They were extinct by 1843.

Aleiodes (*Tetrasphaeropyx*) *arcticus* (Thomson 1891)
new combination

Rogas (*Aleiodes*) *arcticus* Thomson 1891:1679. *Rhogas* (*Aleiodes*) *arcticus*: Kokoujev 1898:369. *Aleiodes arcticus*: Hellen 1927:31. *Rogas arcticus*: Kloet & Hincks 1945:213.

Female.—**Body color**: head, antennae, mesosoma, metasoma entirely black, legs yellow-orange except coxa, trochanter, and trochantella black; wings hyaline, veins brown, stigma unicolored brown. **Forewing length**: 3.0 mm. **Head**: ocelli small, ocell-ocular distance greater or equal to 2.0 length of longest diameter of lateral ocellus; flagellomeres nearly as wide as long, width/length about 0.8; malar space 1.4 or greater than width of

mandibular base; temple wide, width 0.9 eye width; occipital carina weakly complete at vertex; head coriaceous. **Mesosoma**: pronotum transversely bisected on each side by scrobiculate sulcus, coriaceous-costate ventro-laterally, coriaceous dorso-laterally; mesoscutum and scutellum coriaceous, notauli weakly scrobiculate, terminating posteriorly at lateral edges of rugulose postero-medial area. **Legs**: tarsal claws not pectinate apically. **Wings**: forewing vein r long, 0.85 length of 3RSa, 2nd submarginal cell short and square, 1CUa short, 0.25 length of 1CUb; hind wing vein RS slightly recurved, marginal cell narrowest at middle, 1r-m 0.6 length of 1M, 1M 0.5 length of M+CU, m+cu pigmented, sclerotized, 0.5 length of 1r-m. **Metasoma**: tergites I–IV weakly rugose- coriaceous, remainder of apical tergites smooth, tergite IV antero-posteriorly curved, carapace-like, internal angle of curvature greater than 90°.

Material examined.—Female: FINLAND, Ks. Salla, 752:61 Vario H., June 26, 1995, reared from geometrid *Pygmaena fusca*, G. Varkowyi, coll. Deposited in NMS.

Distribution.—Known from Norway, Switzerland, Finland, Great Britain, Sweden (Shenefelt 1975)

Biology.—Reared from the geometrid *Pygmaena fusca* Thunberg.

Comments.—This species is similar to *A. itamevorus* and *A. maritimus* in mesopleuron without a defined precoxal sulcus, MT IV a shallow carapace with internal angle of curvature greater than 90° which does not entirely cover 2 or more apical tergites. It can be distinguished from those species by metasomal tergite IV without strongly impressed rugulation.

Aleiodes (*Tetrasphaeropyx*) *areolatus*

Fortier 2006b: 17–20

Female.—Body color: head yellow-orange except inter-ocellar area black, antennae dark brown basally, becoming darker apically, mesosoma yellow-orange except propodeum black, first metasomal tergite with black basally, yellow-orange apically, second tergite yellow-orange, tergite III brown, tergite IV black, legs yellow-orange, wing veins light brown, stigma brown. Body length.— 4.5 mm. *forewing length* 3.25 mm. Head: ocelli small, longest diameter of lateral ocellus less than 1.2 length of ocell-ocular distance; more than 35 flagellomeres (both specimens examined without complete flagella) all longer than wide; malar space long, 1.6 length of mandibular base-length and about 0.5 length of eye height; occipital carina complete at vertex; oral space small, circular, with medial height about equal to medial height of clypeus; mandibular tips crossed when closed; face foveolate over coriaceous surface; frons coriaceous; vertex coriaceous with weak transverse carinulae and with dense, coarse, long white setae. Mesosoma: pronotum scrobiculate midlaterally, foveolate dorsolaterally, coriaceous ventrolaterally; mesoscutum foveate over coriaceous surface, with dense, thick white setae; mesopleuron foveate-areolate dorsally, central disc nitid, precoxal sulcus well developed, concave, carinulate, carinulation extending anteriorly of precoxal sulcus; propodeum foveolate with long, coarse setae, with steep declivity posteriorly, median carina complete. Legs: tarsal claws small, but hind tarsal claws extending to or just past tarsal apex; hind coxae foveolate. Wings: forewing with vein r long, about 0.8 length of vein 3RSa and m-cu, about equal to length of r-m and about 0.25 length of 3RSb, second submarginal cell rectangular, nearly square, vein 1cu-a beyond 1M by distance of about 0.8 of length of 1cu-a and about 0.25 of length of 1CUb; hind wing with vein RS slightly recurved, marginal cell narrowest in middle, vein 1r-m about 0.7 of 1M, 1M about 0.6 of M-CU, vein m-cu absent. Metasoma: tergites I and II foveate-areolate, tergite III more finely foveate-areolate; tergite IV foveate; median carina complete on tergites I and II, a poorly defined raised medial ridge on tergite III; base of median carina on tergite II a well defined, polished triangular area; tergite IV a deep, complete carapace over tergites apical to it, ventral flange complete, recurved, unpigmented.

Male.—Essentially as in female except setae not as long, dense, or coarse as in female, yellow-orange color darker, less black on soma, antennae darker, and occipital carina meeting hypostomal carina.

Holotype.—Female: USA: NEW MEXICO, Eddy Co., 26 mi. E. Carlsbad, VI-8-1977, Malaise trap. Deposited in NMNH.

Paratype.—Male: same data as holotype. Deposited in NMNH.

Distribution.—Known only from type locality in New Mexico.

Biology.—Unknown.

Comments.—This species is similar to other *A.* (*Tetrasphaeropyx*) species that also have a deep, fully developed carapace with ventral flange complete, recurved, and unpigmented. It can be distinguished by the foveate-areolate sculpturing on metasomal tergites I and II, which in part separates it from species such as *A. dorsofoveolatus* with smaller foveae on those tergites, by the scutum sculpturing with widely separated foveate-areolate sculpturing, and by the dense, coarse, long white setae on the scutum of the female. This species is closely similar to *A. parareolatus*, recorded from Oregon USA in coloration and in the distinctive metasomal areolate sculpturing. In may be separated from that species as follows: 1) forewing vein r long, 0.8 length of 3RSa in contrast to forewing vein r short, 0.5 length of 3RSa in the latter species, thus second submarginal cell short and square rather than long and rectangular in the latter species; 2) body densely pilose with long, white setae in contrast to the latter species; 3) medial lobe of mesoscutum and dorsolateral section of pronotum heavily foveolate, in contrast to medial lobe of mesoscutum coriaceous, and dorsolateral section of pronotum shiny without foveae in latter species.

Etymology.—The specific name refers to the distinctive sculpturing that separates this species from similar species with foveate sculpturing.

Aleiodes* (*Tetrasphaeropyx*) *argyllacearivorax

Fortier 2007b: 4

Female.—**Body color**: face entirely yellow-orange except for small brown markings above anterior tentorial pits, inter-ocellar space black, frons black dorsally, temples black adjacent to occipital carina, scapes, annelli yellow, flagellum black, basal 2 maxillary palpomeres yellow, apical 3 brown; pronotum yellow-orange, propleuron dark brown; median mesonotal lobe black antero-medially, otherwise mesoscutum yellow-orange; scutellar disc mostly orange except black at apical edge; mesopleuron nearly entirely black except yellow-orange in antero-dorsal corner; mesopleural venter black; metapleuron and propodeum black; metasomal tergite I black basally and medially otherwise metasoma entirely yellow-orange; legs yellow-orange except tarsi brown; wings hyaline, veins and stigma entirely brown. **Body length**: 3.6 mm; forewing length: 3.24 mm. **Head**: ocelli small, ocell-ocular distance 2.1 length of longest diameter of lateral ocellus; 42 flagellomeres, all distinctly longer than wide; malar space long, 1.5 width of mandibular base and 0.6 length of eye height; clypeus swollen, medial height 1.3 length of oral space medial height, oral space small, circular, horizontal diameter 0.8 width of mandibular base; occipital carina narrowly incomplete at vertex, meeting hypostomal carina ventrally; face rugulose with a few fine transverse carinulae ventral to antennal scrobes. **Mesosoma**: pronotum not shelf-like medially, transverse scrobiculate sulci laterally; mesoscutum apparently coriaceous, notauli weakly scrobiculate, terminating at antero-lateral corners of postero-medial costate area; mesopleuron with precoxal sulcus absent, mesopleuron rugo-costate anterior to central disc; propodeum shallowly areolate, median carina complete. **Legs**: tarsal claws with length greater than 0.5 width of apex of apical tarsomere, not pectinate apically, dorsal surfaces of hind coxae weakly shiny-coriaceous. **Wings**: forewing with vein r 0.55 length of 3RSa, second submarginal cell trapezoidal, nearly rectangular, vein 1CUa short, 0.2 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest in middle, vein 1r-m 0.6 length of 1M, 1M 0.7 length of M+CU, vein m-cu lightly pigmented, weakly sclerotized, 0.8 length of 1r-m. **Metasoma**: Metasomal tergite I finely rugulocostulate; tergite II with closely spaced shallow longitudinal costae; tergites III, IV ruguloscostulate; tergite IV a shallow carapace over apical tergites, ventral flange not recurved apically.

Male.—unknown.

Holotype.—female: CANADA: ONTARIO, Constance Bay, VII-11-1934, G. S. Walley. Deposited in CNC.

Biology.—Reared from geometrid *Itame argyllacearia* (Pack.), the "blueberry spanworm." No host remains associated with holotype specimen.

Comments.—This species in unique in its combination of small size (less than 4mm), fine shallow propodeal sculpturing, finely costate sculpturing on metasomal tergite II, and tergite IV a shallow carapace with internal angle of curvature greater than 90°, covering all apical tergites. It closely resembles *A. provancheri*, and may be distinguished from the latter by 1) fine propodeal sculpturing with extensive minute areolation, in contrast to coarse propodeal sculpturing without minute areolation in the latter.

Etymology.—The specific name refers to the host of the holotype specimen.

Aleiodes (*Tetrasphaeropyx*) *arikarai* Fortier new species

Female.—**Body color:** head entirely yellow-orange except black inter-ocellar area, scape yellow, pedicel yellow or bicolored black and yellow, flagella black; mesosoma yellow-orange except metanotum and propodeum black; metasomal tergites I, II, and IV entirely yellow orange (50%) or yellow-orange with irregular black mottling; legs yellow orange; wings hyaline, veins yellow, stigmas bicolored, yellow basally grading into light brown apically. **Body length:** 4.4–4.6 mm. forewing length: 2.9–3.1 mm. **Head:** 42 flagellomeres, all nearly as wide as long, with width:length ratio of most flagellomeres greater than or equal to 0.8; malar space long, 1.6 width of mandibular base and 0.5 length of eye height; ocelli small, ocell-ocular distance 1.6 length of longest diameter of lateral ocellus; oral space small, circular, median height of clypeus 1.0–1.2 length of oral space median height, oral space horizontal diameter 0.9–1.1 width of mandibular base; occipital carina complete at vertex; face coriaceous; vertex coriaceous with faint transverse carinulae. **Mesosoma:** pronotum bisected on each side with transverse scrobiculate sulcus, pronotum shiny-areolate-rugose dorso-laterally; mesoscutum coriaceous, notauli weakly scrobiculate, terminating posteriorly at lateral edges of postero-medial rugose area, scutellar disc rugose-areolate, carinae with coriaceous sculpturing; mesopleuron coriaceous, sparse punctation anterior of central disc, precoxal sulcus shallow, coriaceous-carinulate; propodeum heavily rugose-areolate, median carina complete. **Legs:** metacoxae coriaceous dorsally, tarsal claws about 0.5 width of apex of apical tarsomere, without apical pectination. **Wings:** forewing with vein short, r 0.5–0.6 length of 3RSa, second submarginal cell trapezoidal, vein 1CUa 0.23–0.28 length of 1CUb; hind wing with vein RS slightly recurved, marginal cell narrowest in middle, vein 1r-m 0.55 length of 1M, 1M 0.8 length of M+CU, m-cu an unpigmented wrinkle 0.7 length of 1r-m. **Metasoma:** tergites I and II heavily rugocostate with deep, thick longitudinal costae; tergite III more delicately and densely rugulocostulate; tergite IV rugulose-areolate, a carapace completely covering apical tergites, ventral flange weakly recurved at apex, internal angle of curvature of carapace greater than 90°.

Male.—unknown.

Holotype.—female: USA: SOUTH DAKOTA, Newell, VI-26-1950, H. C. Severin, coll. Deposited in NMNH.

Paratype.—female: USA: NORTH DAKOTA, Hamar, VII-27-1937, C. L. Johnston, coll. Deposited in SNOW.

Biology.—host unknown.

Distribution.—known only from type localities in west-central South Dakota and northeastern North Dakota.

Comments.—This derived species closely resembles *A. dakotensis* in color, small ocelli, metasomal sculpturing, and carapace shape. It may be distinguished from the latter by 1) vertex coriaceous with faint or no costation or rugation in contrast to strong transverse costae in *A. dakotensis*; 2) mesopleuron nearly entirely coriaceous with no rugation in contrast to rugocostate in *A. dakotensis*, and 3) dorsa of metacoxae coriaceous, in contrast to heavily rugose-areolate in *A. dakotensis*.

Etymology.—The specific name refers to the Arikara People who lived in North Dakota along the Missouri River and practiced maize agriculture before the European invasion.

***Aleiodes* (*Tetrasphaeropyx*) *assateaguenus* Fortier**
new species

Female.—**Body color:** head entirely yellow except inter-ocellar area black; antennae black except scapes with yellow, annelli yellow; palps yellow; pronotum, propleuron entirely yellow, or pronotum infumate dorso-medially; mesoscutum bicolored black and yellow-orange or entirely black; mesopleuron bicolored laterally, venter black; metapleuron, propodeum black; metasoma black except apex of tergite I bordered with dark orange, tergite II entirely dark orange; first 2 pairs of legs yellow except black tarsi, hind legs with yellow coxae, trochanters, trochantellae, femora yellow-orange except black apically; tibiae and tarsi black; wings hyaline, veins dark brown, stigma dark brown, hind wing m+cu a faintly pigmented wing crease. **Body length:** 3.6-4.2 mm, forewing length: 3.3 mm. **Head:** ocelli medium to small, ocell-ocular distance 1.0-1.3 length of longest diameter of lateral ocellus; 42 flagellomeres, all clearly longer than wide; malar space 1.2 width of mandibular base and 0.3-0.4 length of eye height; clypeus weakly swollen, medial height 0.9-1.0 length of oral space medial height; oral space small, circular, horizontal diameter 0.8-0.9 width of mandibular base; occipital carina incomplete at vertex; face coriaceous. **Mesosoma:** each side of pronotum transversely bisected by scrobiculate sulcus, pronotum rugose-areolate-shiny postero-ventrally, shiny postero-dorsally; mesoscutum coriaceous, notauli deep, well defined, with well defined scrobiculation, notauli terminating at lateral edges of postero-medial rugocostate area; mesopleuron with broadly defined precoxal sulcus, precoxal sulcus coriaceous, with a few faint carinulae, mesopleuron heavily punctate on lobe postero-dorsal to precoxal sulcus, central disc punctate on anterior margin, otherwise nitid, area below subalar sulcus rugocostate; propodeum rugocostate, median carina complete. **Legs:** tarsal claws small, length less than 0.5 width of apex of apical tarsomere, without pectination apically, dorsal surface of metacoxae without sculpturing. **Wings:** forewing vein r short, 0.5-0.6 length of 3RSa, second submarginal cell trapezoidal, vein 1CUa 0.3 length of 1CUb; hind wing vein RS slightly sinuate, marginal cell narrowest at middle, 1r-m 0.7 length of 1M, 1M 0.7 length of M+CU, m+cu 0.6-0.7 length of 1r-m, m+cu either a lightly pigmented non-tubular vein or an unpigmented wing fold. **Metasoma:** tergite I rugose-areolate; tergite II rugocostate; tergite III rugulose areolate, median carina ending in apical 3/4-7/8 of tergite; tergite IV rugulose-areolate, a shallow carapace covering apical tergites, interior angle of curvature greater than 90°, ventral flange complete apically, faintly recurved.

Male.—closely similar to female except more extensive black surrounding ocelli, on mesoscutum, and mesopleuron.

Holotype.—female: USA: MARYLAND, Prince George County, PRCW, VIII-6-1996, col. A.S.C., emerged VIII-29-1996 from reared geometrid *Semiothisa aemulataria* (Common Angle) collected from *Acer negundo* (Boxelder). Deposited in ESUW.

Paratypes.—female: USA: MARYLAND: Prince Georges Co., PRCW, VIII-1-1996, col. A.S.C., reared from *S. aemulataria*, collected from *Acer negundo*; male: same location and host data as above, host collected VIII-6-1996, wasp emerged IX-1-1996; male: same location and host data as above, host collected VII-24-1996, wasp emerged VIII-8-1996; male: USA: MARYLAND: Prince Georges Co., Fort Meade, host geometrid *S. gnophosaria* (Hollow-spotted Angle), collected from *Acer rubrum* (Red Maple) VI-17-1996, date of wasp emergence unknown. Paratype specimens deposited in ESUW.

Biology.—Reared from geometrids *Semiothisa aemulataria* (Common Angle) collected from *Acer negundo* (Boxelder) and *S. gnophosaria* (Hollow-spotted Angle) collected from *A. rubrus* (Red Maple).

Comments.—an extensively black-colored eastern Nearctic species with mostly yellow head, small to medium sized ocelli, and metasomal tergite IV a shallow carapace that entirely covers apical tergites, with interior angle of curvature greater than 90°. This species may be distinguished from similarly extensively black eastern Nearctic species *A. cartwrightensis* by 1) the yellow head; 2) ocell-ocular distance about equal to length of longest diameter of lateral ocellus; and 3) rugose-areolate metasoma tergite I, in contrast to black head, lateral ocellus much smaller than ocell-ocular distance, and finely, coarsely rugulose metasomal tergite I in *A. cartwrightensis*.

Etymology.—The specific name refers to a coastal Native American people who hunted, fished, and farmed from Virginia north into Delaware, U.S.A.

Aleiodes (*Tetrasphaeropyx*) *axaceei* Fortier new species

Female.—**Body color:** head, mesosoma entirely yellow-orange except black interocellar trangle, antennae black, palps usually black (80%), occasionally yellow (20%); metasomal tergites I-II yellow-orange, occasionally (40%) tergite I with black mark; tergites III-IV black; legs black except middle and hind coxae yellow, occasionally front coxae yellow (20%); wings hyaline, front wing veins and stigma brown except basal portions of M+CU and 1A pale yellow; hind wing veins pale yellow except R-1 brown. **Body length:** 4.1-4.3 mm. Forewing length 3.5-3.7 mm. **Head:** ocelli medium, ocell-ocular distance 0.9-1.2 length of longest diameter of lateral ocellus; malar space 1.0-1.1 width of mandibular base and 0.3-0.4 length of eye height; clypeus median height 1.0-1.1 length of median height of oral space, oral space small, circular, horizontal diameter 0.9 width of mandibular base; occipital carina weakly complete at vertex; face coriaceous. **Mesosoma:** anterior 2/3 of each side of pronotum transversely bisected by scrobiculate sulcus, pronotum shiny, shallowly rugulose dorso-laterally, mesoscutum coriaceous, notauli deeply impressed, little or no scrobiculation, notauli terminating posteriorly at lateral edges of postero-median rugose area; mesopleuron with well-defined precoxal sulcus, coriaceous-carinulate, mesopleuron sparsely punctate at anterior edge of nitid central disc, rugocostate ventral of subalar sulcus; propodeum shallowly rugose, median carina complete, propodeum with long, white pilosity. **Legs:** tarsal claw length greater than 0.5 width of apex of apical tarsomere, dorsa of hind coxae shallowly rugulose-coriaceous, long pilosity. **Wings:** hyaline, forewing vein r 0.7 length of 3RSa, second submarginal cell elongate-trapezoidal, vein 1CUa 0.3 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest at middle, vein 1r-m 0.6 length of 1M, 1M 0.6 length of M+CU, m+cu a lightly pigmented or unpigmented non-tubular vein 0.6 length of 1r-m. **Metasoma:** tergites I-II rugocostate, tergite III rugulocostulate; tergite IV densely rugulose-areolate, a carapace covering apical tergites, interior angle of curvature of carapace about 90°, ventral flange complete, recurved apically.

Male.—differs from female as follows: 1) mesoscutum bicolored with extensive black, in contrast to entirely yellow-orange in female; 2) propleuron and mesopleural sterna black, in contrast to entirely yellow-orange in female; 3) propodeum black in contrast to entirely yellow-orange or bicolored in female; 4) metasomal tergite I mostly black, yellow apically, in contrast to entirely yellow, or with smaller black mark in female; 5) metasomal sculpturing thicker, bolder than in female.

Holotype.—female: MEXICO: DURANGO, Durango, 6 mi. E, VII-14-1964, W. R. M. Mason, col. Deposited in CNC.

*Paratype*s.—2 females and 1 male; male same data as holotype; 2 females same data as holotype except 6 mi. S. of Durango. Deposited in CNC.

Biology.—unknown.

Distribution.—known only from type location near Durango, Mexico.

Comments.—This species is similar to *A. karankawai*. It may be distinguished from that species as follows: 1) smaller ocelli; ocell-ocular distance 0.8-1.2 length of longest diameter of lateral ocellus, in contrast to 0.4 in *A. karankawai*; 2) longer forewing vein 1CUa, length 0.3 length of 1Cub, in contrast to 0.2 in *A. karankawai*; 3) nearly entirely black legs, in contrast to nearly entirely yellow in *A. karankawai*.

Etymology.—the specific name refers to the Axacee, an indigenous people formerly of northwestern Durango.

Aleiodes (*Tetrasphaeropyx*) *bretti*
Bardon and Fortier in press

Female.— **Body color**: head mostly yellow with two brown spots near the mid occipital carina, antennal flagellomere black, palps yellow; mesoscutum mostly black, notauli extensively yellow; mesopleuron brown dorsally, yellow ventrally; propodeum black; metasomal tergite I black in basal half, pale yellow-white apically, tergite II entirely pale yellow-white, tergites III and IV black; fore and mid legs entirely yellow, hind legs with coxae yellow. Femur yellow basally, brown in apical third, tibia with apical third brown, tarsomeres mostly black with edged apically and basally with yellow; wings hyaline, veins and stigma brown. **Body Length**: 4.4 mm; forewing length: 3.6 mm. **Head**: 37 flagellomeres, all longer than wide; all with width/ length less than 0.83; malar space medium in length, 1.2 width of mandibular base and 0.3 length of eye height; occipital carina incomplete at vertex; ocelli medium, ocell-ocular diameter 0.9-1.1 length of longest diameter of lateral ocellus; facial sculpturing coriaceous with faint transverse carinae ventral to antennal sockets; vertex sculpturing strongly rugocostate. **Mesosoma**: antero-medial portion of pronotum steeply declivous; mesoscutum sculpturing extensively coriaceous, notauli scrobiculate, terminating posteriorly on mesoscutum lateral to median rugulose area; mesopleuron rugose-areolate anterior to nitid central disc, coriaceous immediately posterior to central disc, precoxal sulcus coriaceous; propodeum rugose-areolate, median carina complete. **Legs**: hind coxae rugulo-costulate. **Wings**: forewing vein r 0.67-0.70 length of 3RSa and 0.85 of m-cu, length of vein 1cu-a smaller than the length of the distance between 1cu-a and 1M, 1 CUa short, about 0.28-0.31 length of 1CUb; second submarginal cell rectangular; hind wing marginal vein straight, 1M 1.7-1.8 length of 1r-m, M+CU 1.4 length of 1M, vein m+cu not pigmented, and 0.55-0.70 length of 1 r-m. **Metasoma**: metasomal tergite I areolate-rugulose; tergite II rugulocostulate; tergites III and IV rugulose-areolate, MT IV a carapace almost covering all apical tergites except apex of fifth tergite, carapace with interior angle of curvature about 90 degrees; ventral flange not recurved apically.

Male.— unknown.

Holotype.— female: Maryland, Prince George County; B2614, ex: *Semiothisa aemulataria*: emerged August 1, 1996. Deposited in ESUW.

Paratype.— female: Maryland, Prince George County; B2565, ex: -*Semiothisa aemulataria*: emerged August 1, 1996. Deposited in ESUW.

Biology.— Reared from geometrid *Semiothisa aemulataria*. Host collected from box elder (*Acer negundo*).

Distribution.— Known only from holotype locality.

Comments.— This species resembles *A. shawi* and *A. parabretti* in metasomal color pattern and black propodeum. It also resembles *A. shawi* in having medium sized ocelli with ocell-ocular distance 0.9-1.1 length of longest diameter of lateral ocellus. It can be distinguished from *A. shawi* by mesoscutum entirely black unlike the mostly yellow mesoscutum of *A. shawi*. *A. bretti* can be distinguished from *A. parabretti* by its intermediate carapace with an internal angle of curvature of about 90˚ in contrast to the shallow carapace of *A. parabretti* with internal angle of curvature greater than 90˚.

Etymology.— The species is named in honor of the primary author's grandmother, Helen Brett.

Aleiodes (*Tetrasphaeropyx*) *brevicellula*
Fortier 2006b: 469-470

Female.—**Body color**: head, mesosoma orange except the following black: antennae, mouthparts posterior to mandibles, interocellar area, scutellum except scutellar disc, posterior 2/3 of mesopleuron, metapleuron, and propodeum; metasomal tergites mostly black with orange apical edges, tergites II-IV orange laterally; legs yellow-orange except extensive black on all tarsi, hind coxae; wing veins and stigmas dark brown. **Body length:** 4.0 mm. forewing length: 3.1 mm. **Head:** ocelli small, ocellocular distance about 1.3 length of longest diameter of lateral ocellus; antennae with 36 flagellomeres, all longer than wide; malar space long,

about 1.8 length of mandibular base length and about 0.5 length of eye height; occipital carina complete at vertex; oral space small, round, medial height about 1.25 of medial clypeal height; face with long, coarse white setae, sculpturing shallowly areolate over coriaceous surface; frons coriaceous, and several carinulae running from area immediately dorsal to antennal sockets toward ocelli; vertex shiny- coriaceous, faint transverse carinulae; temples shiny-coriaceous. **Mesosoma**: pronotum bisected laterally by scrobiculate sulci, foveolate dorsolaterally, rugose-areolate ventrolaterally, mesoscutum foveate-coriaceous, notauli weakly scrobiculate anteriorly, otherwise not or only weakly scrobiculate; scutellar disc foveate-coriaceous; mesopleuron extensively foveolate except nitid central disc, precoxal sulcus concave, foveolate; propodeum foveate, steeply declivous in apical 1/2, median carina obfuscated on apical declivity. **Legs**: tarsal claws tiny, not quite extending to tarsal apex; hind coxae foveolate. **Wings**: forewing with long vein r, short 3RSa, small, almost square submarginal cell, with vein r about 1.7 of 3RSa, about 0.3 of vein 3RSb, about 2.2 of r-m, about 1.4 of m-cu, vein 1cu-a beyond 1M by distance of about 1.7 of 1cu-a and about 0.2 of 1CUb; hind wing vein RS a faint fold, slightly recurved, marginal vein narrowest in middle, vein 1r-m about 0.7 of 1M, 1M about 0.5 of M+CU, vein m+cu a faint fold, length about 0.3-0.4 of 1r-m . **Metasoma**: tergite I coarsely foveate, apical width about 2.0 of medial length; tergite II foveate; median carinae of tergites I and II incomplete, terminating before reaching tergite apex; tergite III foveate; tergite IV foveolate-punctate, a deep, complete carapace covering tergites apical to it, internal angle of curvature less than 90°, ventral flange entire, recurved, lightly pigmented.

Male.—Unknown

Holotype.—Female: USA: TEXAS, Culberson Co., 10 mi. N. Van Horn, VIII-27-1971, E. E. Grissell, R. F. Denno Col. Deposited in NMNH.

Distribution.—Known only from type locality in Texas.

Biology.—Unknown.

Comments.—This species falls within a species-cluster which can be distinguished by the following unique combination of characters: 1) heavy foveolate sculpturing on the mesoscutum, scutellum, and metasoma; 2) deep, rounded metasomal tergite IV with interior angle of curvature less than 90°, and 3) forewing vein r length greater than or equal to 0.8 length of 3RSa. Within this cluster, it closely resembles *A. cochisensis* and *A. flavinotaulus* with which it shares the following unique combination of characters: 1) forewing vein r length greater than 1.3 length of 3RSa and second submarginal cell small and square. It can be distinguished from the latter 2 species by the following characters: 1) scutum entirely yellow-orange, in contrast to extensively black in the latter; 2) scutum and scutellum sculpturing with foveate-coriaceous sculpturing, in contrast to foveate-shiny in the latter.

Etymology.—The specific name is from the Latin *brevis*, meaning short, and *cellula*, or small cell, and refers to the small second submarginal cell of the forewing.

Aleiodes* (*Tetrasphaeropyx*) *cartwrightensis

Fortier 2007a: 20-21

Female.—**Body color:** head, mesosoma, and metasoma almost completely black except narrow orange border around eye extending from dorsolateral corner of eye, medially and down along medial edge, then around ventral edge to dorsolateral corner, thus not extending along lateral edge of eye, labrum orange, maxillary palps light brown, labial palps black, base of scape orange laterally, annellus yellow-orange, second and third metasomal tergites with orange highlights under strong light, ventral flange of fourth metasomal tergite yellow-orange, coxae, trochanters all black, trochantelli, femora, tibiae, and tarsi all yellow-orange except apical tarsomeres all black, wings slightly smokey brown, wing veins brown except forewing veins r-m and (RS+M)b not pigmented, and hind wing RS and posterior half of cu-a not pigmented. **Body length:** 4.6 mm; forewing length: 3.7 mm. **Head:** 39 flagellomeres, all slightly longer than wide; malar space long, 1.7 of mandibular basal width and 0.7 of eye height; temple wide, 0.9 of eye width; occipital carina incomplete at

vertex, reaching hypostomal carina; oral space small, circular, horizontal diameter slightly larger than mandibular basal width, medial height of clypeus 0.6 of medial height of oral opening; ocelli small, ocellocular distance about twice diameter of lateral ocellus; face, clypeus coarsely rugulose; frons coriaceous; vertex with a crease between lateral ocelli, a carina extending from medial edge of occipital carina forward about half way toward midpoint between posterior edges of lateral ocellae, otherwise vertex rugulose; temples coriaceous near eyes becoming rugulose posteriorly; genae coriaceous dorsally, rugulose ventrally. **Mesosoma:** scrobiculate flange running along ventral edge of pronotum along anterior half, mid-medial area of pronotum coriaceous-rugulose, posteromedial area scrobiculate, scrobiculate pattern continuing laterally along a sulcus on each side dividing ventro-lateral and dorso-lateral areas, ventro-lateral areas rugulose becoming sequentially coriaceous, then costate laterally; dorsolateral areas costate; scutum areolate-rugulose over a more coriaceous surface except scrobiculate notauli and more coarsely ruglose postero-medial area; scutellar disc rugulose over coriaceous surface; mesopleuron rugulose except posterior half of subalar sulcus carinate becoming nitid posteriorly; propodeum areolate-rugulose, postero-lateral humps blunt; metapleuron areolate-rugose ventrally, with faint rugulae over a minutely areolatte surface dorsally. **Legs:** tarsal claws moderate in size, pectinate basally only, inner apical spurs of hind tibiae about 0.4 of length of hind basitarsi; hind coxae areolate-rugulose dorsally. **Wings:** forewing with vein r 0.6 length of 3Rsa and about 0.8 of length of m-cu, vein 1cu-a beyond 1M by distance about equal to length of 1cu-a, 1CU-a about 0.2 length of 1CU-b; hind wing with marginal vein not tubular and slightly recurved, marginal cell narrowest in middle, 1M about 1.7 of length of r-m, M+CU about 1.7 of length of 1M, vein m-cu present and pigmented, about 0.7 of length of r-m and immediately posterior to it, adjoining it. **Metasoma:** first tergite heavily areolate-rugose, median carina complete; second tergite rugulocostate, median carina originating basally from a small triangular raised area and complete apically; fourth tergite finely areolate-rugulose, shallowly carapace-like, completely covering remaining tergites, ventral flange broad with irregular scrobiculation, discontinuous with sculpturing of tergite, strongly recurved anteriorly, weakly apically; ovipositor sheaths completely covered by fourth tergite, ovipositor about 0.9 of length of hind basitarsus.

Male.—unknown.

Holotype female.—LABRADOR, Cartwright, 25-VII-1955, E. F. Cashman, deposited in CNC.

Biology.—unknown.

Comments.— A species with a nearly all-black soma, yellow-orange legs, small ocelli, and heavy, tightly rugose sculpturing on metasomal tergites. The only other Nearctic all-black *Aleiodes* (*Tetrasphaeropyx*) species are male *A. anatariatus* and *A. secwepemc*, neither of which has only been found east of Alberta. This species may be distinguished from male *A. anatariatus* by lack of prominent longitudinal costae on metasomal tergite II which are present in the latter. It may be distinguished from female *A. secwepemc* by the following: 1) all-black head, in contrast to extensive yellow and black in the latter; 2) metasoma entirely black, in contrast to extensive yellow laterally on metasomal tergites I and II, and apically on tergites III and IV in the latter; 3) black metacoxae and metatrochanters, in contrast to these sclerites respectively mostly and entirely yellow in the latter species. Female *A. cartwrightensis* is indistinguishable from male *A. secwepemc* except by presence of the ovipositor.

Etymology.—Name refers to type locality in Cartwright, Labrador.

Aleiodes* (*Tetrasphaeropyx*) *catherinensis

Fortier 2006b: 471-472

Female.— **Body color**: Body orange except mandibular tips, maxillae, and all palps black; antennae black except annuli brown, bases of ocelli black, legs except coxae black, wings slightly infumate, stigmas black, veins black except apical 2/3 of forewing 3M present as a fold, hind wing RS present as a fold, and 1M becoming progressively paler apically. **Body length**: 4.7 mm, wing length: 3.6 mm. **Head**: 44 flagellomeres, middle flagellomeres with length equal to width, basal 9 and apical 11 flagellomeres slightly longer than wide, malar space long, 1.6 basal width of mandible and 0.5 eye height; temple broad, about 0.8 of eye width;

occipital carina complete at vertex; oral space small, horizontal width about equal to basal width of mandible; clypeus broad, medial height about equal to medial height of oral opening; ocelli small, ocell-ocular distance about 2.0 diameter of lateral ocellus; face shallowly, faintly areolate over a coriaceous surface, a thin, faint median ridge arising from midpoint between anterior edges of antennal bases and running about halfway down face; frons with transverse weak carinae; vertex with heavy transverse costae; temples coriaceous, receiving terminal ends of costae from vertex. **Mesosoma**: anteromedial section of pronotum shelflike, faintly coriaceous and shining, pronotum bisected laterally by scrobiculate sulci dividing each side into dorso-lateral and ventro-lateral areas, dorsolateral areas faintly areolate, ventrolateral areas rugose; scutum rugocostate-coriaceous, notauli crisscrossed with rugocostate sculpturing of scutum, postero-medial area strongly rugocostate over smooth surface; scutellar disc areolate; mesopleuron costate in extreme anterior corner becoming areolate, then foveate over coriaceous surface over central disc, extreme posterior area of central disc nitid, densely foveate posterior to central disc, precoxal sulcus concave, areolate anteriorly, carinate posteriorly; propodeum areolate-rugose. **Legs:** tarsal claws pectinate basally only, length of inner spurs of hind tibiae about 0.3 length of hind basitarsi; hind coxae shallowly foveolate basidorsally, otherwise smooth-costate dorsally. **Wings:** forewing with vein r long, about 0.9 of length of 3Rsa and about equal to m-cu, second submarginal cell blocky rectangular, vein 1cu-a beyond 1M by distance 1.5 of length of 1cu-a, 1CUa long, about 0.4 length of 1CUb; hind wing with vein RS not tubular, slightly recurved, marginal cell narrowest in middle, 1M about 0.6 length of 1r-m, M+CU about 0.9 length of 1M, m+cu present, pigmented, about 0.6 length of 1r-m and immediately posterior to it, adjoining it. **Metasoma:** tergite I rugose, heavy median carina complete; tergite II rugocostate, median carina complete, originating basally from small raised triangular area and continuous apically with median carina of tergite III; tergite III areolate-rugose, some carinae continuous with those of tergite II across suture at interface of tergites, median carina weakly complete apically; tergite IV entirely areolate, deep carapace completely covering remaining tergites, internal angle of curvature less than 90°, narrow scrobiculate flange along entire ventral margin; ovipositor about 0.5 of hind basitarsus.

Male.—smaller than female, body length 4.1 mm, wings more heavily infumate, nearly black.

Holotype female.—USA., GEORGIA: Liberty Co.; Saint Catherine's Island; 24-28/IV/1972, Thompson & Picchi, colls. Deposited in NMNH.

Paratype male.—USA, SOUTH CAROLINA: Dorchester Co., 1?VI/1958, F.W. Mead. Deposited in NMNH.

Distribution.—Known only from type localities in Georgia and South Carolina USA.

Biology.—Unknown.

Comments.—An all-orange species with black antennae, palps, and legs, infumate wings with dark veins, heavily rugulose metasoma, and heavily foveolate mesopleuron. The only other species with rugulose metasoma and black legs is *A. axaceei*, found in Durango, Mexico. This species differs from the latter as follows: 1) metasomal tergites III – IV orange in contrast to black in the latter; 2) vertex with heavy transverse costae in contrast to vertex coriaceous in the latter; 3) metasomal tergites I and II with coarse, thick costae, in contrast to fine costae in the latter.

Etymology.—Named after the type locality of Saint Catherine's Island, Georgia.

Aleiodes (*Tetrasphaeropyx*) *chisosi* Fortier new species

Female.—**Body color:** head entirely yellow except for black inter-ocellar triangle; antennae and palps brown; pronotum and propleuron yellow-orange; mesoscutum, scutellum, mesopleuron, and metapleuron entirely yellow-orange; propodeum mostly black except yellow-orange apically; metasomal tergite I mostly black except pale yellow apically; tergite II pale yellow; tergite III mostly black except yellow laterally and apically; tergite IV entirely black; forelegs yellow-orange, middle and hind legs yellow-orange basally, femora brown apically, tibiae and tarsi entirely brown; wings hyaline, forewing veins and stigma dark brown except basal

sections of M+CU and 1A pale, base of parastigma pale, hind wing veins all pale. **Body length:** 3.7 mm; fore wing length 3.1 mm. **Head:** ocelli large, ocell-ocular distance 0.7 length of longest diameter of lateral ocellus; 36 flagellomeres, all distinctly longer than wide; malar space short, 0.8 width of mandibular base and 0.3 length of eye height; clypeus swollen, medial height equal to oral space medial height; oral space small, circular, horizontal diameter 0.8 width of mandibular base; occipital carina incomplete at vertex; face with minutely sculptured surface. **Mesosoma:** pronotum with transverse scrobiculate sulci mid laterally; mesoscutum coriaceous, notauli without scrobiculation, terminating at antero-lateral corners of postero-medial rugulose area; precoxal sulcus of mesopleuron a weakly defined concavity, finely carinulate, mesopleuron costate below subalar sulcus; propodeum rugose-areolate, median carina complete. **Legs:** length of tarsal claws about 0.5 apical width of apical tarsomere, not pectinate apically, dorsal surface of metacoxae weakly areolate over minutely sculptured surface. **Wings:** forewing vein r 0.6 length of 3RSa, second submarginal cell elongate-trapezoidal, vein 1CUa 0.3 length of 1CUb; hind wing vein RS slightly sinuate, thus marginal cell narrowest in the middle, 1r-m 0.6 length of 1M, 1M 0.6 length of M+CU, vein m+cu an unpigmented fold, 0.4 length of 1r-m. **Metasoma:** tergite I finely rugulose-areolate; tergite II rugocostate to rugulocostulate; tergites III - IV rugulocostulate; tergite IV a carapace over apical tergites, interior angle of curvature about 90°, ventral flange slightly rucurved apically.

Male.—differs from female in extensive black coloration on propleuron, mesoscutum, venter of mesopleruon, hind coxae, metapleuron, and metasoma; also differs in having coarser sculpturing on metasomal tergites.

Holotype.—female: USA: TEXAS, Brewster Co., Big Bend National Park, No. Rosillos Mts., N 29.56°, W 103.25°, 936 m, light, Wharton R.A. & Woolley J.B. X-03-1991. Deposited in TAMU.

Paratypes.—male: USA: TEXAS, same locality information as holotype, Wharton & Woolley, III/17-21/1992; male: USA:TEXAS, Val Verde Co., Seminole Canyon State Park, malaise, III/14-15/1999, Wharton & Buffington; male: USA: NEW MEXICO, Chavez Co., Lower Penasco, VIII-31-1966, K. S. Hagon. All paratypes deposited in TAMU.

Biology.—host unknown.

Comments.—This species is similar to *A. exiguus*. It can be distinguished from that species by 1) the finely rugulose-areolate sculpturing of tergites II and III in contrast to the rugocostate sculpturing of those tergites in *A. exiguus*, 2) the latter's smaller body length (3.0 mm) in contrast to body length of 3.7 mm in this species, and 3) palps yellow, rather than brown, as in *A. exiguus*.

Etymology.—the specific name refers to the Chisos Indian people who were the first people of the early historic period known to have inhabited the Big Bend area where the holotype was collected.

Aleiodes (*Tetrasphaeropyx*) *chumashanus* Fortier new species

Female.—**Body color:** head yellow-orange except the following black: interocellar triangle, antennal flagella, maxillae, and all palps; mesosoma yellow-orange except black propleuron, mesopleural venter, and propodeum bicolored with black and yellow-orange; metasomal tergites I and II bicolored; tergites III and IV black; foreleg coxae black, other coxae yellow-orange; all trochanters and trochantella black; all femora yellow-orange or mostly yellow-orange (hind femora); all tibiae and tarsi black; wings hyaline, forewing veins yellow basally becoming dark brown apically, stigmas dark brown; hind wing veins yellow except black 1R. **Body length:** 4.0 mm. Forewing length: 3.3 mm. **Head:** ocelli small, ocell-ocular distance 1.4 length of longest diameter of lateral ocellus; 43 flagellomeres, most flagellomeres nearly as wide as long, width of tenth flagellomere 0.8 length of flagellomere; malar space long, 1.5 width of mandibular base and 0.5 length of eye height; median height of clypeus 0.75 length of oral space median height, oral space small, horizontal diameter 0.8 width of mandibular base; occipital carina strongly complete at vertex; face coriaceous. **Mesosoma:** pronotum flat, shelf-like medially, laterally bisected with transverse scrobiculate sulci, finely

rugulose in ventro-lateral corners, coriaceous-shiny dorso-laterally; mesoscutum coriaceous with faint, shallow punctation on lateral lobes, notauli shallowly impressed, terminating at antero-lateral corners of postero-median rugocostate area; mesopleuron with shallowly concave, diffusely defined, coriaceous sternaular area, mesopleuron with punctate lobe dorso-posteriorly of sternaular area, central disc with punctations on anterior margin, otherwise nitid, area ventral to subalar sulcus rugulose; propodeum rugose-areolate, median carina complete apically. **Legs:** tarsal claws greater than 0.5 width of apex of apical tarsomere, without apical pectination, dorsal surface of hind coxae shallowly areolate, long pilosity. **Wings:** forewing vein r long, 0.8 length of 3RSa, second submarginal cell small, nearly rectangular, 1CUa short, 0.2 length of 1CUb; hind wing RS slightly sinuate, marginal cell narrowest at middle, 1r-m 0.65 length of 1M, 1M 0.6 length of M+CU, m+cu an unpigmented wing crease, 0.5 length of 1r-m. **Metasoma:** tergite I heavily rugose; tergite II rugocostate to rugose; tergite III more finely, densely rugocostate; tergite IV foveate, a complete carapace over apical tergites, interior angle of curvature greater than 90°, ventral flange incomplete, not recurved apically.

Male.—unknown.

Holotype.—female: USA: CALIFORNIA: San Luis Obispo Co., Paso Robles, at light, J. A. Chewek, J. A. Powell, colls. Deposited in UCB.

Biology.—host unknown.

Distribution.—known only from holotype location.

Comments.—bright yellow-orange mesoscutum and mesopleuron contrast with black propleuron and mesopleural venter; unique carapace combination of foveate sculpturing and shallow angle of curvature.

Etymology.—The specific name refers to the Chumash people, who were the original inhabitants of San Luis Obispo county, the type locality of the species.

Aleiodes* (*Tetrasphaeropyx*) *citriscutum

Fortier 2006b: 474-475

Female.—Body color: antennae black except orange annellus, head, mesosoma bright yellow-orange except interocellar area, palps, mesosternum, and propodeum black, metasoma black, forelegs tan, other legs black, wing veins brown, stigma black. Body length: 4.25 mm. forewing length: 3.25 mm. Head: ocelli small, ocellocular distance 1.3 of longest diameter of lateral ocellus; 40 flagellomeres, all longer than wide; malar space long, 1.4 width of mandibular base and 0.5 length of eye height; occipital carina complete (66%) or narrowly incomplete (33%) at vertex; oral space height about 1.1 of clypeal height; face, frons coriaceous; vertex rugulocostate with strongly impressed transverse-running costae. Mesosoma: pronotum partly regressed underneath mesoscutum posteromedially, shelf-like anteromedially, scrobiculate mid-laterally, areolate dorso-laterally, foveolate ventro-laterally; mesoscutum and scutellar disc foveolate-coriaceous, notauli weakly scrobiculate; mesopleuron foveolate, central disc nitid, precoxal sulcus shallowly concave, carinulate; propodeum heavily foveate, median carina complete. Legs: tarsal claws tiny, not extending to tarsal apex; hind coxae punctate. Wings: forewing with vein r variable, 0.75 – 1.0 length of 3RSa, second submarginal cell square to trapezoidal, vein 1CUa short, 0.24-0.30 length of 1CUb; hind wing vein RS slightly recurved, marginal cell narrowest in middle, vein 1r-m about 0.6 length of 1M, 1M about 0.7 length of M+CU, vein m-cu faint, nontubular, length about 0.25 of r-m. Metasoma: foveate basally becoming foveolate apically, median carinae of tergites I and II complete, median carina of tergite III running about 0.8 of tergite length before apical terminus; groove between tergites II and III deep and scrobiculate; tergite IV a deep, complete carapace over apical tergites, internal angle of curvature less than 90°, ventral flange entire, recurved.

Male.— coloration as in female; metasomal tergites I and II rugose-areolate in contrast to foveate in female.

Holotype.—Female: USA, ARIZONA, Molino Basin, Coronado National Forest, IV/23-24/1981, B. & C. Dasch. Trap. Deposited in AEI.

Paratypes.—Female: USA, ARIZONA, Pima Co., Kitt Peak, 5000 ft. (W. of Tucson), III-28-1970, O. R. Taylor & Party. Deposited in SNOW. Female: USA, COLORADO, Boulder Co, Valmont Butte, VI/07/1961, B.H. Poole. Deposited in NMNH. Female: USA: UTAH, San Jaun Co., 5 mi. E. La Sal, VII/13/1988. B. Scoccia, coll. Deposited in UCD.

Biology.—Unknown.

Comments.—A combination of bright yellow-orange head and mesosomal coloration contrasting with black metasomal color, and the extensive foveate sculpturing over most of the body distinguish this species. It can be distinguished from *A. dorsofoveolatus*, a closely related species, by its black mesopleural venter, in contrast to orange in the latter species. It may be distinguished from other species with similar coloration by its heavily foveolate mesopleuron.

Etymology.—The specific name refers to the bright yellow-orange coloration of the mesoscutum.

Aleiodes* (*Tetrasphaeropyx*) *cochisensis

Fortier 2006b: 476

Male.—*Body color*: flagellum black, head orange except vertex with extensive black; pronotum yellow-orange, propleuron black; mesoscutum bicolored, black except orange patches at baso-medial edges of notauli, notauli orange; scutellar disc orange; mesopleruon, metapleuron, and propodeum black; metasoma orange, first tergite infumate with black, legs orange except all tarsi, hind coxae with black; wings hyaline, veins light brown to honey yellow, stigma bicolored with yellow in basal corner, otherwise brown. Body length: about 4 mm; *forewing length* about 2.7 mm. Head: ocelli small, ocell-ocular distance 1.6 length of longest diameter of lateral ocellus; flagella of holotype broken, more than 24 flagellomeres, all longer than wide; malar space about 1.5 of mandibular baselength and about 0.5 of eye height; occipital carina complete at vertex; oral space small, circular, medial height about equal to medial height of clypeus; face foveolate, frons faintly punctate over coriaceous surface laterally, vertex shiny with faint transverse carinulae. Mesosoma: pronotum bisected on each side by scrobiculate sulci, shiny-foveate dorso-laterally, shiny-areolate antero-laterally; mesoscutum shiny-foveolate, notauli scrobiculate anteriorly, postero-medial area rugose; scutellar disc shiny-foveolate; mesopleuron shiny-foveolate, central disc nitid posteriorly, precoxal sulcus deeply concave with 2-3 dorsoventrally running carinulae; propodeum rugose-foveolate, median carina complete, propodeum with steep posterior declivity. Legs: tarsal claws well developed, longer than 0.5 width of apex of apical tarsi, pectinate basally only; hind coxae foveolate. Wings: forewing vein r long, second submarginal cell short, vein r about 1.8 length of 3RSa, about 0.4 length of 3RSb, about 1.3 length of r-m, and about 1.2 length of m-cu, length of vein 1cu-a about equal to 1CUa and about 0.25 of 1CUb; hind wing vein RS a faint wrinkle, slightly recurved, marginal cell narrowest in middle, vein 1r-m length about 0.6 of 1M, 1M about 0.55 of M+CU, vein m+cu a faint wrinkle, about 0.75 of 1r-m. Metasoma: tergites I and II foveate, median carina of tergite I incomplete, not reaching tergite apex; well developed, raised, nitid baso-medial triangle present on tergite II but median carina absent; tergites III and IV foveolate, tergite III with a faint raised medio-longitudinal ridge on basal half; tergite IV a deep carapace covering apical tergites, interior angle of curvature less than 90º, ventral flange entire, recurved, white.

Female.—Unknown

Holotype.—Male: USA: ARIZONA, Cochise Co., Douglas, latitude: 31.344N, longitude: -109.544 W, V-18-1937, W. Benedic. Deposited in SNOW.

Distribution.—Known only from type locality in Arizona.

Biology.—Unknown.

Comments.—This species falls within a species-cluster which can be distinguished by the following unique combination of characters: 1) heavy foveolate sculpturing on the mesoscutum, scutellum, and metasoma; 2) deep, rounded metasomal tergite IV with interior angle of curvature less than 90º, and 3) forewing vein r length greater than or equal to 0.8 length of 3RSa. Within this cluster, this species closely

resembles *A. brevicellula* and *A. flavinotaulus* with which it shares the following unique combination of characters: 1) forewing vein r length greater than 1.3 length of 3RSa and 2) second submarginal cell small and square. It can be distinguished from *A. brevicellula* by the following: 1) mesoscutum extensively black, in contrast to entirely yellow-orange in the latter; 2) mesoscutum and mesoscutellum shiny-foveolate, in contrast to shiny-coriaceous in the latter. It can be distinguished from *A. flavinotaulus* by the following: 1) vertex with shiny-transverse strigulate sculpturing, in contrast to shiny-foveolate sculpturing in the latter; 2) coloration of metasomal tergites I-III entirely yellow-orange, in contrast to entirely black in the latter.

Etymology.— The specific name is from the type locality, Cochise County, Arizona, USA.

Aleiodes (*Tetrasphaeropyx*) *copiosus* Fortier new species

Female.—**Body color:** entirely yellow-orange except black inter-ocellar triangle, black antennae; often with irregular black blotches on metasomal tergites, sometimes on mesosoma; tarsi with black; wing veins yellow, stigma variable, usually bicolored, darker apically, yellow basally, often entirely yellow. **Body length:** 3.6-4.0 mm; forewing length: 3.1-3.8 mm, usually closer to 3.1mm. **Head:** ocelli large, usually nearly touching eyes, ocell-ocular distance usually 0.2 length of longest diameter of lateral ocellus, 38-39 flagellomeres, all distinctly longer than wide; malar space short, 0.6-1.0 width of mandibular base and 0.2 length of eye height; clypeus weakly swollen, clypeus medial height 0.8-1.0 length of oral space medial height; oral space small, circular, horizontal diameter 0.8-1.0 width of mandibular base; occipital carina incomplete at vertex; face coriaceous. **Mesosoma:** pronotum transversely bisected by weakly scrobiculate sulcus on each side, shiny-rugulose dorso-laterally; mesoscutum coriaceous, notauli either with weak, sparse scrobiculation or with none, notauli terminating at antero-lateral corners of postero-medial rugose area; mesopleuron with broadly defined precoxal sulcus, usually antero-posteriorly elongate with minute areolation and carinulation, minute areolation in area surrounding steraulus, costate ventral to subalar sulcus, sparse punctation on anterior surface of central disc; propodeum with fine, shallow rugulo-areolation, postero-lateral tubercles present, not prominent, median carina complete. **Legs:** tarsal claw length greater than half the width of apical tarsomere apex, not pectinate apically, dorsal surface of hind coxae coriaceous. **Wings:** forewing vein r 0.5-0.7 length of 3RSa, second submarginal cell trapezoidal, vein 1CUa short, length 0.1-0.25 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest in middle, vein 1r-m 0.6 length of 1M, 1M 0.7 length of M+CU, vein m+cu an unpigmented fold, 0.5-0.6 length of 1r-m. **Metasoma:** tergites I and II finely, shallowly rugulo-costulate; tergites III and IV finely, shallowly rugulose-areolate; tergite IV a complete carapace covering apical tergites, interior angle of curvature of carapace about 90º, ventral flange complete apically, usually not recurved apically.

Male.—essentially as in female.

Holotype.—female: USA: TEXAS, Big Bend National Park, Boquillas, 1800 ft., V-13-1959, W. R. M. Mason. Deposited in CNC.

Paratypes.—2 females and 4 males: USA: TEXAS, Cameron Co., Port Isabel, VI/20-23/1948 Deposited in CNC; female: USA: TEXAS, Live Oak Co., Three Rivers, VI-27-1938, L. W. Hepner Deposited in CNC; female: USA, NEW MEXICO, Dona Ana Co., Mesilla Park, VII-12-1917 [collector unknown] Deposited in CNC; female: USA:TEXAS, San Patricio Co., Welder Wildlife Refuge, IV-06-1989, E. A. Sugden Deposited in CNC; female: USA: NEW MEXICO, Luna Co., Deming, VII-12-1917 [collector unknown] Deposited in TAMU; male: USA: NEW MEXICO, Luna Co., Deming, VII-12-1917 [collector unknown] Deposited in NMNH; male: USA, TEXAS, Dimmit Co., Chaparral WMA, IX-30-1989, at light, J. C. Schafffner Deposited in TAMU; male: USA, TEXAS, Jim Wells Co., VII-24-1928, L. D. Beamer. Deposited in TAMU; male: USA, ARIZONA, Cochise Co., July 20, 1917. Deposited in NMNH.

Biology.—host unknown.

Comments.—An entirely or nearly entirely yellow-orange species with large ocelli and finely rugulose

metasomal sculpturing. This species is similar to *A. quickei* Fortier (2007a) but may be distinguished from that species by darker yellow-orange coloration on metasomal tergite II and also on the metasomal sterna, in contrast to pale white-yellow coloration in *A. quickei* on those tergites. This species commonly has irregular black mottling on various metasomal tergites, and less commonly, on various mesosomal sclerites. It may be distinguished from other similarly colored species with similar metasomal sculpturing by the unusually large ocelli, with longest diameter of lateral ocellus 4x or more length of ocell-ocular distance.

Etymology.—The specific name refers to the relatively large number of specimens of this species in various collections relative to numbers of other *A.* (*Tetrasphaeropyx*) species.

Aleiodes (*Tetrasphaeropyx*) *crassijugosus*
Fortier 2007b: 5

Female.—**Body color**: head entirely yellow-orange except maxillary galeae, glossae, and labia brown, labial palps brown, antennae black, interocellar space black; remainder of body yellow-orange except antero-ventral edge of scutum black, propodeum black, metapleuron bicolored with black, metasomal tergite IV washed with black highlights, all tarsomeres with black; forewing stigma and all wing veins honey amber. **Body length**: 4.8 mm; Forewing length: 4.4 mm. **Head**: ocelli small, ocell-ocular distance 1.9 length of longest diameter of lateral ocellus; 43 flagellomeres, all distinctly longer than wide; malar space 1.2 width of mandibular base and 0.6 length of eye height; clypeus swollen, medial height 1.1 length of oral space medial height; oral space small, circular, horizontal diameter 0.75 width of mandibular base; occipital carina complete at vertex; face rugulose over minutely sculptured surface, a few transverse carinulae ventral to antennal scrobes. **Mesosoma**: pronotum steeply declivous antero-medially, transverse scrobiculate sulci laterally; mesoscutum coriaceous, notauli weakly scrobiculate, terminating at antero-lateral corners of postero-medial rugose area; mesopleuron with precoxal sulcus broadly, shallowly defined, coriaceous sculpturing, mesopleuron coriaceous around precoxal sulcus, rugocostate below subalar sulcus; propodeum areolate-rugulose, median carina complete. **Legs**: tarsal claws with length greater than 0.5 width of apical tarsomere apex, not pectinate apically, dorsal surface of metacoxae weakly rugulose-areolate over minutely sculptured surface. **Wings**: forewing with vein r 0.5 length of 3RSa, second submarginal cell elongate-trapezoidal, vein 1CUa 0.3 length of 1CUb; hind wing RS slightly sinuate, marginal cell narrowest in middle, vein 1r-m 0.6 length of 1M, 1M 0.6 length of M+CU, vein m+cu an unpigmented fold, 0.4 length of 1r-m. **Metasoma**: metasomal tergites I and II with bold, widely spaced costae; tergite III with finer, narrowly spaced costae; tergite IV rugulocostulate, tergite IV a shallow carapace over apical tergites, interior angle of curvature greater than 90°, ventral flange unpigmented, boldly scrobiculate.

Male.—similar to female except sculpturing of metasomal tergites I and II variable, usually rugocostate rather than costate, sculpturing of metasomal tergite IV usually rugocostate rather than rugulocostulate, coloration darker, usually black on scutum and metasomal tergites I, II, and/or III in contrast yellow-orange in female on those sclerites.

Holotype.—female: CANADA, ONTARIO, Stittsville, VI-9-1963, W. R. M. Mason. Deposited in CNC.

Paratypes.—5 males: same data as holotype female; male: CANADA, MANITOBA, VII/25/1951, K. D. Schwab. Deposited in CNC.

Biology.—host unknown.

Comments.—This species is similar to *A. illiniweki* found in east-central Illinois USA. It can be distinguished from that species by the black mesosomal venter, unlike the yellow-orange venter in the latter.

Etymology.—The specific name is from the Latin *crassus* for "stout" or "thick," and *carina* for ridge. The specific name refers to the thick carinae of metasomal tergite II of this species.

Aleiodes (*Tetrasphaeropyx*) *dabai* Fortier
new species

Female.—**Body color:** head, pronotum, mesoscutum, scutellum bright yellow-orange except antennae, ocellar triangle black, palps dark brown; propleuron bicolored with black; mesopleuron bicolored, extensively black ventrally; metathorax black; propodeum black; metasomal dorsum black, lined laterally with yellow-orange; all coxae yellow-orange, trochanters, trochantellae brown, femora bicolored, otherwise legs brown; wings hyaline, veins, stigma brown, tegula brown. **Body length:** 3.6 mm; fore wing length: 3.0 mm. **Head:** eyes and ocelli small, not covering most of head, ocell-ocular distance about 1.3 length of diameter of lateral ocellus, basal 7 flagellomeres only slightly longer than wide, width about 0.9 of length, malar space long, about 1.6 basal width of mandible and about 0.7 of eye height, occipital carina complete at vertex, clypeus weakly swollen, oral space small, circular, horizontal diameter about equal to mandibular basal width, face coriaceous. **Mesosoma:** pronotum bisected on each side by scrobiculate sulcus, pronotum shelf-like medially, with 2 prominent carinae ventro-laterally, costate dorso-laterally, mesoscutum foveolate-coriaceous, notauli weakly scrobiculate terminating posteriorly at lateral edges of posterior rugose area; mesopleuron with well-defined precoxal sulcus, vertical costulae in precoxal sulcus, central disc nitid posteriorly, lightly punctate-foveate anteriorly, propodeum heavily rugose, steeply declivous posteriorly, median carina incomplete posteriorly. **Legs:** tarsal claws not pectinate apically, hind coxae punctate dorsally over coriaceous surface. **Wings:** fore wing with vein r long, about 1.1 length of 3RSa and about 1.7 length of r-m, second submarginal cell short, rectangular, vein 1CUa about 0.4 length of 1Cub; hind wing with vein RS slightly sinuate, marginal cell narrowest in middle, vein 1r-m 0.75 length of vein 1M, vein 1M 0.47 length of M+CU, vein m-cu present as an unpigmented fold, 0.5 length of 1r-m. **Metasoma:** tergite I areolate-rugulose; tergite II rugose; tergite III rugulose; tergite VI rugulose, a complete carapace over apical tergites , ventral flange of carapace completely recurved apically.

Male.—unknown

Holotype.—female: USA: WYOMING, Carbon Co., 17 mi. E. of Rawlins, 1.5 mi. N of Hwy 80 at N. Platte R. mixed vegetation, Malaise VIII/6-21/1991, Mian Inayatullah, coll. Deposited in ESUW.

Biology.—host unknown.

Comments.—This species resembles the following species with contrasting bright yellow-orange head and mesosoma, black metasoma, and deep, complete carapace with internal angle of curvature less than 90º: *A. dorsofoveolatus A. hiisiis, A. kisomm*, and *A. citriscutum*. It differs from *A. dorsofoveolatus* and *A. citriscutum* in that 1) the mesopleural sculpturing is not heavily foveate anterior to the central disc as in the latter, and 2) the carapace sculpturing of *A. dabai* is irregularly rugose rather then smoothly areolate or foveate as in A. *dorsofoveolatus* and *A. citriscutum*, respectively. This species is closely similar to *A. hiisiis* and *A. kisomm*. It differs from *A. hiisiis* in having 1)entirely black propodeal coloration and black metapleural coloration, 2) presence of a raised median longitudinal ridge along the anterior mesoscutum, and 3) tergite I short and wide, apical width/length greater than 1.8. It can be distinguished from *A. kisomm* as follows: 1) its occipital carina meets the hypostomal carina ventrally, 2) having rugose-areolate mesopleural sculpturing anterior to the central disc and sparse punctation on the anterior portion of the central disc rather than heavily foveate sculpturing.

Etymology.—The specific name is from Shoshone and means “sun” referring to the bright yellow-orange head and mesoscutal coloration.

Aleiodes (*Tetrasphaeropyx*) *dakotensis*
Fortier 2007b: 6

Female.—**Body color:** head entirely yellow-orange except black interocellar area, antennae black, palps yellow-orange; mesosoma entirely yellow-orange; metasomal tergite I black medially, orange laterally;

tergites II to IV orange with irregular black speckling; legs yellow-orange; wing veins yellow basally, otherwise brown; stigmas bicolored yellow basally, brown apically. **Body length:** 5.3 mm. forewing: 3.9 mm. **Head:** flagellomeres all slightly longer than wide, width of 6th flagellomere from pedicel 0.8 length of flagellomere; malar space 1.3 length of mandibular basal width and 0.6 length of eye height; temple width wide, 0.9 length of eye width; occipital carina complete at vertex; ocelli small, ocell-ocular distance 1.7 length of longest diameter of lateral ocellus; oral space small, circular, horizontal diameter about equal to mandibular basal width; face coriaceous; vertex with strong transverse costae. **Mesosoma:** pronotum costate ventro-laterally, areolate-shiny dorso-laterally; mesoscutum faintly, shallowly rugulose over coriaceous surface, median longitudinal sculptured ridge running from near anterior base of median mesonotal lobe nearly to posterior rugose area, notauli ending posteriorly in rugose area, notauli scrobiculate anteriorly; scutellar disc rugose-areolate, carinae roughened with coriaceous sculpturing; mesopleuron heavily rugocostate anterior of central disc as well as ventral of the central disc including heavy dorso-ventrally running costae in well defined precoxal sulcus, costae underneath subalar sulcus running longitudinally, central disc foveolate anteriorly, nitid dorsally and posteriorly, area posterior to central disc foveolate over coriaceous sculpturing; propodeum rugose, median carina complete. **Legs:** metacoxae heavily rugose-areolate, tarsal claws small, without apical pectinatiion. **Wings:** forewing second submarginal cell rectangular, vein r 0.6 length of 3RSa, vein 1cu-a beyond 1M by a distance less than 1cu-a length, 1cu-a 1.6 length of 1CUa; hind wing with RS slightly recurved in middle, marginal cell narrowest in middle, vein r-m 0.6 length of 1M, 1M 0.6 length of M+CU, vein m-cu an unpigmented fold, 0.7 length of r-m. **Metasoma:** tergite I heavily rugose-areolate, tergite II widely rugocostate, tergite III more finely, densely rugulocostulate, tergite IV rugulose-areolate, a complete, rounded carapace over apical tergites, internal angle of curvature less than 90º, ventral flange completely recurved at tergite apex, flange similarly colored as tergite.

Male.—as in female except propodeum bicolored, black basally, yellow-orange apically, tergite I not black medially as in female, tergite II rugose, not rugocostate as in female, forewing 1cu-a beyond 1M by a distance greater than length of 1cu-a, thus 1cu-a length less than length of 1CUa, rather than greater as in female.

Holotype.—female: SOUTH DAKOTA, Fort Thompson, latitude: N44.10°, longitude: W99.40°, light trap, IX-1-1948, D.T. Murdock, coll. Deposited in NMNH.

Paratype.—male: NORTH DAKOTA, Leonard, latitude: N46.65º, longitude: W97.24º, VII-25-1937, R. H. Beamer, coll. Deposited in SNOW.

Biology.—host unknown.

Comments.—A species with yellow-orange head and mesosoma, bicolored metasoma and heavy rugocostate sculpturing on mesopleuron and metasomal tergites I and II. This is a derived *A.* (*Tetrasphaeropyx*) species that resembles *A. huberi* in having a complete, rounded carapace with an internal angle of curvature less than 90º, small ocelli, ocell-ocular distance less than or equal to 1.3 length of largest diameter of lateral ocellus, and similar mesoscutal sculpturing and sculpturing of metasomal tergites II, III, and IV to the latter. It may be distinguished from *A. huberi* by its much larger size (5.3 mm. body length vs. 4.0 mm in *A. huberi*), tergite I rugose rather than rugocostate in *A. huberi*, mesoscutum entirely yellow-orange in contrast to black or bicolored in *A. huberi*, and carapace ventral flange similarly colored apically as carapace, rather than without pigmentation apically in *A. huberi*.

Etymology.—The specific name refers to the type localities in the north-central region of the United States.

Aleiodes* (*Tetrasphaeropyx*) *dissiticarina

Fortier 2007b: 7

Female.—**Body color:** face yellow except black area on middle below antennae including clypeus and area

around it, face yellow-orange around eyes; vertex, temples, and genae black; scutum black, sometimes (50%) with yellow-orange spot at anteromedial corners of notauli; scutellar disc black; mesopleuron black or mostly black; propodeum black; metapleuron black; basal 1/2 – 3/4 of metasomal tergite I black, tergite yellow-orange apically; tergite II yellow-orange; tergites III and IV black; all coxae yellow-orange, legs yellow-orange except brown to black tarsi and metatibiae; wings hyaline, veins pale basally, light brown apically. **Body length:** 3.4-4.4 mm. forewing length: 2.9-3.7 mm. **Head:** 40-42 flagellomeres, all slightly longer than wide; malar space 0.9-1.5 width of mandibular base and about 0.3- 0.4 length of eye height; temple width about 0.5-0.6 length of eye width; occipital carina usually complete at vertex (60%), usually reaching hypostomal carina (70%); ocelli medium, ocell-ocular distance 0.8-1.1 length of longest diameter of lateral ocellus; oral space small, circular, horizontal diameter about equal to basal width of mandible; face coriaceous with weak transverse carinulation; vertex coriaceous with weak transverse carinulation. **Mesosoma:** pronotum coriaceous ventro-laterally, coriaceous, shiny sculpturing dorso-laterally; mesoscutum and scutellar disc coriaceous, notauli weakly scrobiculate, ending posteriorly in rugose area; mesopleuron coriaceous with subalar sulcus and area ventral to it with faint costulae, precoxal sulcus wide, shallowly concave; propodeum rugose -areolate, median carina complete. **Legs:** metacoxae rugulose-coriaceous dorsally, tarsal claws without apical pectination. **Wings:** forewing second submarginal cell short, vein r 0.7-1.0 length of 3RSa, second submarginal cell often nearly square, vein 1cu-a beyond 1M by a distance usually greater than (80%) or otherwise equal to (20%) length of 1cu-a; hind wing with vein RS slightly recurved in middle, marginal cell narrowest in middle, vein 1r-m about 0.6 length of 1M, vein 1M 0.6-0.7 length of M-CU, vein m-cu nontubular, present as a fold, length variable, 0.6-0.9 length of 1r-m. **Metasoma:** tergites I and II usually with wide, bold costae; tergites III and IV rugulose-areolate; tergite IV a shallow carapace over all apical tergites, internal angle of curvature greater than 90°.

Male.—Essentially as female except mesopleuron yellow-orange ventrally.

Holotype.—Female: CANADA, BC, Hope, host geometrid *Semothisa granitata* (Guenee)(Geometridae), emerged July 12, 1955. Deposited in CNC.

Paratypes.—CANADA, BC, female, Hope, host *S. granitata* (Geometridae), emerged February 2, 1951; female, CANADA, BC, mile 14 Dease L. Rd., host *S. sexmaculata* (Geometridae), emerged April 30, 1959; female, CANADA, BC, Courtenay, Forbidden Plateau Road, host *S. granitata*, emerged June 3, 1952; female, CANADA, BC, T.V.S., host *S. granitata*, emerged from host February 2, 1950; female, CANADA, BC, Lillooet, host unknown geometrid, collected from Douglas Fir (*Pseudotsuga douglassii*), emerged May 6, 1949, J. H. McLeod, coll.; female, CANADA, BC, Okeover Arm, host *S. granitata*,, emerged May 19, 1952; female, CANADA, BC, Okeover Arm, host *S. granitata*, emerged March 17, 1952; female, Snowball Creek, host *S. granitata*, emerged February 8, 1950; female, CANADA, BC, Ash R. Road, host *S. granitata*, emerged July 10, 1956; female, CANADA, BC, Frazer Canyon, host *S. granitata*, emerged March 12, 1951; female, CANADA, BC, Cascade, host *S. granitata*, emerged February 7, 1950; male, CANADA, BC, Coombs, host *S. granitata*, emerged March 11, 1952; female, CANADA, QUEBEC, Senneterre, host *S. granitata*, emerged March 25, 1938; female, CANADA, NEW BRUNSWICK, Bon Accord, host *Semiothisa dispuncta* Walker, emerged March 7, 1962. Paratypes deposited in CNC.

Distribution.—known only from type localities in British Columbia, New Brunswick, and Quebec.

Biology.—Reared from geometrids *Semiothisa granitata* (Guenee), *S. sexmaculata* (Packard), *S. dispuncta* Walker, and an unidentified geometrid.

Comments.—This species is closely similar to *Aleiodes anatariatus* except that the second submarginal cell of the forewing is short, with vein r greater than 0.7 length of 3RSa, usually greater than or equal to 0.8 length of 3RSa, and metasomal tergite III is finely rugulose-areolate. In contrast, the length of vein r is less than or equal to 0.7 length of 3RSa in *A. anatariatus*, and metasomal tergite III is rugocostate. Also unlike *A. anatariatus*, the vertex sculpturing is not rugose, coriaceous, sometimes with faint rugulo-costulation, and the occipital carina is sometimes incomplete (40%) at the vertex. This species is evidently widely distributed, widely collected in British Columbia, and also with one recorded location in southwestern Quebec Province and one in east-central New Brunswick. The known range of *A. anatariatus* extends from southern British

Columbia to southern Yukon Territory.

Etymology.—The specific name is from the Latin *dissitus*, meaning 'far' or 'apart,' and the Latin *carina*, meaning 'ridge' or 'keel.' The name refers to the widely separated carinae of metasomal tergite II.

Aleiodes (*Tetrasphaeropyx*) *dorsofoveolatus*

Fortier 2006b: 476-477

Female.— **Body color**: head orange, mandibles pale yellow, galeae black, ocellar triangle black near ocelli, orange medially, scapes, pedicels orange, annelli dark orange, flagella black, mesosoma orange except propodeum black; metasomal tergite I black except orange antero-lateral corners, postero-lateral corners, and along posterior margin, tergite II black with orange highlights, metasomal tergites III and IV black; front legs orange, tarsi missing, middle and hind legs orange except tibiae and tarsi brown, basal half of hind femora brown, wings hyaline, veins yellow basally otherwise dark brown except fore wing r-m and (RS+M)b lightly pigmented, stigma dark brown, hind wing veins light brown basally becoming darker apically except posterior 1/2 of cu-a, RS, and m+cu colorless. **Body length**: 4.0 mm, fore wing length: 3.1 mm. **Head**: malar space long, 1.4 width of mandibular base and 0.5 length of eye height; temple wide, width about 0.9 eye width; oral space nearly circular, small, horizontal diameter 0.9 of mandibular basal width; clypeus medial height about equal to medial height of oral space; occipital carina complete medially, not meeting hypostomal carina ventrally; flagellae broken apically so unable to determine flagellomere numbers, basal flagellae slightly longer than wide, width/length about 0.8; median ridge extending halfway down face from between antennae well defined; ocelli small, ocell-ocular distance about 1.3 length of longest diameter of lateral ocellus; face faintly rugulose over coriaceous surface, frons coriaceous; vertex rugulo-costate, transverse carinae on vertex, temples coriaceous with faint rugulation, occiput smooth, shining. **Mesosoma**: pronotum shiny-coriaceous, shelf-like antero-dorsally, each side with a scrobiculate lateral sulcus dividing lateral areas of pronotum into dorso-lateral and ventro-lateral sections, dorso-lateral sections lacunose, ventro-lateral sections areolate-rugulose; scutum lacunose except rugose posterior medial area, ridges of lacunae coriaceous, notauli unsculptured, terminating in rugose area; scutellar disc lacunose; mesopleuron areolate anterior of nitid central disc area, densely punctate posterior of central disc area, sternaular area concave, costate, costae running dorso-ventrally; metapleuron areolate; propodeum heavily areolate-rugose, lateral tubercles present, median carina weakly complete apically. **Legs**: tarsal claws with basal pectination only, hind coxae foveolate. **Wings**: hyaline, second submarginal cell elongate, r about 0.8 length of 3RSa and about equal to m-cu; 1cu-a beyond M by a distance slightly greater than length of 1cu-a, 1CU-a long, about 0.4 of 1CU-b; hindwing RS slightly recurved, marginal cell narrowed medially, M about 1.6 of 1r-m, M+CU about 1.5 of 1M, m+cu about 0.6 of 1r-m and unpigmented. **Metasoma**: tergites I, II, and III foveolate, appearing areolate in some specimens under some lighting conditions, median carinae complete in first 2, tergite IV foveolate, rounded, deeply carapace-like, completely covering tergites apical to it, internal angle of curvature less than 90°, ventral flange pale yellow, scrobiculate, well defined, recurved along entirety; ovipositor length 0.6 of length of hind basitarsus

Male.—essentially as in female.

Holotype — female: NEW MEXICO, Eddy Co., 26 miles east of Carlsbad, V/28/1977, Malaise Trap (West). Deposited in TAMU

Paratypes.—2 males: same location data as holotype. V/31/1977 and VI/2/1977. Deposited in TAMU.

Biology.— unknown

Comments.— This species falls within a group of apparently similar species consisting of *A. citriscutum*, *A. dabai*, *A. hiisiis*, and *A. kisomm*, all of which have a combination of bright yellow-orange head and mesosomal coloration contrasting with black metasomal color, and extensive smooth-areolate or foveate sculpturing on the metasomal dorsum. The sculpturing of tergite II of this species is transitional between the two above-described character states. Females may be distinguished from *A. dabai*, *A. hiisiis*, *and A. kisomm*

by the smooth-areolate sculpturing of tergite II, in contrast to the more irregular rugose sculpturing of the latter. It may be distinguished from *A. citriscutum*, a closely related species, by its orange mesopleural venter, in contrast to black in the latter species.

Etymology.— name refers to the sculpturing pattern of the mesoscutum, mesopleuron, metasomal tergite IV.

Aleiodes (*Tetrasphaeropyx*) *exiguus* Fortier new species

Female.—**Body color:** head entirely yellow-orange except for black ocellar triangle, antennae brown, palps yellow; pronotum and prosternum yellow-orange; medial lobe of mesoscutum yellow-orange, lateral lobes bicolored wth black; scutellar disc yellow-orange; mesopleuron and metapleuron yellow-orange; propodeum black with yellow highlights apically; metasomal tergite I black washed with yellow; tergites II-IV yellow washed with black; fore legs yellow; middle and hind legs yellow except apices of femora brown, tibiae and tarsi entirely brown; forewing vein C+SC+R and stigma brown, other veins pale basally becoming brown apically; hind wing veins pale except 1r-m and R1 brown. **Body length:** 3.0 mm; fore wing length 2.5 mm. **Head:** ocelli large, ocell-ocular distance 0.8 length of longest diameter of lateral ocellus; 35 flagellomeres, all distinctly longer than wide; malar space short, equal to width of mandibular base and 0.3 length of eye height; clypeus swollen, medial height equal to oral space medial height; oral space small, circular, horizontal diameter 0.9 width of mandibular base; occipital carina incomplete at vertex; face coriaceous. **Mesosoma:** pronotum shelf-like medially, each side with a transverse scrobiculate sulcus medially separating each side into a dorso-lateral and ventro-lateral section; mesoscutum coriaceous, notauli weakly scrobiculate, terminating at antero-lateral corners of postero-medial rugose area; mesopleuron with precoxal sulcus broadly, shallowly defined, mesopleuron minutely sculptured ventrally becoming sparsely punctate mid-laterally and rugose dorsally beneath subalar sulcus; propodeum finely rugose-areolate, carinae ridged with apparently coriaceous microsculpturing, median carina complete. **Legs:** hind coxae with faint, sparse carinulation, length of hind tarsal claws greater than1/2 with of apical tarsomere. **Wings:** forewing vein r 0.6 length of 3RSa, second submarginal cell elongate-trapezoidal, vein 1CUa 0.3 length of 1CUb; hind wing vein RS slightly sinuate, thus marginal cell narrowest in the middle, 1r-m 0.6 length of 1M, 1M 0.6 length of M+CU, vein m+cu an unpigmented fold, 0.4 length of 1r-m. **Metasoma:** tergites 1-IV finely rugulose-areolate; tergite IV a carapace over apical tergites, interior angle of curvature 90°, ventral flange unpigmented, weakly recurved apically.

Male.—unknown

Holotype.—female: USA: TEXAS, Presidio Co., Big Bend Ranch SNA, Ojito Adentro, V-14-1990, R. Wharton. Deposited in TAMU

Biology.—host unknown.

Comments.—This species is similar to *A. chisosi*. It can be distinguished from that species by 1) the finely rugulose-areolate sculpturing of tergites II and III in contrast to the rugocostate sculpturing of those tergites in *A. chisosi*, 2) its smaller body length (3.0mm) in contrast to body length of 3.7 mm. in *A. chisosi*, and 3) palps yellow, rather than brown, as in *A. chisosi*.

Etymology.—The specific name is from the Latin, *exiguus*, meaning small, and refers to the diminutive size of the holotype specimen.

Aleiodes (Tetrasphaeropyx) fernaldellavorax
Fortier 2006b: 477-478

Female.—**Body color**: head yellow-orange except black antennae and interocellar area, palps brown;

mesosoma yellow-orange except propodeum with black basally; metasomal tergites yellow to yellow-orange; legs brown; wings infumate, wing veins, stigma bicolored. **Body length:** 4.25 mm; forewing length 3.8 mm. **Head:** ocelli small, ocell-ocular distance about 1.25 length of longest diameter of lateral ocellus; 41 flagellomeres, flagellomeres distinctly longer than wide; malar space long, about 1.4 length of mandibular base-length and about 0.5 length of eye height; occipital carina complete at vertex, reaching hypostomal carina ventrally, sometimes weakly so; clypeus short, oral space medial height 1.4 length of clypeal medial height; face shiny-foveolate; frons nitid; vertex shiny-foveolate. **Mesosoma**: pronotum with medium longitudinal carina which meets posterior transverse carina, lateral scrobiculate grooves originating on either side of median carina dividing lateral pronotum into antero-lateral and postero-lateral regions, pronotum shiny areolate-foveate ventro-laterally, shiny foveate dorso-laterally; mesoscutum shiny areolate-foveate, notauli scrobiculate; scutellar disc foveolate; mesopleuron foveolate, precoxal sulcus concave, carinulate; propodeum foveolate, median carina discontinuous, absent in its midsection, present anterior to steep posterior declivity, present apically at bottom of declivity. **Legs**: tarsal claws almost reaching tarsal apex, well developed, with basal teeth only; hind coxae foveolate. **Wings**: forewing with vein r long, only slightly less than length of 3RSa, 0.3 length of 3RSb, thus 3RSa short, second submarginal cell short, sometimes square, vein r length about equal to r-m, about 0.8 of m-cu, vein 1cu-a beyond 1M by a distance slightly less than or equal to length of 1cu-a, vein 1cu-a length about 0.33 of 1CUb; hind wing vein RS slightly recurved, marginal cell narrowest in middle, vein 1r-m about 0.75 of 1M, 1M about 0.55 of M+CU, m+cu sometimes absent, often present, pigmented, with length half or greater than 1r-m. **Metasoma**: tergite I foveate, medium carina not complete apically, tergite short, apical width about 1.5 of tergite length; tergites II and III areolate-foveate, base of median carina of tergite II with a small, raised, nitid triangular area, median carina complete apically; median carina of tergite III sometimes not present, when present, incomplete apically; groove between tergites II and III deep and scrobiculate; tergite IV foveate, a deep, complete carapace over apical tergites, ventral flange entire and similar in color to rest of tergite.

Male.—Essentially as in female except some basal flagellomeres about as long as wide, width/length greater than or equal to 0.8, and metasomal tergite I often with black.

Holotype.— female, USA: TEXAS, Bell Co., Hwy. 36, 6 mi. NW Temple, host: *Fernaldella fimetaria*; plants swept or vacuumed: *Xanthocephalum texanum* and *X. dracunculoides* September 6, 1978. R. Psencik and T. Robbins colls. Deposited in NMNH.

Paratypes.— Female: USA: COLORADO, Weld Co., Pawnee Grassland, IV/6 – VII/23 1966, J. Przybyszewski, coll. Deposited in NMNH. All of the following with the following locality, host, and host plant information: USA: TEXAS, Bell Co., Hwy. 36, 6 mi. NW Temple, host: *Fernaldella fimetaria*; plants swept or vacuumed: *Xanthocephalum texanum* and *X. dracunculoides*. male, USA:TEXAS, VI/23/1978, R. Psencik coll. Deposited in NMNH. male, VIII/29/1978, R. Psencik & T. Robbins, colls., deposited in NMNH. male, VII/21/1978, Robbins, coll. Deposited in NMNH. male, VII/8/1977, R. Psencik, deposited in NMNH.

Distribution.—Known only from type localities in Colorado and Texas.

Biology.—Reared from geometrid *Fernaldella fimetaria* Wright, collected from *Xanthocephalum dracunculoides* (DC.) Shinners and *X. texanum* (DC.) Shinners.

Comments.—This species is similar to *A. pilosus* (Cresson) but is easily distinguished by the dark propodeum. In *A. pilosus*, the propodeum is yellow-orange or orange.

Etymology.—The specific name refers to the genus name of the known geometrid host, *Fernaldella*, and the Latin *vorax*, meaning devourer.

Aleiodes* (*Tetrasphaeropyx*) *flavinotaulus

Fortier 2006b: 478-479

Female.—*Body color*: head yellow-orange except inter-ocellar area, antennae, and mouthparts posterior to mandibles black; pronotum mostly yellow-orange; mesoscutum bicolored, yellow-orange anterolaterally, and

notauli yellow orange, otherwise scutum black; scutellar disc yellow rimmed with black; mesopleuron bicolored; propodeum, metasoma black, legs yellow-orange except all tarsi and hind coxae with black, wings with dark brown veins, stigmas. Body length: about 4.5 mm. *forewing length* about 3.5 mm. Head: ocelli small, ocellocular distance 1.1-1.2 of longest lateral ocellar diameter; 38 flagellomeres, all distinctly longer than wide, eighth flagellar length about 1.4 of width; malar space long, about 1.8 of mandibular baselength and about 0.5 of eye height; occipital carina complete at vertex, not reaching hypostomal carina ventrally; oral space small, circular, medial height slightly larger than medial clypeal height, about 1.1 of clypeal height; face areolate with coarse white setae; frons coriaceous; vertex coriaceous with sparse punctations and faint transverse carinulae. Mesosoma: pronotum with transverse scrobiculate sulci laterally, shiny-foveate dorso-laterally, rugose ventro-laterally; mesoscutum shiny-foveate over faintly coriaceous surface sculpturing, notauli without scrobiculation, becoming foveate as they broaden posteriorly and become confluent with posteromedial rugose-foveate area; scutellar disc shiny-foveate; mesopleuron heavily foveate except central disc nitid, precoxal sulcus a deep, wide, longitudinally running groove with dorsoventrally running costae; propodeum foveate-areolate with a steep declivity posteriorly, median carina complete. Legs: tarsal claws large, easily visible, with teeth basally only; hind coxae shiny-areolate. Wings: forewing with vein r long and second submarginal cell small, square, vein r about 1.4 length of 3RSa, 0.4 length of 3RSb, 1.7 length of m-cu, and 1.8 length of r-m, vein 1cu-a beyond 1M by a distance of about 1.3 of length of 1cu-a and about 0.3 of 1CUb; hind wing with vein RS nearly straight, marginal cell gradually widening apically, vein 1r-m about 0.75 of 1M, 1M about 0.5 of M+CU, thus 1M relatively short, vein m+cu a non-tubular, unpigmented fold about 0.8 of 1r-m length. Metasoma: tergites I and II foveolate over nitid surface; tergites III and IV punctate over nitid surface; tergite I short and wide, apical width about 1.9 of tergite length, median carina of tergite I weakly complete apically; median carina of tergite II weak, incomplete apically; median carina of tergite III present as an undifferentiated raised ridge in basal half of tergite; groove between tergites II and III scrobiculate; tergite IV a deep, complete carapace over tergites apical to it, internal angle of curvature less than 90º, with ventral flange entire, recurved, lightly pigmented.

Male.—Essentially as in female except genae black ventrally, basal 10 flagellomeres nearly as wide as long, width/length greater than or equal to 0.8, eighth flagellomere width about equal to length, scutellum black.

Holotype.—Female: USA: CALIFORNIA, 12.5 mi. E. of [illegible], *ex.: Larrea divaricata* (Creosote bush), 1952, Timberlake collection. Deposited in NMNH.

Paratype.—Male: USA: CALIFORNIA, Boraga [sp?], April 24, 1953, *ex.: Larrea divaricata* Timberlake collection. Deposited in NMNH.

Distribution.—Known only from type locality in California.

Biology.—collected from *Larrea divaricata*..

Comments.—This species falls within a species-cluster which can be distinguished by the following unique combination of characters: 1) heavy foveolate sculpturing on the mesoscutum, scutellum, and metasoma; 2) deep, rounded metasomal tergite IV with internal angle of curvature less than 90º, and 3) forewing vein r length greater than or equal to 0.8 length of 3RSa. Within this cluster, it closely resembles *A. brevicellula* and *A. cochisensis* with which it shares the following unique combination of characters: 1) forewing vein r length greater than 1.3 length of 3RSa and second submarginal cell small and square. It can be distinguished from *A. brevicellula* and *A. cochisensis* by the following: 1) mesoscutum extensively black with yellow-orange notauli, in contrast to black without yellow-orange notauli in the latter; 2) vertex shiny-punctate, in contrast to transversely strigulate in the latter.

Etymology.—The specific name refers to the yellow notauli contrasting with the black mesoscutal lobes.

Aleiodes* (*Tetrasphaeropyx*) *haematoxyloni
Fortier 2007a: 21–23

Female.—Body color: Body yellow-orange except black ocellar triangle, brown antennal pedicel and flagellomeres, pronotum, propodeum, and metasomal tergites I–III yellow, tergite IV darker, yellow-brown, legs yellow except apical halves of hind tibiae brown and hind tarsi brown, wings hyaline, stigma light brown in basal quarter, otherwise dark brown, forewing C+SC+R, M+CU, 1A yellow basally becoming brown apically, other apical veins brown except (RS+M)b and r-m colorless; hind wing veins yellow to light brown except slightly darker R1. **Body length:** 4.4 mm, forewing length 3.9 mm. **Head:** 41 flagellomeres, all longer than wide, large eyes, temple width 0.3 of eye width, malar space short, 0.7 of mandibular basal width and 0.2 length of eye height, occipital carina incomplete at vertex, not reaching hypostomal carina; oral space small, circular, width about 0.8 of basal width of mandible; clypeus broad, flattened, protruding slightly from face, height about equal to height of oral opening; ocelli large, almost touching eyes, ocellocular distance about 0.2 of ocellar diameter; face coriaceous with dorsal punctation; frons coriaceous; vertex coriaceous, punctate posteriorly, temples with sparse punctation over coriaceous surface. **Mesosoma:** pronotum shelflike, rugulose anteriorly with scrobiculate ventral flange upturned anteriorly becoming smooth antero-laterally, pronotum finely rugulose ventro-laterally; and areolate-rugulose dorso-laterally, dorsolateral and ventrolateral areas separated by scrobiculate lateral sulcus on each side; scutum, scutum coriaceous, scrobiculation in notaular grooves faint, notauli extending posteriorly, lateral to rugulose dorso-posterior area, terminating just anterior to pre-scutellar carina; scutellar disc finely areolate-rugulose; mesopleuron smooth-punctate anterior and posterior to central disc, central disc nitid posteriorly, sternaular area slightly concave, shallowly rugulose centrally, shallowly costate posteriorly; propodeum rugulose, median carina complete; metapleuron finely areolate. **Legs:** basal pectination only, tarsal claws small, arolium longer than claws, inner spurs of hind tarsi 0.3 length of hind basitarsus, hind coxae coriaceous. **Wings:** forewings with vein r short, 0.6 length of 3Rsa and 0.9 length of m-cu, vein 1cu-a beyond 1M by distance equal to 1cu-a, 1CUa about 0.3 length of 1Cub; hind wing with marginal vein slightly recurved, marginal cell narrowest in middle, 1M about 1.4 length of r-m, M+CU about 1.5 length of 1M, vein m-cu present, pigmented, about 0.5 length of 1r-m, immediately posterior to 1r-m. **Metasoma:** tergite I rugulocostulate, median carina complete, terminating on raised posteromedial area at short carina along posteromedial edge of tergite; tergite II rugulocostulate, median carina originating from a small basal raised triangular area, complete apically; tergite III rugulocostulate, median carina incomplete, terminating just basad of apical flange; tergite IV finely areolate-rugulose, shallowly carapace-like, interior angle of curvature greater than 90°, ventral flange well demarcated, scrobiculate, colorless laterally becoming yellow apically; ovipositor about 0.6 length of hind basitarsus.

Male.—unknown.

Holotype.— female: MEXICO: OAXACA, 2km W. Guellaguichi, July 13, 1990, P. G. daSilva and T. eager, deposited TAMU.

Paratype.— female: MEXICO: OAXACA, 5 mi. W. Tequisistlan, 1100 ft., August 23, 1973, A. Newton, coll. blacklight. deposited in TAMU.

Distribution.—known only from type locality in Oaxaca, Mexico.

Biology.—reared from geometrid host (D. Adamski, personal communication) associated with *Haematoxylon brasiletto* Karsten.

Comments.— A nearly all-yellow wasp with large ocelli and eyes, and fine sculpturing, similar to *Aleiodes quickei* Fortier. Can be distinguished by the following: 1) body color pallid yellow, in contrast to brighter color tone in the latter; 2) antennal pedicel dark, in contrast to yellow in *A. quickei*; 2) forewing stigma mostly dark brown, in contrast to mostly yellow in *A. quickei*, and 4) hind tibiae dark brown apically, in contrast to yellow in *A. quickei*.

Etymology.—Named after the legume tree genus *Haematoxylon* utilized by geometrid host. *Haematoxylon braziletto* is a neotropical tree sometimes harvested for its bright orange-red wood. An extract from this species has been demonstrated to inhibit growth of enterohemorrhagic *Escherichia coli* (N. Heredia

et al. 2005)

Etymology.—The specific name refers to the host plant of the geometrid host of this species.

Aleiodes (*Tetrasphaeropyx*) *halifaxensis*
Fortier 2007a: 23–24

Female.—**Body color**: face yellow-orange except faint brown spot immediately above clypeus; tips of mandibles reddish brown; frons brown medially, yellow-orange laterally; inter-ocellar area black; vertex yellow-orange except broad brown stripe running from between posterior margins of lateral ocelli to occipital carina; temples brown; genae yellow-orange; occiput yellow-orange dorsally, brown laterally, and yellow-orange ventrally such that color pattern is continuous with that of vertex, temples, and genae; pronotum yellow-orange; propleuron brown; scutum black except yellow-orange spot at anteromedial corners of notauli; scutellar disc black; propodeum black; mesopleuron, metapleura black, metasomal dorsum brown except yellow-tan basomedial area; coxae, trochanters, trochantelli, femora of all legs yellow-orange, tibiae of forelegs yellow-orange, tibiae of middle and hind legs brown, tarsi of all legs brown; wings hyaline, all veins yellow basally becoming darker brown apically except forewing veins (RS+M)b and r-m colorless, hind-wing RS not tubular and colorless, posterior portion of cu-a colorless. **Body length:** 4 mm; forewing length: 3.2 mm. **Head:** 40 flagellomeres, all distinctly longer than wide; malar space long, 2.0 width of mandibular base and 0.4 length of eye height; temple broad, 0.6 of eye width; occipital carina effaced medially at vertex, meeting hypostomal carina; oral space small, horizontal width 0.8 length of basal width of mandible; clypeus broad, flattened, medial height about 1.3 length of medial height of oral opening; ocelli small, ocellocular distance about 1.3 length of diameter of lateral ocellus; face, frons, vertex coriaceous; temples coriaceous. **Mesosoma:** anterior half of ventral edge of pronotum with scrobiculate flange, pronotum coriaceous antero-medially, on each side a transverse sulcus divides pronotum into ventro-lateral and dorso-lateral areas, sulci scrobiculate for a short distance, lateral portions of sulci unsculptured, dorso-lateral areas smooth with 3 or 4 shallow carinae, ventro-lateral areas coriaceous; scutum coriaceous except notauli scrobiculate, median posterior area obliterated by pin; scutellar disc coriaceous; mesopleuron coriaceous except posterior half of central disc nitid, subalar sulcus shallowly rugulose becoming scrobiculate anteriorly, mesopleuron finely costulate ventral to sulcus, sternaular area weakly concave; propodeum areolate-rugose, median carina complete. **Legs:** tarsal claws small, pectinate basally only, arolium longer than claw, inner spurs of hind tibiae about 0.4 length of hind basitarsus; hind coxae coriaceous dorsally. **Wings:** front wing with vein r about 0.6 length of 3RSa and about 0.8 of length of m-cu, vein 1cu-a beyond 1M by distance of 1.5 of length of 1cu-a, 1CUa about 0.3 length of 1Cub; hind wing with marginal vein not tubular, slightly recurved, marginal cell narrowest in middle, 1M 2.0 length of r-m, vein m-cu present, unpigmented, about 0.8 length of r-m and immediately posterior to it, adjoining it. **Metasoma:** tergite I areolate-rugose, median carina complete; tergite II rugocostate in basal 3/4, areolate-rugose in apical 1/4, median carina originating basally from a small triangular raised area and complete apically; tergite III entirely finely areolate-rugulose, median carina neither complete to basal nor apical tergite margin; tergite IV with sculpturing similar to tergite III, completely covering remaining tergites, shallowly carapace-like, internal angle of curvature greater than 90°, ventral flange not recurved; ovipositor about 0.6 of length of hind basitarsus.

Male.—unknown.

Holotype female.—NOVA SCOTIA, Halifax, emerged 16-III-1949. Deposited in CNC.

Distribution.—Known only from type locality in Nova Scotia.

Biology.—Reared from geometrid *Semiothisa granitata*.

Comments.—A dark, relatively smoothly sculptured species with extensive coriaceous sculpturing on the head, scutum, and mesopleuron, and a flat carapace. Is easily distinguishable from other species with similar sculpturing by entirely black metasoma, and from other species with entirely black metasomas by the combination of extensive coriaceous sculpturing on vertex and mesosoma, and extensive yellow on head.

Etymology.—Named after type locality of Halifax, Nova Scotia.

Aleiodes (*Tetrasphaeropyx*) *hiisiis* Fortier new species

Female.—**Body color:** head, thorax entirely light yellow-orange except black antennae and ocellar triangle, dark brown palpi; propodeum bicolored, black anteriorly, yellow-orange posteriorly; metasoma bicolored, tergite I mostly black, yellow-orange laterally; tergite II mostly orange, washed with black medially; tergite III and IV mostly black; legs entirely orange, tarsi darker; wings hyaline, veins, stigma dark brown. **Body length:** 3.75 mm; Fore wing length: 3.0 mm. **Head:** eyes and ocelli small, not covering most of head, ocell-ocular distance about 1.25 length of longest diameter of lateral ocellus; flagellomeres all distinctly longer than wide; malar space long, mandible small, malar space 2.0 length of basal width of mandible and 0.5 length of eye height; occipital carina complete at vertex; clypeus weakly swollen; oral space small, circular, horizontal diameter equal to basal width of mandible; face coriaceous. **Mesosoma:** pronotum transversely bisected by scrobiculate sulcus, pronotum shelf-like medially, costate in antero-lateral corners, rugocostate postero-laterally; mesoscutum weakly foveolate over coriaceous surface, notauli weakly scrobiculate terminating posteriorly at lateral edges of posterior rugocostate area; mesopleuron with well-defined precoxal sulcus, well defined costae in precoxal sulcus, mesopleuron coarsely foveolate anteriorly; metapleuron coarsely foveate; propodeum rugose, steeply declivous posteriorly, median carina complete. **Legs:** tarsal claws not pectinate apically, hind coxae foveolate dorsally. **Wings:** fore wing with vein r long, about 0.9 length of 3RSa, second submarginal cell short, rectangular, almost square, vein 1CUa short, 0.25 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest at middle, vein 1r-m 0.7 length of 1M, vein 1M less than 0.55 length of M+CU, vein m-cu an unpigmented fold, 0.55 length of 1rm. **Metasoma:** tergite I rugose-areolate with a few longitudinal costae, tergite II rugocostate, tergite III rugulocostulate, tergite IV rugulose-areolate, a complete carapace over apical tergites, ventral flange of carapace completely recurved apically.

Male.—unknown.

Holotype.—female: IDAHO: Craters of the Moon National Monument, VIII-10-1965, D.S. Horning, Jr., coll. Deposited in NMNH.

Biology.—host unknown.

Comments.—This species falls within a group of similarly colored species with deep, well developed carapaces and small ocelli that are found in the western and southwestern Nearctic north of Mexico. The group also includes *A. citriscutum*, *A. dorsofoveolatus*, *A. kisomm*, and *A. dabai*. This species can be separated from *A. kisomm* by its more coarsely foveate mesosomal and metasomal sculpturing, and from *A. kisomm* and *A. dabai* by its yellow-orange mesopleural venter and metapleuron in contrast to black coloration in those 2 species. Additionally it can be separated from *A. dabai* by its foveate mesopleural and metapleural sculpturing in contrast to rugose sculpturing in the latter. It may be separated from *A. dorsofoveolatus* by metasomal tergite II rugocostate rather than areolate as in the latter, and tergite IV rugulose-areolate in contrast to foveolate in the latter.

Etymology.—The specific name is from the Arapaho and means “sun,” referring to the bright yellow-orange head and thoracic coloration.

Aleiodes (*Tetrasphaeropyx*) *huberi*
Fortier 2007b: 8-9

Female.—**Body color:** head yellow-orange except black inter-ocellar area, antennae black; mesosoma yellow-orange except median mesonotal lobe mostly blackish-brown, lateral mesonotal lobes borwn posteriorly; scutellum except scutellar disc brown; metanotum and propodeum bicolored; mesopleuron venter

black; metasomal tergites I and II yellow-brown; tergites III and IV darker brown than tergites I and II; coxae, trochanters yellow-orange, profemora yellow-orange, protibiae, tarsi brown, other leg segments missing; wings hyaline, veins, stigma yellow-brown. **Body length:** 4.0 mm. Forewing length: 3.0 mm. **Head:** flagellomeres all distinctly longer than wide; malar space long, 1.7 length of mandibular basal width and 0.5 length of eye height; temple wide, width 0.7 of eye width; occipital carina not complete at vertex; ocelli small, ocell-ocular distance 1.25 length of longest diameter of lateral ocellus; oral space small, circular, horizontal diameter equal to mandibular basal width; face coriaceous, vertex transversely rugocostate, more strongly costate medially, rugose laterally. **Mesosoma:** pronotum rugose-areolate ventro-laterally, rugose-areolate-shiny dorso-laterally; mesoscutum coriaceous underneath a larger, shallow areolate pattern, notauli scrobiculate in posterior 2/3 immediately anterior to posterior rugose area; scutellar disc rugose-areolate over a coriaceous surface; mesopleuron foveolate, precoxal sulcus clearly defined, with prominent dorso-ventrally running carinae; propodeum rugose-areolate, abrupt posterior declivity, median carina complete. **Legs:** metacoxae heavily rugose-areolate dorsally, tarsal claws without dorsal pectination. **Wings:** forewing second submarginal cell nearly square, vein r long, equal to length of 3RSa, vein 1cu-a beyond 1M by distance 1.6 length of 1cu-a; hind wing with vein RS slightly recurved in middle, marginal cell narrowest in middle, vein 1r-m 0.7 length of 1M, 1M 0.8 length of M+CU, vein m-cu pigmented, non-tubular, 0.7 length of 1r-m. **Metasoma:** tergites I and II rugocostate with thick, shiny carinae, tergite III rugocostate, costae shiny, well defined, less robust than in tergites I and II; tergite IV foveolate over a coriaceous surface, a deep, rounded carapace over all apical tergites, internal angle of curvature less than 90°, ventral flange well differentiated apically from tergite, nearly unpigmented and strongly recurved outward.

Male.—similar to female except metapleuron and propodeum entirely black rather than bicolored as in female, metacoxae with black highlighting rather than entirely yellow-orange as in female; leg parts missing in female yellow-orange except brown mesotibiae, metatibiae, and all tarsi brown; larger ocelli than in female, ocell-ocular distance equal to longest diameter of lateral ocellus; mesoscutum with deeper sculpturing than in female, appearing foveolate rather than areolate as in female; forewing second submarginal cell longer than in female, vein r 0.9 of 3RSa rather than equal to 3RSa as in female.

Holotype.—female: ONTARIO, Ottawa, Bells' Corners [Nepean], latitude N 45° 20', W 75° 46', host *Eupithecia gibsonata* Taylor (Geometridae), emerged March 10, 1944. Deposited in CNC.

Paratype.—male: QUEBEC, Luceville, latitude 48.5989, longitude –68.5167, host *Eupithecia* sp., emerged March 11, 1940. Deposited in CNC.

Biology.—Reared from geometrids in genus *Eupithecia* Curtis, including *Eupithecia gibsonata* Taylor.

Comments.—This is a derived *A.* (*Tetrasphaeropyx*) species with the following characteristics, which are derived within the species-group: extensive foveolate sculpturing, metasomal tergite IV a rounded carapace with internal angle of curvature less than 90°, and forewing with vein r greater than or equal to 0.9 length of 3RSa. This species resembles *A. dakotensis* in having a carapace with an internal angle of curvature less than 90°, small ocelli, ocell-ocular distance less than or equal to 1.3 length of largest diameter of lateral ocellus, and similar mesoscutal sculpturing and sculpturing of metasomal tergites II, III, and IV to the latter. It may be distinguished from *A. dakotensis* by its much smaller size (4.0 mm. body length vs. 5.3 mm in *A. dakotensis*), tergite I rugocostate rather than heavily rugose as in *A. dakotensis*, mesoscutum black (male) or bicolored (female) in contrast to entirely yellow in *A. dakotensis*, and carapace ventral flange without pigmentation apically, in contrast to similarly colored apically as carapace in *A. dakotensis*.

Etymology.—The specific name is after John Huber, a pre-eminent Canadian systematist of the hymenopteran family Mymaridae (Chalcidoidea).

Aleiodes (*Tetrasphaeropyx*) *illiniweki* Fortier new species

Female.—**Body color:** entirely yellow-orange except black inter-ocellar space and antennae, and black on

propodeum, sometimes on metasomal tergite I; legs yellow-orange except brown tarsi; wings hyaline, fore-wing costal vein (C+SC+R) and basal half of stigma yellow, apical half of stigma and other fore wing veins brown, hind wing veins honey yellow. **Body length**: 5 mm; fore wing length 3.8 mm. **Head:** ocelli small, ocell-ocular distance 1.5-1.6 length of largest diameter of lateral ocellus; 43 flagellomeres, all distinctly longer than wide; malar space long, 1.6 width of mandibular base and 0.5 length of eye height; clypeus weakly swollen, medial height 1.25 medial height of oral space, oral space small, circular, horizontal diameter equal to mandibular basal width; occipital carina complete at vertex; face coriaceous, several transverse carinae below antennal scrobes. **Mesosoma**: pronotum transversely bisected by scrobiculate sulcus, pronotum shelf-like medially, rugose-areolate ventro-laterally, shiny-rugulose dorso-laterally; mesoscutum weakly punctate over a coriaceous surface, notauli weakly, sparsely scrobiculate, terminating at lateral edges of depressed postero-medial rugose area; mesopleuron with broad, well defined precoxal sulcus, precoxal sulcus coriaceous and costulate, mesopleuron sparsely foveolate anterior to shiny central disc; propodeum rugocostate, with well-defined, posteriorly protruding lateral tubercles, propodeum steeply declivous posteriorly, median carina complete posteriorly. **Legs:** tarsal claws very small, length less than apical tarsomere width, not pectinate apically, dorsal surfaces of hind coxae with irregular shallow indentations. **Wings:** forewing with vein r 0.6-0.65 length of 3RSa, second submarginal cell elongate, vein 1CUa 0.3-0.35 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest in middle, vein 1r-m 0.6 length of 1M, 1M 0.6 length of M+CU, vein m+cu 0.6 length of 1r-m, faintly pigmented. **Metasoma:** metasomal tergites I and II heavily costate, deep sulci between costae; tergite III heavily rugocostate; tergite IV heavily rugose and a complete carapace over apical tergites, ventral flange complete apically, but only slightly recurved apically.

Male.—Essentially as in female except with black on metapleuron and flagellomeres shorter, basal 10 flagellomeres with width 0.9 length of flagellomere length; 44-45 flagellomeres in contrast to 43 in female.

Holotype.—female: USA: ILLINOIS, Champaign, M. Shackleford, coll. [no date] Deposited in NMNH.

Paratype.—1 female and 3 males: same data as holotype. Deposited in NMNH.

Biology.—host unknown.

Comments.—This species is unique in its combination of nearly all-yellow coloration, heavily, deeply costate metasomal tergites I and II, and tergite IV a complete carapace over apical tergites.

Etymology.—The specific name refers to the Illiniwek people whose homeland was the state of Illinois before they were driven to Oklahoma, and also refers to the collection location of the type specimens, in Illinois.

Aleiodes (*Tetrasphaeropyx*) *iowensis* Fortier new species

Female.—**Body color:** entirely yellow except inter-ocellar space black, flagella black, basal half of propodeum black (50%), hind tarsi brown, pterostigma, wing veins honey yellow-light brown. **Body length:** 4.2 mm. forewing length: 3.2-3.5 mm. **Head:** ocelli small, ocell-ocular distance 1.4-1.9 length of longest diameter of lateral ocellus; all flagellomeres in basal half of flagellum distinctly longer than wide; malar space long, 1.3-1.7 length of mandibular base and 0.6-0.7 length of eye height, clypeus medial height 0.8-1.0 length of oral space height, oral space small, circular, horizontal diameter 0.7-0.9 length of mandibular basal width; occipital carina complete at vertex; face coriaceous, transverse strigulation ventral of antennal sockets. **Mesosoma:** protnotum shelf-like anteriorly, each side transversely bisected by scrobiculate sulcus, pronotum coriaceous-areolate dorso-laterally, mesoscutum coriaceous-punctate, notauli entirely scrobiculate or scrobiculate basally and apically only, terminating along lateral edges of postero-medial rugose area; mesopleuron with well demarcated precoxal sulcus, precoxal sulcus coriaceous, mesopleural lobe dorso-posterior of precoxal sulcus foveolate-punctate, mesopleuron extensively punctate anterior to nitid central disc; propodeum areolate-rugose, postero-lateral tubercles prominent, well developed, median carina

complete. **Legs:** tasal claws relatively large, claw length greater than ½ width of apex of apical tarsomere, without pectination apically, dorsal surface of metacoxae punctate, rugose on outer surface. **Wings:** hyaline, forewing vein r 0.7 length of 3RSa, second submarginal cell short-trapezoidal, vein 1CUa 0.3-0.4 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest in middle, 1rs 0.6 length of 1M, 1M 0.6 length of M+CU, m+cu an unpigmented wing fold, 0.6 length of 1r-m. **Metasoma:** tergite I rugose-areolate; tergites II and III rugocostate; tergite IV rugulose-areolate, tergite IV a deep, rounded carapace covering apical tergites, interior angle of curvature of tergite IV less than 90°, ventral flange complete apically, recurved apically.

Male.—unknown.

Holotype.—Female: USA: IOWA: Ames, VIII-13-1926, G H. Deposited in NMNH.

Paratype.—Female. USA: SOUTH DAKOTA, Pennington Co., 11 mi. SW Rapid City, Stratsphere Bowl, IX-13-1992, M. Umberger, coll. Deposited in NMNH.

Biology.—host unknown.

Distribution.—known only from type locations Iowa and South Dakota.

Comments.—An all-yellow or nearly all-yellow wasp with rugocostate metasomal sculpturing and a deep, well-developed carapace, similar to *A. arikara.* This species can be distinguished from *A. arikara* by (1) its denser, less bold metasomal sculpturing than the widely spaced, thick metasomal sculpturing of *A. arikara*, (2) extensive punctate sculpturing on the mesopleuron in contrast to absence of extensive punctate sculpturing on mesopleuron of *A. arikara*, (3) forewing vein 1CUa greater than 0.3 length of 1CUb, in contrast to less than 0.3 in *A. arikara*, and carapace internal angle of curvature less than 90°, in contrast to 90° in *A. arikara*.

Etymology.—The specific name is derived from Iowa, the U.S. state in which the type locality lies, and –ensis, a Latin suffix denoting place. The specific name refers to the type locality of this species.

Aleiodes* (*Tetrasphaeropyx*) *itamevorus

Shaw and Marsh 2004: 4-5

Female.—**Body color**: head, mesosoma, and metasoma dark brown or black, face, pronotum, and mesonotum often with yellow markings, legs yellow-orange except coxae and hind tarsi light brown, wings hyaline, veins brown. **Body length**: 3.5-4.5 mm; forewing length, 3.5-4.5 mm. **Head**: ocelli small, ocell-ocular distance greater or equal to 2.0 length of longest diameter of lateral ocellus; 41-44 antennomeres, all flagellomeres distinctly longer than wide; malar space 1.4 or greater than width of mandibular base; occipital carina complete at vertex; oral space small, circular, diameter about 0.75 width of mandible and 0.66 face height. **Mesosoma**: pronotum with scrobiculate sulci laterally, mesonotum and scutellum coriaceous, notauli weakly scrobiculate, meeting posteriorly in rugose area; mesopleuron coriaceous, subalar sulcus rugulose, precoxal sulcus absent; propodeum rugose coriaceous, median carina complete. **Legs**: tarsal claws not pectinate apically, hind coxa coriaceous dorsally. **Wings**: forewing with vein r 0.55- 0.66 length of 3RSa and m-cu, second submarginal cell rectangular to nearly square, vein 1CUa less than or equal to 0.33 length of 1CUb; hind wing with vein RS slightly recurved, marginal cell narrowest in middle, vein 1r-m about 0.75 length of 1M, 1M 0.6-0.7 length of M+CU, vein m+cu pigmented, tubular, about 0.6 length of 1r-m. **Metasoma**: tergites I-IV rugose coriaceous, remainder of apical tergites smooth, tergite IV antero-posteriorly curved, carapace-like.

Male.—Essentially as in female except all coxae dark brown or black.

Material examined (*all paratypes*): 1 female, 2 males: CANADA, ONTARIO, Gogama, 1km S.E., Jct. Hwys 144 & 560, June 15-18, 1988, REARED. Ex: *Itame brunneata*; host plant: *Vaccinium angustifoliium*. K. Barber, & D. Hamilton. Deposited in ESUW.

Distribution.—Known from Ontario and Wisconsin (Shaw *et al*. 2004).

Biology.—Reared from the geometrid *Itame brunneata* (Thunberg) (Shaw *et al*. 2004).

Comments.—This species is similar to *A. maritimus* in MT IV a shallow carapace with internal angle of

curvature greater than 90º, which does not entirely cover 2 or more apical tergites, and does not have defined precoxal sulcus. It can be distinguished from *A. maritimus* by hind wing vein m+cu distinct and tubular.

Etymology.—The specific name is from the name of the host, *Itame*, and *voro* from the Latin, meaning to eat, devour.

Aleiodes (*Tetrasphaeropyx*) *jaliscoensis*

Fortier 2007a: 24-25

Female.—**Body color**: head orange, mandibles orange with black tips, other mouthparts orange except galeae black, ocellar triangle black; scapes orange basally, otherwise black, pedicels black, annelli orange, flagella black, mesosoma orange except metanotum and metapleuron with black, and propodeum entirely black; metasoma black, front coxae**,** trochanters orange, femora, tibiae, and tarsi darker orange brown dorsally, orange ventrally, middle coxae orange, trochanters orange basally, brown apically, trochantelli, femora, tibiae, tarsi brown, hind coxae, trochanters, trochantelli orange and brown, femora black, tibiae black except orange basally, tarsi black except basitarsomeres orange basally, wings hyaline, veins light yellow basally becoming dark brown except fore wing r-m, and (RS+M)b unpigmented, stigmas dark brown, hind wing veins light yellow basally becoming dark brown except posterior 1/2 of cu-a, m-cu, RS, and 1M apicad of r-m unpigmented**. Body length**: 4.7 mm. Fore wing length 4.2 mm. **Head**: malar space equal to basal width of mandible and about 0.3 length of eye height; temple width about 0.5 length of eye width; oral opening nearly circular, small, horizontal diameter 1.4 width of mandibular base, medial height of clypeus about equal to medial height of oral space; occipital carina incomplete medially; 42 flagellomeres, all distinctly longer than wide except basal-most of equal length to second, scape laterally flattened; ocelli large, ocellocular space 0.6 length of longest diameter of lateral ocellus; face coriaceous; frons coriaceous, shiny; vertex rugulose anteriorly, otherwise with transverse carinae, shiny-foveolate posteriorly; temples with one or two transverse carinae anteriorly, foveolate posteriorly; occiput smooth, faintly coriaceous and shining. **Mesosoma**: pronotum coriaceous antero-medially, each side with a scrobiculate transverse sulcus dividing lateral areas of pronotum into dorso-lateral and ventro-lateral sections, ventro-lateral section coriaceous, dorso-lateral section shallowly areolate-rugulose, ventral flange upturned medially, scrobiculate; scutum coriaceous except rugulocostulate posterior medial area, notauli unsculptured terminating in posterior medial area, median carina arising at top of anterior declivity of scutum and running into posteromedial area; scutellar disc coriaceous; mesopleuron costate anterior of nitid central disc, carinae running dorso-ventrally, rugulose posterior to central disc area, sternaular area concave, finely coriaceous-nitid; propodeum areolate-rugose in basal half, rugocostate apically, median carina prominent, straight in basal half, becoming wavy, weak apically; metapleuron rugose. **Legs**: tarsal claws with basal pectination only, inner spur of hind tibia about 0.30 length of hind basitarsus, hind coxae finely areolate-rugulose. **Wings**: hyaline, second submarginal cell elongate, vein r short, 0.5 length of 3RSa, 0.8 of m-cu, 1cu-a beyond 1M by a distance slightly greater than length of 1cu-a, 1CUa 0.3 of 1CUb; hindwing RS slightly recurved, marginal cell narrowed medially, 1M 1.6 of 1r-m, M+CU 1.4 of 1M, m-cu unpigmented, 0.7 of 1r-m. **Metasoma**: tergite I areolate-costate, costae prominent, median carina complete; tergite II areolate-costate, costae more prominent, straighter than those of first tergite, median carina continuous with that of third tergite; tergite III rugulocostulate, costae less prominent, more irregular than those of second tergite, median carina weakly complete apically; tergite IV finely areolate-rugulose, shallowly carapace-like, completely covering tergites apical to it, internal angle of curvature greater than 90º, ventral flange scrobiculate, orange, wider, better defined laterally than apically; ovipositor length 0.6 of length of hind basitarsus.

Male.— essentially as in female.

Holotype.—female: MEXICO: JALISCO, 16 km n. Autlan, July 12-14, 1983, at black light, Kovarik, Harrison, Schaffner colls. Deposited in TAMU.

Paratypes.—2 males: MEXICO: DURANGO, 23 mi. S. Durango, elev. 6,000 ft., July 3, 1964, W. R. M.

Mason, coll. male: MEXICO: DURANGO, 6 mi. E. Durango, July 14, 1964, W. R. M. Mason coll. Male: MEXICO: DURANGO, 6 mi. S. Durango, elev. 6100 ft., July 5, 1964, W. R. M. Mason coll. All paratypes deposited in CNC.

Distribution.—Known only from type localities in Durango and Jalisco, Mexico.

Biology.—Unknown.

Comments.— This species can be distinguished by the combination of the following characters: 1) orange head and scutum, 2) black metasoma with coarse rugocostate sculpturing, 3) shallow carapace entirely covering apical tergites internal angle of curvature greater than 90º, and 4) large ocelli, longest diameter of lateral ocellus nearly twice length of ocell-ocular distance.

Etymology: Named for type locality of holotype in the state of Jalisco, Mexico.

Aleiodes (*Tetrasphaeropyx*) *karankawai* Fortier new species

Female.—**Body color:** head entirely yellow-orange except black interocellar area, antennae black, palps yellow; mesosoma entirely yellow-orange except propodeum with black markings; metasomal tergites I-II yellow-orange, tergites III –IV black; wings hyaline, forewing costal vein C+SC+R honey yellow, M+CU and 1A pale basally, otherwise veins brown, stigma honey yellow basally, brown apically; hind wing veins honey yellow; forelegs entirely yellow-orange; middle legs yellow-orange except femora and tibiae, black apically; hind legs as middle legs except more black on tibiae, black on tarsi. **Body length:** 4.1 mm. forewing length 3.4 mm. **Head:** ocelli large, ocell-ocular diameter 0.4 length of longest diameter of lateral ocellus, 40 flagellomeres, all distinctly longer than wide; malar space short, eyes large, malar space 0.8-1.0 width of mandibular base and 0.3 length of eye height; clypeus weakly swollen, median height equal to oral space median height, oral space small, circular, horizontal diameter 0.8-0.9 width of mandibular base; occipital carina incomplete at vertex; face coriaceous with faint punctation. **Mesosoma:** pronotum transversely bisected by weakly scrobiculate sulci laterally, rugocostate ventro-laterally, rugose dorso-laterally; mesoscutum coriaceous, notauli weakly scrobiculate anteriorly, terminating posteriorly at lateral edges of postero-median rugulose area, strong carina longitudinally bisecting postero-median area; mesopleuron with broadly defined precoxal sulcus with a few carinulae, minutely coriaceous anterior of precoxal sulcus, nitid central disc sparsely punctate anteriorly, area ventral of subalar sulcus costate; propodeum finely rugulose, median carina complete. **Legs:** tarsal claw length greater than 0.5 width of apex of apical tarsomere, not pectinate apically, dorsa of hind coxae finely rugulose. **Wings:** forewing vein r 0.6- 0.7 length of 3RSa, second submarginal cell trapezoidal, vein 1CUa short, 0.2 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest at middle, vein 1r-m 0.6 length of 1M, 1M 0.7 length of M+CU, m+cu a wing crease, 0.6 length of 1r-m. **Metasoma:** tergites I-II shallowly rugulocostulate, tergites III-IV densely, finely rugulose, tergite IV a carapace covering apical tergites, interior angle of curvature of carapace about 90º, ventral flange recurved apically.

Male.—differs from female as follows: 1) brown or black propodeum in contrast to yellow-orange in female, 2) metasomal tergites I-II with deep, strongly defined rugocostation, in contrast to shallowly rugulocostulate in female, and 3) tergites III-IV more coarsely rugocostate, in contrast to fine, dense rugulocostulation in the female.

Holotype.—female: USA: TEXAS: Kenedy Co., Kenedy Ranch, IV-20-2001, light, R. A. Wharton, col. Deposited in TAMU.

Paratypes.—female: USA: TEXAS: Kenedy Co., Kenedy Ranch, Jaboncillos Pasture, dune area, at light, IV-21-2001, Gillogly & Schaffner, colls.; female: USA: ARIZONA, Cochise Co., Portal, VIII-4-1973, UV light, W. Malis & S. Frommer; female: USA: TEXAS, Zapato Co., San Ygnacio, III-18-1994, at light, W. F. Chamberlain, female: USA: CALIFORNIA, Riverside County, Andreas Canyon, III-30-1977; 2 males: USA: TEXAS: Kenedy Co., Kenedy Ranch, at light, IV-20-2001, R. A. Wharton; 1 male: USA, TEXAS: Kenedy

Co., Kenedy Ranch, Jaboncillos Pasture, dune area, UV light, IV-21-2001, Gillogly & Schaffner; male: USA:ARIZONA: Pima Co., Arivaca, VII-26-1941, R. H. Beamer, col.; male: USA: NEW MEXICO: Eddy Co., 32.34ºN, 103.83ºW, light, VIII-6-1979, D. R. DeLorme & C.D. McHugh, colls. All paratypes deposited in TAMU.

Biology.—unknown.

Distribution.—Known from southern Texas, southern Arizona, southern New Mexico, and southern California USA.

Comments.—This species resembles *A. axaceei*. It can be distinguished from that species by 1) larger ocelli, ocell-ocular distance 0.4 length of longest diameter of lateral ocellus, in contrast to 0.8-1.2 in *A. axaceenus*; 2) shorter forewing vein 1CUa, length 0.2 length of 1CUb, in contrast to 0.3 in *A. axaceenus*; 3) legs with extensive yellow, in contrast to nearly all black in *A. axaceei*.

Etymology.—the specific name refers to the Karankawa People, a group of bands of aboriginal people who inhabited the southern gulf coast of Texas, and who spoke Coahuiltecan dialects. They and their language are extinct.

Aleiodes (*Tetrasphaeropyx*) *kisomm* Fortier new species

Female.—**Body color:** head, pronotum, mesoscutum, scutellum bright yellow-orange except antennae and ocellar triangle black, mesopleuron yellow-orange, palps dark brown; mesopleuron bicolored, black ventrally; metathorax black; propodeum black; metasomal dorsum black; all coxae yellow-orange otherwise legs brown; wings hyaline, veins, stigmas brown, tegulas brown. **Body length:** 4.25 mm; fore wing length: 3.0 mm. **Head:** eyes and ocelli small, not covering most of head, ocell-ocular distance about 1.6 diameter of lateral ocellus, all flagellomeres distinctly longer than wide, malar space long, about twice width of mandibular base and about 0.7 length of eye height, occipital carina complete at vertex; clypeus weakly swollen, oral space small, circular, horizontal diameter slightly smaller than mandibular basal width, face coriaceous with a few larger, shallow areolae. **Mesosoma:** pronotum transversely bisected laterally by scrobiculate sulcus, pronotum shelf-like medially, areolate-costate in ventro-lateral corner, punctate dorso-laterally; mesoscutum punctate over coriaceous surface, notauli weakly scrobiculate terminating posteriorly at lateral edges of posterior rugose area; mesopleuron with well-defined precoxal sulcus, faint costulae in precoxal sulcus, mesopleuron apparently extensively foveate but in reality rugose; metapleuron foveate; propodeum declivous posteriorly, median carina weakly present. **Legs:** tarsal claws not pectinate apically, hind coxae foveolate dorsally over coriaceous surface. **Wings:** fore wing with vein r long, about 1.1 length of 3RSa, second submarginal cell short, rectangular, almost square, vein 1CUa about 0.4 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest in middle, vein 1r-m 0.7 length of vein 1M, vein 1M 0.4 length of M+CU, vein m-cu present as an unpigmented fold, 0.5 length of 1r-m. **Metasoma:** tergite I areolate-rugulose; tergite II areolate-rugulose; tergite III foveolate to areolate; tergite VI rugulose-areolate to foveolate, a complete carapace over apical tergites, internal angle of curvature less than 90º, ventral flange of carapace completely recurved apically.

Male.—As female except darker coloration as follows: median area of vertex with black, extensive black on medial and lateral lobes of mesoscutum, scutellum black laterally, mesopleuron bicolored, mostly black, hind coxae mostly black; median carina of propodeum more robust than in female; tergites III and IV more coarsely rugose than in the female and with longer, more abundant pilosity.

Holotype.—female: CALIFORNIA: Riverside, March 16, 1971, J. C. Hall, coll. Deposited in UCR.

Paratype.—male. CALIFORNIA: Riverside, May 5, 1925. Deposited in UCR.

Biology.—host unknown.

Comments.—This species falls within a group of similarly colored species with deep, well developed carapaces and small ocelli that are found in the western and southwestern Nearctic north of Mexico. The

group also includes *A. citriscutum, A. dorsofoveolatus, A. hiisiis,* and *A. dabai*. This species can be separated from *A. citriscutum* and *A. dorsofoveolatus* by its rugocostate metasomal sculpturing in contrast to the foveolate or areolate metasomal sculpturing of the latter 2 species respectively. It can be separated from *A. hiisiis* and *A. dabai* by its extensive foveolate mesopleural sculpturing, in contrast to sparse or no foveolate sculpturing in the latter.

Etymology.—The specific name is from the Blackfeet and means "sun," referring to the bright yellow-orange head and mesoscutal coloration.

Aleiodes (*Tetrasphaeropyx*) *kohook* Fortier new species

Female.—**Body color:** face yellow-orange, frons black except yellow borders around eyes, black extending dorsally, surrounding ocelli, interocellar triangle black, occasionally black patches at postero-lateral edges of vertex; temples, genae yellow-orange; pronotum yellow-orange; propleuron yellow-orange, sometimes with black; scutum, scutellar disc entirely yellow-orange or scutum washed with black at postero-lateral corners, scutellar disc black apically; mesopleuron, metapleuron entirely yellow-orange or metapleural venter only black; propodeum bicolored, black with yellow-orange in apical 1/3 or less; metasomal tergite I black in basal 1/2, yellow-apically; tergite II yellow-orange; tergite III black except yellow basal and apical borders; tergite IV entirely black or black with an apical yellow border; legs yellow-orange except all tarsi black, hind tibiae black in apical 1/2; wings hyaline, forewing veins dark brown/black, stigma dark brown; hind wing veins pale. **Body length:** 3.9-4.0 mm; fore wing length 3.2 mm. **Head:** ocelli medium, ocell-ocular distance 0.9-1.0 length of longest diameter of lateral ocellus; 38-39 flagellomeres, all distinctly longer than wide; malar space 1.0-1.2 width of mandibular base and 0.4 length of eye height; clypeus weakly swollen, medial height 0.8-1.0 length of oral space medial height; oral space small, circular, horizontal diameter equal to width of mandibular base; occipital carina complete at vertex, meeting hypostomal carina ventrally; face coriaceous. **Mesosoma:** pronotum transversely bisected on sides by sulci, sulci scrobiculate in anterior 1/2, pronotum shallowly rugulose-shiny dorso-laterally, shelf-like antero-medially; mesoscutum coriaceous, notauli sparsely scrobiculate in anterior 1/3, more abundantly so in posterior 1/3, without scrobiculation in middle 1/3, notauli terminating at lateral edges of postero-medial rugose area; mesopleural precoxal sulcus broadly defined, with faint rugulation, area surrounding precoxal sulcus minutely, reticulately sculptured; central disc nitid, propodeum rugose areolate, tubercles present, median carina complete. **Legs:** tarsal claw length 1/2 or more width of apical tarsomere apex, not pectinate apically, dorsal surfaces of hind coxae finely, shallowly rugulose-areolate. **Wings:** forewing vein r 0.5-0.7 length of 3RSa, second submarginal cell trapezoidal, vein 1CUa short, 0.20-0.25 length of 1CUb; hind wing with vein RS slightly sinuate, marginal vein narrowest in middle, 1r-m 0.6-0.7 length of 1M, 1M 0.8 length of M+CU, m+cu a faint wrinkle, 0.5 length of 1r-m. **Metasoma:** tergite I rugocostate; tergite II rugocostate with a few prominent, widely spaced costae; tergites III, IV rugulocostulate, tergite IV a complete carapace over apical tergites, interior angle of curvature greater than 90º, ventral flange slightly recurved apically.

Male.—As in female except extensive black on scutum, some basal flagellomeres not clearly longer than wide, 6th flagellomere from antennal base with width 0.9 length of flagellomere; lateral ocelli slightly larger than in females, ocell-ocular distance 0.7 length of longest diameter of lateral ocellus, as opposed to 0.9- 1.0 in females; metasomal tergite II rugocostate, not with prominent, widely spaced costae as in female.

Holotype.—female: USA: WYOMING, Carbon Co., 17 mi. E. of Rawlins, 1.5 mi. N. of Interstate Hwy. 80 at N. Platte River; mixed vegetation; Malaise, VIII/6-21/1991, Mian Inyatullala, coll. Deposited in ESUW.

*Paratype*s.—1 female and 1male: same data as for holotype. Deposited in ESUW.

Biology.—host unknown.

Comments.—This species superficially resembles the Canadian species *A. dissiticarina* Fortier (2007b), with a similar metasomal color pattern and medium-sized ocelli (ocell-ocular diameter 0.9-1.1 length of

longest diameter of lateral ocellus). It can be distinguished from that species by the following: its yellow-orange vertex, temples, and genae in contrast to those areas black in *A. dissiticarina*; its yellow-orange mesopleuron and metapleuron, in contrast to those sclerites black in *A. dissiticarina*, and its more southerly distribution in southern Wyoming in contrast to the presently known range of *A. dissiticarina* across Canada (Fortier 2007b).

Etymology.—The specific name refers to one of the predominant aboriginal people of Wyoming, the Arapaho.

Aleiodes (*Tetrasphaeropyx*) *luhmani* Fortier new species

Female.—Body color: head entirely yellow-orange except inter-ocellar triangle and antennae black, maxillary palpomeres 3–5 brown, labial palps brown; prothorax and mesoscutum yellow-orange with black patches; scutellum yellow-orange medially circumscribed with black peripherally; mesopleuron black except small yellow-orange patch dorsal of mesocoxal articulation; metapleuron bicolored; propodeum black; metasoma nearly entirely black except yellow-orange patches laterally on each tergite; legs nearly entirely yellow-orange except black tarsi; wings infumate, stigmas and wing veins dark brown. Body length: 4.0 mm. *forewing length*: 3.7 mm. Head: ocelli tiny, ocellocular distance 2.2 length of longest diameter of lateral ocellus; vertex coriaceous-punctate; 40 flagellomeres, nearly all apparently about as wide as long, width:length ratio 0.8-0.9; malar space long; eyes small, malar space 0.7 length of eye height and 1.8 width of mandibular base; oral space small and round, clypeus medial height 1.1 length of oral space medial height, oral space horizontal diameter 1.0 width of mandibular base; occipital carina incomplete at vertex; face coriaceous, strigulate in dorsal half. Mesosoma: pronotum bisected on each side by transverse scrobiculate sulcus; pronotum coriaceous ventro-laterally, shiny-minutely rugulose dorso-laterally; mesoscutum coriaceous, notauli scrobiculate in anterior 0.25, terminating at lateral edges of postero-medial weakly rugulose-coriaceous area; scutellum coriaceous; mesopleuron without a precoxal sulcus, coriaceous; propodeum coriaceous-rugulose, shallowly impressed, median carina complete. Legs: tarsal claw length greater than 0.5 width of apex of apical tarsomere, without pectination apically, dorsal surfaces of metacoxae coriaceous-weakly rugulose. Wings: infumate, forewing vein r long, 0.8 length of 3RSa, second submarginal cell short and square, vein 1CUa 0.3 length of 1CUb; hind wing vein RS slightly sinuate, marginal cell narrowest at middle, 1r-m 0.7 length of 1M, 1M 0.7 length of M+CU, m+cu pigmented, 0.8 length of 1r-m. Metasoma: tergites I and II shallowly, finely rugulocostulate, tergite II with longitudinal costae more prominent than in tergite I; tergites III and IV shallowly, finely rugulose, tergite IV a shallow carapace entirely covering apical tergites, without a well defined recurved flange, internal angle of curvature greater than 90°.

Male.—Unknown.

Holotype.—Female: USA, WISCONSIN, Burnett Co., Grantsburg, Johnson Rd., Malaise, May 1, 1999, M. Saborin coll. Deposited in UMSP.

Biology.—unknown.

Distribution.—known only from type locality in northwestern Wisconsin.

Comments.—A bicolored wasp with bright yellow-orange head, mesoscutum, and legs, otherwise mostly black with infumate wings and shallow, relatively undeveloped carapace that nonetheless covers all apical tergites. This species can be distinguished from its closely similar sibling species *A. paraluhmanus* as follows: 1) mesopleuron nearly entirely black except small yellow-orange patch dorsal of mesocoxal articulation in contrast to the mesopleuron yellow-orange in entire dorsal half in the latter species; 2) metasomal tergites II and IV entirely black postero-medially in contrast to extensively yellow-orange postero-medially in the latter species; 3) forewing second submarginal cell short and square in contrast to elongate-rectangular in the latter species; and 4) forewing vein 1CUa longer, 0.3 length of 1CUb, in contrast to shorter vein 1CUa, 0.2 length of 1CUb in the latter species.

Etymology.—The specific name is after John Luhman, ichneumonidologist at the University of Minnesota.

Aleiodes (*Tetrasphaeropyx*) *magnoculus* Fortier new species

Female.—**Body color:** head, mesosoma, metasoma entirely yellow-orange except black interocellar triangle, metasomal tergite III washed with black, tergite IV mostly or completely black, antennae black, palps pale yellow, legs yellow-orange except hind tibiae and tarsi usually washed with black, front wing veins pale or yellow basally, becoming dark brown apically, stigmas bicolored yellow basally, black apically. **Body length:** 4.1-4.5 mm. forewing length: 3.3-3.7 mm. **Head:** ocelli large, ocell-ocular distance 0.2-0.4 length of longest diameter of lateral ocellus; 38-40 flagellomeres, all distinctly longer than wide; malar space short, eyes large, malar space equal to width of mandibular base and 0.2-0.25 length of eye height, clypeus weakly swollen, medial height 0.9-1.25 length of oral space height, oral space small, circular, horizontal diameter about equal to width of mandibular base; occipital carina incomplete at vertex; face coriaceous. **Mesosoma:** anterior 2/3 of each side of pronotum transversely bisected by scrobiculate sulcus, pronotum shiny-rugose dorso-laterally; mesoscutum coriaceous, notauli weakly scrobiculate in anterior declivity of mesoscutum, terminating at antero-lateral corners of finely rugulose poster-medial area; mesopleuron with broad precoxal sulcus, precoxal sulcus with well defined carinulae, mesopleuron coriaceous anterior to precoxal sulcus, costate below subalar sulcus; propodeum rugulocostulate, postero-lateral tubercles small, undeveloped, medial carina complete. **Legs:** tarsal claw length greater than 0.5 apical width of apical tarsomere, without pectination apically, dorsal surface of metacoxae with faint sculpturing, long pilosity. **Wings:** forewing vein r 0.5-0.75 length of 3RSa, second submarginal cell trapezoidal, vein 1CUa 0.2-0.28 length of 1CUb, hind wing with vein RS slightly sinuate, marginal cell narrowest in middle, 1r-m 0.6 length of 1M, 1M 0.6 length of M+CU, m+cu an unpigmented fold, 0.5 length of 1rm. **Metasoma:** tergites I-IV delicately ruglocostulate, tergite IV a carapace covering apical tergites, interior angle of curvature of carapace greater than 90°, ventral flange complete, slightly recurved apically.

Male.—as in female except usually with darker amber coloration rather than light yellow-orange as in female, metasomal tergite sculpturing heavily rugulocostulate rather than delicately so as in female.

Holotype.—female: USA: TEXAS, Bell Co., Hwy 36, 4mi. NW Temple, 21 June 1978, Robbins, Critchfield, colls. Deposited in NMNH.

Paratypes.—female: USA: ARIZONA, Elfrida, May 2, 1956, F.Werner, G.Butler, swept alfalfa, Deposited in NMNH; male: MEXICO: Chihuahua, 5 mi. S. Matamoros, August 3, 1967. Deposited in TAMU; male: MEXICO: Chihuahua, Del Parral, 8 mi. NE Hidalgo, July 18, 1964. Deposited in UCB.

Biology.—unknown

Comments.—This species resembles *A. quickei*, another relatively common yellow Texas *A.* (*Tetrasphaeropyx*) species witih large ocelli. This species can be distinguished from *A. quickei* by females with dark brown-black metasomal tergite IV coloration in contrast to yellow-orange coloration in *A. quickei*.

Etymology.—The specific name refers to the large eyes and ocelli, and is derived from the Latin prefix *magna* meaning large, and *oculus*, meaning eye.

Aleiodes (*Tetrasphaeropyx*) *maheono* Fortier new species

Female.—**Body color:** face, temples, genae yellow-orange with black highlights, frons, vertex, antennal flagella, occiput black; pronotum yellow-orange, propleuron black, scutum bicolored, mostly black, notauli yellow; mesopleuron yellow-orange laterally, venter black; propodeum with black, tubercles yellow-orange;

metasomal tergite I black basally, yellow-orange apically; tergite II yellow-orange, tergite III mostly black with yellow apical border, tergite IV black; forelegs yellow-orange except black coxae, tarsi; middle legs yellow-orange except black tarsi; hind legs with bicolored coxae, femora and tibiae yellow basally, becoming infumate apically, tarsi black; wings hyaline, forewing veins brown, stigmas bicolored, yellow basally, black apically; hind wing veins colorless. **Body length:** 3.4 mm. forewing length: 3.2 mm. **Head:** ocelli small, ocell-ocular distance 1.2 length of longest diameter of lateral ocellus; basal 20 flagellomeres all distinctly longer than wide; malar space long, 1.5 width of mandibular base and 0.4 length of eye height; clypeus median height equal to oral space median height, oral space small, circular, horizontal diameter equal to width of mandibular base; occipital carina narrowly incomplete at vertex; face coriaceous. **Mesosoma:** pronotum transversely bisected on anterior half of each side by scrobiculate sulcus, coriaceous-rugulose in ventro-lateral corner, shallowly rugulose-shiny dorso-laterally; mesoscutum coriaceous, notauli shallowly impressed, terminating posteriorly at transcutal articulation; mesopleural sternaular area shallow, diffusely defined, coriaceous, central disc nitid, with sparse punctation anteriorly, propodeum with compact, deeply impressed dense areolation, median carina complete. **Legs:** tarsal claws small, about 0.5 width of apex of apical tarsomere, dorsal surfaces of hind coxae rugulose. **Wings:** forewing vein r short, 0.5 length of 3RSa, second submarginal cell elongate-trapezoidal, 1CUa 0.3 length of 1CUb; hind wing vein RS slightly sinuate, marginal vein narrowest at middle, 1r-m 0.7 length of 1M, 1M 0.7 length of M+CU, m+cu absent. **Metasoma:** tergite I with compact, dense areolation in anterior black area, rugocostate in posterior orange area; tergite II rugocostate; tergites III and IV successively more finely, densely rugulocostulate, tergite IV a carapace covering apical tergites; interior angle of curvature 90°, ventral flange entire, recurved apically.

Male.—differs from female as follows: 1) metasomal tergite II black, in contrast to yellow-orange in female; 2) tergite II sculpturing heavily rugose, in contrast to rugocostate in female; 3) sculpturing of tergites III-IV coarser than in female.

Holotype.—female: USA: WYOMING, Carbon Co., 17 mi. E. of Rawlins, 1.5 mi. N. of Interstate Hwy. 80 at N. Platte River; mixed vegetation; Malaise, VIII/6-21/1991, M. Inyatulla, coll. Deposited in ESUW.

Paratype.—male: same data as for holotype. Deposited in ESUW.

Biology.—host unknown.

Distribution.—known only from holotype locality in Carbon County, Wyoming, USA.

Comments.—This species is similar to *A. kohook*. It can be distinguished from that species as follows: 1) female with nearly entirely black mesoscutum in contrast to entirely yellow-orange in *A. kohook*; 2) female MTII with rugocostate sculpturing and no predominant, bold longitudinal costae in contrast to such costae present in *A. kohook*; 3) male with black metasomal tergite II, in contrast to yellow-orange in male *A. A. kohook*.

Etymology.—The specific name means 'spirit being' in the language of the Cheyenne, one of the predominant aboriginal people of Wyoming.

Aleiodes (*Tetrasphaeropyx*) *maidunus* Fortier new species

Female.—**Body color:** head orange except frons, vertex, occiput black; palps and antennae black, mandibles with extensive black (50%); pronotum yellow, propleuron black; mesoscutum bicolored orange and black; scutellum orange or bicolored; mesopleuron bicolored, orange dorsally, black ventrally; metasoma, propodeum black; metasoma entirely black (50%) or black withyellow highlights, legs with orange, black or bicolored coxae, black trochanters, orange trochantellae, bicolrred mostly orange femora, black tibiae and tarsi; wings hyaline, veins and stigmas black. **Body length:** 3.8-4.2 mm; fore wing length: 3.0-3.1 mm. **Head:** ocelli small, ocell-ocular distance 1.7 length of longest diameter of lateral ocellus; 40 flagellomeres, flagelllomeres all distinctly longer than wide; malar space long, 1.3 width of mandibular base and 0.5 length of eye height; clypeus medial height 1.0 length of oral space medial height, oral space small, circular,

horizontal diameter 1.1 width of mandibular base; occipital carina complete at vertex, meeting (50%) or not meeting hypostomal carina ventrally; face coriaceous, vertex with 1 or more transverse carinulae. **Mesosoma:** precoxal sulcus distinct, carinulate, mesosoma rugulose; propodeum with deeply impressed bold rugose-areolation, median carina complete. **Legs:** tarsal claws longer than apical width of apical tarsomere, not pectinate apically, metacoxae rugose dorsally. **Wings:** forewing vein r 0.6-0.7 length of 3RSa, second submarginal cell trapezoidal, 1CUa 0.3 length of 1CUb; hind wing vein RS recurved, marginal cell narrowest at middle, 1r-m 0.7 length of 1M, 1M 0.6 length of M+CU, m+cu pigmented, 0.7 length of 1r-m. **Metasoma:** tergites I-II heavily, coarsely rugose, III-IV finely, more densely rugose, tergite IV a carapace entirely covering apical tergites, flange unpigmented, recurved apically, internal angle of curvature about 90°.

Male.—essentially as in female except extensive black on face, temples, genae.

Holotype.—female: USA: CALIFORNIA, Lassen Co., Lassen N.P. Snag Lake, IX-8-1990. Deposited at UCD.

Biology.—host unknown.

Comments.—This species resembles the following species with contrasting bright yellow-orange head and mesosoma, black metasomal coloration, and deep carapace: *A. dorsofoveolatus A. hiisiis, A. kisomm*, and *A. citriscutum*. It differs from *A. dorsofoveolatus* and *A. citriscutum* in that the mesopleural sculpturing is not heavily foveate anterior to the central disc as in the latter. This species is also closely similar to *A. dabai, A. hiisiis and A. kisomm*. It differs from *A. hiisiis* in 1) having completely black propodeal coloration and black metapleural coloration, and from *A. kisomm* in 1) having rugose mesopleural sculpturing anterior to the central disc and 2) rugulose metapleural sculpturing, rather than heavily foveate sculpturing throughout these areas, as in *A. kisomm*. It can be distinguished from *A. dabai* by its 1) black frons, vertex, and occiput, and 2) much coarser, more deeply impressed rugosity on tergites I and II.

Etymology.—The specific name refers to the Maidu People of northeastern California.

Aleiodes (*Tetrasphaeropyx*) *mannegishii* Fortier new species

Female.—**Body color:** head entirely yellow-orange except black inter-ocellar triangle, palps yellow, scapes and pedicels bicolored with extensive yellow-orange, flagellae black; mesosoma yellow-orange except sometimes with black on metapleura and/or propodeum; metasomal tergite I yellow-orange apically and infumate or black basally and laterally; tergite II yellow with longitudinally running lateral brown marks; tergites III and IV entirely black, tergite IV paler at apex; legs yellow-orange except hind tibiae brown posteriorly and all tarsi with brown; wings hyaline, forewing veins brown, stigmas yellow basally, otherwise brown; hind wing veins yellow. **Body length:** 4.2-4.3 mm. Forewing length 3.5 mm. **Head:** ocelli large, ocell-ocular distance 0.2-0.3 length of longest diameter of lateral ocellus; 39-40 flagellomeres, some flagellomeres between basal and 15th flagellomeres apparently about as long as wide; width/length ratio greater than 0.8; malar space short, eyes large, malar space 0.3 length of eye height; clypeus medial height 1.0-1.1 length of oral space medial height; oral space small, circular, horizontal diameter equal to width of mandibular base; occipital carina incomplete at vertex, meeting (50%) or not meeting hypostomal carina ventrally; face apparently coriaceous. **Mesosoma:** pronotum transversely bisected by strongly scrobiculate sulci laterally, costate ventro-laterally, shiny, shallowly rugulose dorso-laterally; mesoscutum coriaceous, notauli scrobiculate anteriorly, terminating at lateral edges of postero-median rugulose area; mesopleuron with precoxal sulcus compact, concave, mesopleuron sculpturing predominantly coriaceous; propodeum densely rugulose-areolate, postero-lateral tubercles well developed and predominant, median carina complete. **Legs:** tarsal claw length about 0.5 width of apex of apical tarsomere, dorsa of hind coxae coriaceous. **Wings:** forewing vein r 0.5- 0.7 length of 3RSa, second submarginal cell trapezoidal, vein 1CUa short, 0.2 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest at middle, vein 1r-m long, 0.75-0.80 length of 1M, 1M 0.6-0.65 length of M+CU, m+cu a wing crease, 0.3-0.5 length of 1r-m. **Metasoma:** tergites

I-II shallowly rugocostate, tergite III rugulocostulate; tergite IV densely rugulose, a carapace covering apical tergites, interior angle of curvature of carapace about 90°, ventral flange recurved apically.

Male.—unknown.

Holotype.—female: USA: TEXAS: Kenedy Co., Kenedy Ranch, IV-20-2001, light, R. A. Wharton, col. Deposited in NMNH.

Paratype.— female: USA: TEXAS: Bell Co., Hwy 36, 4 mi. SW Temple, VI-21-1978, Robbins, Critchfield, colls., emerged from instar IV *Semiothisa cyda* (Druce)(Geometridae). Deposited in NMNH.

Biology.—Reared from geometrid *Semiothisa cyda*.

Distribution.—Known from type localities in Kenedy and Bell Counties, Texas.

Comments.—This species is similar to *A. karankawai and A. axaceei* in black metasomal tergites III and IV contrasting with otherwise nearly all-yellow-orange soma, short forewing vein 1CUa, and tergite IV carapace-like with internal angle of curvature about 90°. It is similar to *A. karankawai* and different from *A. axaceei* in very large ocelli (ocell-ocular distance less than 0.5 length of longest diameter of lateral ocellus) in contrast to ocelli of *A. axaceei* (ocell-ocular distance 0.8-1.2 length of longest lateral ocellar diameter). It may also be distinguished from these species by 1) the absence of black on all femora in this species, 2) the relatively long hind wing 1r-m, 0.75-0.80 length of 1M, in contrast to 0.6 length of 1M in those species, and 3) large postero-lateral tubercles on propodeum.

Etymology.—the specific name refers to tricksters called the Mannegishi, with large eyes, mythical "little people" described by the Cree People.

Aleiodes (*Tetrasphaeropyx*) *marinensis* Fortier new species

Female.—**Body color:** entirely yellow-orange except black in inter-ocellar triangle, wings hyaline, veins light yellow-brown, stigmas bicolored, yellow basally and apically, brown medially. **Body length:** 5.5 mm, forewing length 4.2 mm. **Head:** ocelli small, ocell-ocular diameter 1.5 length of longest diameter of lateral ocellus; basal-most 15 flagellomeres distinctly longer than wide, width/length ratio less than 0.8 for each flagellomere; malar space long, 1.9 width of mandibular base and 0.64 length of eye height; temple wide, 0.8 width of eye; oral space small, clypeus medial height 0.7 oral space medial height, oral space horizontal diameter 0.8 width of mandibular base. **Mesosoma:** pronotum weakly shelf-like, coriaceous ventro-laterally, thick rugation dorso-laterally; mesoscutum coriaceous, notauli evenly scrobiculate along length, terminating at antero-lateral edges of rugose postero-medial area; mesopleuron without a precoxal sulcus, extensively rugose; propodeum heavily rugose, median carina incomplete. **Legs:** tarsal claws small, without apical pectination, metacoxae coriaceous, minutely rugulose. **Wings:** forewing vein r short, 0.5 length of 3RSa, second submarginal cell elongate-rectangular, 2RS 0.5 length of 2M, 1CUa 0.35 length of 1CUb; hind wing RS slightly sinuate, marginal cell narrowest at middle, 1r-m 0.5 length of 1M, 1M 0.9 length of M+CU, thus 1M long, m+cu absent. **Metasoma:** tergite I long, narrow, apical width equal to length of tergite, rugocostate; tergite II more finely rugocostate than tergite I; tergites III-IV finely rugulocostulate, tergite IV a shallow carapace not entirely covering tergite V; ventral flange of tergite IV not recurved..

Male.—Essentially as in female.

Holotype.—female: USA: CALIFORNIA, Marin Co., Alpine Lake, 1 mi. N., June 3, 1964, P. Rude, coll. Deposited in UCD.

Paratype.—male: USA, CALIFORNIA, Mono Co., 11 mi. N.W. Bridgeport, Buckeye camp, 2200m, September 2, 1990, B. Scaccia, coll. Deposited in UCD.

Biology.—host unknown.

Distribution.—Known only from type localities in Marin and Mono Counties, California, USA.

Comments.—This all yellow species is distinguished by the following combination of characters: 1) long forewing submarginal cell, 2RS 0.5 length of 2RM; 2) long hind-wing vein 1M, 2.0 length of 1r-m and 0.9

length of M+CU, 3) long, narrow metasomal tergite I, apical width/tergite length ratio 1.0, and 4) nearly flat carapace (MTIV).

Aleiodes maritimus

Shaw and Marsh 2004: 6-7

Female.—**Body color**: head, mesosoma, and metasoma dark brown or black, head often with yellow marking on face and vertex; pronotum often entirely or partly yellow; mesoscutum occasionally with a pair of yellow spots at antero-lateral corners near bases of notauli; metasomal tergite II often yellow; legs yellow-orange except brown on the following: fore- and middle tarsi, hind femur at apex, hind tibia, hind tarsus; wings hyaline, veins brown. **Body length**: 3.5-4.5 mm; forewing length, 3.0-3.5 mm. **Head**: ocelli medium, ocell-ocular distance only slightly greater than longest diameter of lateral ocellus; 42-43 antennomeres, all flagellomeres distinctly longer than wide; malar space moderate, about equal in length to basal width of mandible and about 0.3 eye height; occipital carina complete at vertex; oral space small, circular, diameter about equal to basal width of mandible; head coriaceous, face and vertex sometimes wakly rugulose. **Mesosoma**: pronotum with scrobiculate sulci laterally, otherwise pronotum weakly coriaceous; mesonotum and scutellum coriaceous, notauli weakly scrobiculate, meeting posteriorly in weakly rugose area; mesopleuron coriaceous, subalar sulcus weakly rugulose, precoxal sulcus absent; propodeum strongly rugose-areolate dorsally, coriaceous laterally, median carina complete. **Legs**: tarsal claws not pectinate apically, hind coxa coriaceous dorsally. **Wings**: forewing with vein r about 0.6 length of 3RSa and m-cu, second submarginal cell rectangular to nearly square, vein 1CUa short, about 0.25 length of 1CUb; hind wing with vein RS slightly recurved, marginal cell narrowest in middle, vein 1r-m about 0.66 length of 1M, 1M about 0.66 length of M+CU, vein m+cu an unpigmented, wrinkle. **Metasoma**: tergite I rugolucostulate, long, apical width shorter than tergite length; tergite II rugolucostulate, tergites III and IV rugose, tergite IV weakly carapace-like, internal angle of curvature greater than 90°, not entirely covering apical tergites, all of which are smooth.

Male.—Essentially as in female, 42-44 flagellomeres

Holotype.—Female: NEWFOUNDLAND, South "Branch, July 17-23, 1974, G. Heinrich, mal. Trap. Deposited in CNC.

Material examined (*paratypes*).—female: CANADA, NEWFOUND, South Branch, Malaise trap, July 17-23, 1974, G. Heinrich, coll.; male: same information as female except July 29-31, 1974; male, CANADA, NEW BRUNSWICK, Kouchibouguac N.P., July 11, 1977. M. Ivanochko, coll. Paratypes deposited in ESUW.

Distribution.—Most specimens in the type series are from the maritime provinces of Newfoundland, New Brunswick, and Nova Scotia. However, a few specimens from central and eastern Canada and Minnesota are also recorded, indicating that this species is probably widespread in the northern Nearctic (Shaw *et al*. 2004).

Biology.—Reared from the following geometrids: *Semiothisa, granitata* (Guenee), *S. sexmaculata* Packard, and *S. signaria dispuncta* (Walker). The host caterpillars feed on various coniferous trees including pitch pine, scrub pine, firs, hemlocks, spruces, and larch (Shaw *et al*. 2004).

Comments.—This species is similar to *A. itamevorus* in MT IV a shallow carapace with internal angle of curvature greater than 90°, which does not entirely cover 2 or more apical tergites. Additionally, the mesopleuron in both species does not have defined precoxal sulcus. It can be distinguished from *A. maritimus* by hind wing vein m+cu weak and unpigmented, and by the metasomal tergites rugocostate, in contrast to rugose-coriaceous in *A. maritimus.*

Etymology.—The specific name is from the Latin *maritimus* meaning "of the sea" in reference to the distribution of most of the type series in the maritime provinces of Canada.

Aleiodes (*Tetrasphaeropyx*) *min* Fortier
new species

Female.—**Body color:** entirely yellow-orange except as follows: black inter-ocellar triangle and antennal flagella, wings hyaline, stigmas bicolored, brown apically. **Body length:** 4.0 mm. Forewing: 3.3 mm. **Head:** ocelli small, ocell-ocular distance 1.7 length of longest diameter of lateral ocellus; 1 flagellomeres, all distinctly longer than wide in basal half; malar space long, 1.5 width of mandibular base and 0.6 length of eye height; oral space small, horizontal diameter 0.8 width of mandibular base; occipital carina complete at vertex, meeting hypostomal carina ventrally; face rugose medially, coriaceous laterally. **Mesosoma:** pronotum transversely bisected by porcae sulcus, pronotum shelf-like medially, shallowly rugulose-shiny dorso-laterally; mesoscutum coriaceous, notauli scrobiculate, terminating at lateral edges of rugulose medial area; mesopleuron coriaceous in lower half, precoxal sulcus shallow, rugulose-coriaceous, mesopleuron rugulose-foveolate postero-ventral to nitid central disc; rugocostate in area antero-dorsal to central disc; propodeum with coarse, loosely defined rugation, steeply declivous, flattened posteriorly, median carina complete. **Legs:** claws large, length greater than apical width of apical tarsomere, dorsal surfaces of metacoxae shallowly, finely shiny-rugulose. **Wings:** forewing vein r 0.6 length of 3RSa, submarginal cell elongate-trapezoidal, vein 1CUa short, 0.2 length of 1CUb; hind wing with RS slightly recurved, marginal cell narrowest in middle, vein r-m 0.6 length of 1M, 1M 0.7 length of M+CU, m+cu an unpigmented wing crease 0.6 length of 1r-m. **Metasoma:** tergite I rugose, tergite II rugocostate, tergite III rugose-areolate, tergite IV rugulose, a carapace entirely covering apical tergites, ventral flange with well-developed recurvation apically, internal angle of curvature about 90°.

Male.—specimen missing head, essentially as in female except metasomal tergite sculpturing coarser, hind tibiae and tarsi extensively black.

Holotype.—female. USA: NEBRASKA, Thomas Co., Thedford, VIII-9-1955, Carl W. Rettenmeyer, coll. Deposited in NMNH

Paratype.—male: USA: NEBRASKA, Thomas Co., Halsey, IX-8-1957, R. Henzlik, coll. Deposited in NMNH.

Biology.—host unknown.

Comments.—Similar to *A. dakotensis, A. arikara,* and *A. iowensis* in extensive yellow-orange coloration, small ocelli, heavy rugosity on tergites, and carapace relatively deep with internal angle of curvature about 90°. This species may be distinguished from *A. dakotensis* and *A. arikara* by its denser, less bold metasomal sculpturing, and from *A. iowensis* by 1) lack of extensive punctation on mesopleuron and 2) forewing with shorter 1CUa: 0.2 length of 1CUb in contrast to 0.3 in *A. iowensis*.

Etymology.—The specific name is the Omaha word for "sun," apropos for the bright yellow coloration of the species. The Omaha People at one time lived along the Missouri River in eastern Nebraska, in the vicinity of the type locality.

Aleiodes (*Tetrasphaeropyx*) *nigrilatus* Fortier
new species

Female.—**Body color:** head orange, face mottled with darker pigmentation, black interocellar triangle, antennae brown, mesosoma orange, pronotum with irregular dark mottling laterally; first 3 metasomal tergites yellow-orange with black border laterally and transversely on tergite III forming an elliptical pattern; tergite IV yellow-orange or black; legs yellow-orange, wings hyaline, veins yellow, darker apically in forewing, stigma variable, unicolored brown or bicolored, yellow basally and black apically. **Body length:** 3.8 mm; forewing length: 3.0 mm. **Head:** ocelli large, ocell-ocular distance 0.4-0.7 length of longest diameter of lateral ocellus; 35 flagellomeres, all distinctly longer than wide; malar space short, equal to width of mandibular base, 0.3 length of eye height; clypeus weakly swollen, medial height equal to medial height of oral space,

oral space small, circular, horizontal diameter 0.9-1.0 width of mandibular base; occipital carina incomplete at vertex, meeting hypostomal carina ventrally; face shallowly punctate. **Mesosoma:** pronotum transversely bisected by scrobiculate sulcus laterally, scrobiculate sculpturing complete along length of sulcus, pronotum rugose-areolate-shiny dorso-laterally; mesoscutum coriaceous, notauli weakly developed, terminating at lateral edges of postero-medial rugose area; mesopleuron with faintly defined precoxal sulcus, precoxal sulcus with faint carinulation; propodeum rugose-areolate, median carina complete. **Legs:** tarsal claw length greater than half the width of apical tarsomere apex, not pectinate apically, dorsal surface of hind coxae coriaceous. **Wings:** forewing with vein r 0.6-0.7 length of 3RSa, second submarginal cell trapezoidal, 1CUa 0.25-0.30 length of 1CUb; hind wing vein RS slightly sinuate, marginal cell narrowest in middle, 1r-m 0.6 length of 1M, 1M 0.65 length of M+CU, m+cu an unpigmented fold, 0.6-0.7 length of 1r-m. **Metasoma:** tergites I-III rugocostate; tergite IV rugulose, a complete carapace over apical tergites, ventral flange slightly or not recurved apically, interior angle of curvature of tergite IV slightly less than 90°.

Male.—essentially as in female except 39 flagellomeres instead of 35, sculpturing of metasomal tergites more boldly defined.

Holotype.—female: USA:TEXAS, Big Bend National Park, Boquillas, 1800 ft., V-23-1959, W. R. M. Mason. Deposited in TAMU.

Paratypes.—female: USA, TEXAS, Cameron Co., VIII-3-1928, R. H. Beamer; 2 females: USA, ARIZONA, Santa Rita Mission, July 12, 1950. R. H. Beamer. Deposited in SNOW.

Biology.—host unknown.

Comments.—This species resembles *A. paraocopiosus* Fortier. It differs from that species in 1) metasomal tergite III sculpturing usually bolder and rugocostate in contrast to shallowly rugulocostulate in *A. paracopiosus*, and 2) with a black elliptical pattern on the metasomal dorsum, unlike the irregular dark blotching in *A. paraocopiosus*.

Etymology.—The specific name refers to the black edges of metasomal terites I–III.

Aleiodes* (*Tetrasphaeropyx*) *oaxacensis

Fortier 2006b: 480–481

Female.—**Body color**: Body nearly uniformly yellow; head yellow, mandibles yellow with black tips, other mouthparts yellow; scape yellow, pedicel brown, flagellum black; mesosoma yellow; legs yellow; metasoma yellow; wings lightly dusky, veins dark brown except forewing r-m white, posterior half of hind wing cu-a white, stigma pale yellow in basal corner, otherwise dark brown, legs yellow-orange except mesotibiae dark orange, metatibiae darker brown, fore tarsi, mesotarsi brown, metatarsi black. **Body length**: 4.4mm, forewing length: 3.6mm. **Head**: malar space long, 1.7 of basal width of mandible and 0.5 of eye height; temple wide, about 0.9 of eye width; oral opening nearly circular, small, horizontal diameter slightly larger than mandibular basal width and 0.4 of facial height, clypeus, medial height of clypeus 0.6 of medial height of oral opening; occipital carina strongly complete medially, meeting hypostomal carina ventrally; 39 flagellomeres, all slightly longer than wide, first slightly longer than second; ocelli small, ocellocular space 1.6 of width of lateral ocellus; face foveolate-coriaceous, small, faint facial ridge running from between antennae about 1/4 length of face; frons coriaceous ventral of anterior ocellus, vertex foveolate-coriaceous laterad of ocelli, rugocostate posteriad of ocelli, carinae running laterally across vertex; temples rugulose**;** occiput smooth-coriaceous and shining. **Mesosoma**: posteromedial area of pronotum widely scrobiculate, pattern continuing in lateral sulci which divides lateral portion of pronotum into dorsolateral and ventrolateral sections, pronotum with nitid shelf antero-dorsally, dropping abruptly anteriorly onto a scrobiculate, upwardly curved flange, the surface of drop coriaceous, dorsolateral section of pronotum foveolate, ventrolateral section finely foveolate; scutum entirely foveolate- coriaceous except posterior rugulose area between notauli; notauli unsculptured anteriorly, becoming ruglose posteriorly, terminating anterior to pre-scutellar carina; scutellar disc foveolate-coriaceous, mesopleuron smooth-foveolate to smooth punctate, central disc nitid**,** weak carinae

in concave sternaular area; propodeum entirely smooth foveolate, complete median carina. **Legs**: tarsal claws with basal pectination only, inner spur of hind tibia about 0.40 length of hind basitarsus, hind coxa smooth-punctate. **Wings**: lightly dusky, second submarginal cell nearly square; fore wing with vein r 0.8 length of 3Rsa and slightly longer than m-cu; 1cu-a beyond M by a distance equal to length of 1cu-a, 1CU-a 0.4 of 1CU-b; hind wing RS slightly recurved, marginal cell narrowed medially; 1M twice as long as r-m; M+CU 1.6 of 1M, m-cu pigmented and 0.6 of r-m. **Metasoma**: first through fourth metasomal tergites smooth-foveolate, median carinae complete in first and second, incomplete in third, terminating in apical fourth of length of the tergite; fourth metasomal tergite rounded, deeply carapace-like, completely covering tergites apical to it, wider and longer at mid-depth than along ventral flange, ventral flange white, faintly scrobiculate; ovipositor length 0.8 length of hind basitarsus.

Male.— Unknown.

Holotype.—Female: MEXICO, Oaxaca, 1.1 mi. W. El Tule, July 9, 1987, Lovarik and Schaffner. Deposited in NMNH.

Biology.—host unknown.

Distribution: Known only from type locality in Oaxaca.

Comments: Combination of orange body, black legs, and small ocelli are distinctive.

Etymology.—Name refers to holotype locality

Aleiodes* (*Tetrasphaeropyx*) *parabretti

Bardon and Fortier in press

Female.—**Body color**: head yellow-orange except black interocellar area and some black marking on vertex, antennae black, palps yellow; pronotum and propleuron yellow orange; mesoscutum black or mostly black, bicolored with yellow-orange; scutellum black; mesopleuron bicolored black and yellow-orange laterally, black ventrally; dorsum of metasoma black except apex of tergite I and entirety of tergite II yellow; legs yellow-orange except apical half of tibiae and entirely of tarsi dusky; wings hyaline, fore-wing veins light brown, stigma brown; hind wing veins yellow. **Body length**: 3-3.8 mm. forewing length: 2.9-3.1 mm. **Head**: flagellomeres all distinctly longer than wide, malar space 1.2-1.3 width of mandibular base and 0.3 length of eye height; temple width 0.6 length of eye width; occipital carina incomplete at vertex; ocelli medium, longest diameter of lateral ocellus 0.9-1.1 length of ocell-ocular distance; oral space small, circular, horizontal diameter 1.2 width of mandibular base; face coriaceous, vertex weakly transversely costate. **Mesosoma**: pronotum bisected on each side with transverse scrobiculate sulcus, shiny-shallowly rugulose dors-laterally; mesoscutum coriaceous, notauli weakly scrobiculate ending posteriorly at lateral edges of postero-medial rugocostate area, scutellar disc rugose-areolate; mesopleuron with precoxal sulcus large, elongate longitudinally, well defined, coriaceous-costulate, mesopleuron costate antero-dorsally of precoxal sulcus, rugulose below subalar sulcus, foveolate postero-ventral and anterior to shiny central disc, central disc foveolate along anterior edge; propodeum rugose, median carina complete. **Legs**: metacoxae shiny-rugulose-areolate, tarsal claws small, without apical pectination. **Wings**: forewing second submarginal cell trapezoidal, nearly rectangular, vein r 0.5 length of 3RSa, 1CUa variable, 0.2-0.3 length of 1CUb; hind wing with vein RS slightly recurved, marginal cell narrowest in middle, vein 1r-m 0.6 length of 1M, 1M 0.6 length of M+CU, m+cu an unpigmented wrinkle, 0.6 length of 1r-m. **Metasoma**: tergites I-II rugulocostulate, tergites III-IV rugulose-areolate; tergite IV a shallow carapace covering apical tergites, ventral flange incomplete apically, internal angle of curvature greater than 90º.

Male.—unknown.

Holotype.—female: USA: MARYLAND, Prince George Co., Patuxent, August 6, 1996, ex: *Semiothisa aemulataria*, host plant box elder (*Acer negundo*), adult emerged August 26, 1996, A.S.C. coll. Deposited in ESUW.

Paratype.—female: USA: MARYLAND, Prince George Co., PRCW, September 23, 1996, ex: *S.*

aemulataria, Host plant box elder (*Acer negundo*), adult emerged August 26, 1996, A.S.C., coll. Deposited in ESUW.

Biology.—reared from geometrid *Semiothisa aemulataria* collected from box elder (*Acer negundo*)

Distribution.—Known only from type locality in Prince George Co., Maryland, U.S.A.

Comments.—A bicolored species with metasoma black except bright pale yellow tergite II. This species resembles *A. shawi* and *A. bretti*. It can be distinguished from the former by scutum with extensive black, in contrast to entirely yellow on the former. It can be distinguished from both *A. shawi* and *A. bretti* by the very shallow carapace and internal angle of curvature much greater than 90°, in contrast to those species, in which carapace internal angle of curvature is about 90°.

Etymology.—The specific name refers to the close similarity of this species to *A. bretti*. The prefix *para* is from the Greek, meaning "near." *Bretti* is in honor of the E. Bardon's great grandmother, Helen Brett.

Aleiodes (*Tetrasphaeropyx*) *paracatherinensis* Fortier new species

Female.— **Body color**: yellow-orange except ocellar triangle black, legs yellow-orange, wings slightly infumate, stigma bicolored, yellow basally, brown apically, veins honey-brown. **Body length**: 4.2 mm, wing length: 3.7 mm. **Head**: antennae missing on holotype specimen, malar space long, 1.6 basal width of mandible and 0.6 eye height; temple broad, about 0.8 of eye width; occipital carina complete at vertex; oral space small, horizontal width about equal to basal width of mandible; clypeus broad, medial height about equal to medial height of oral opening; ocelli small, ocell-ocular distance about 1.8 diameter of lateral ocellus; face shallowly, faintly areolate over a coriaceous surface, frons with weak carinae; vertex with heavy transverse costae; temples coriaceous, receiving terminal ends of costae from vertex. **Mesosoma**: anteromedial section of pronotum steeply declivous, pronotum bisected on each side by sulcus dividing each side into dorso-lateral and ventro-lateral areas, dorso-lateral areas rugose-shiny, ventrolateral areas rugulose-coriaceous; scutum rugulose-coriaceous, notauli deeply impressed, without scrobiculation, postero-medial area strongly rugulose-shiny; scutellar disc foveolate; mesopleuron rugulose in subalar sulcus, rugose posterior of subalar sulcus and over anterior portion of central disc, extreme posterior area of central disc nitid, mesopleuron rugose posterior to central disc, precoxal sulcus concave, rugulose; propodeum areolate-rugose, steeply, abruptly declivous in posterior ½, median carina complete. **Legs:** tarsal claws pectinate basally only, length of inner spurs of hind tibiae about 0.3 length of hind basitarsi; hind coxae irregularly foveolate-areolate and shiny. **Wings:** forewing with vein r about 0.7 of length of 3RSa and about equal to m-cu, second submarginal cell rectangular, 1CUa short, about 0.2 length of 1CUb; hind wing with vein RS not tubular, slightly recurved, marginal cell narrowest in middle, 1r-m about 0.6 length of 1r-m, 1M about 0.6 length of 1M+CU, m+cu present, pigmented, about 0.7 length of 1r-m. **Metasoma:** tergite I heavily rugose-shiny; tergite II heavily rugocostate-shiny; tergite III areolate; tergite IV densely foveolate, deep carapace completely covering remaining tergites, internal angle of curvature less than 90°, narrow flange along entire ventral margin; ovipositor about 0.5 of hind basitarsus.

Male.—unknown.

Holotype.— female: USA, MINNESOTA: Ramsey Co. Saint Paul, University Farm. Light Trap, July 23, 1935. A. A. Granowsky, coll. Deposited in UMSP.

Biology.—Unknown.

Distribution.—Known only from type locality in Saint Paul, MN, USA.

Comments.—An all-orange species with heavily, densely rugulose metasoma, except tergite IV densely foveolate. The only other species with the combination of 1) similarly sculptured metasoma 2) entirely yellow-orange soma excluding appendages, and 3) metasomal tergite IV a deep carapace such that internal angle of curvature is less than 90° is *A. catherinensis* Fortier. This species may be distinguished from that latter as follows: 1) lighter, yellow-orange coloration in contrast to dark orange coloration in the latter; 2)

stigma bicolored yellow and brown, in contrast to entirely black in the latter; and 3) legs yellow-orange in contrast to black in the latter.

Etymology.—The species name refers to the close similarity of this species with *A. catherinensis*. "*Para*" is from the Greek, meaning "beside," and *catherinensis* refers to the type location of *A. catherinensis*, on Saint Catherine's Island, Georgia.

Aleiodes (*Tetrasphaeropyx*) *paracopiosus* Fortier new species

Female.—**Body color:** entirely yellow-orange except black inter-ocellar triangle, black antennae, often with irregular black blotches on metasomal tergites, sometimes on mesosoma; tarsi with black; wing veins yellow, stigma variable, usually bicolored, darker apically, yellow basally, often entirely yellow. **Body length:** 3.6-4.0 mm; forewing length: 3.1-3.8 mm, usually closer to 3.1mm. **Head:** ocelli large, ocell-ocular distance usually 0.3-0.4 length of longest diameter of lateral ocellus, 38-39 flagellomeres, all distinctly longer than wide; malar space short, 0.6-1.0 width of mandibular base and 0.2 length of eye height; clypeus weakly swollen, clypeus medial height 0.8-1.0 length of oral space medial height; oral space small, circular, horizontal diameter 0.8-1.0 width of mandibular base; occipital carina incomplete at vertex; face coriaceous. **Mesosoma:** pronotum transversely bisected on each side by weakly scrobiculate sulcus, shiny-rugulose dorso-laterally; mesoscutum coriaceous, notauli either with weak, sparse scrobiculation or with none, notauli terminating at antero-lateral corners of postero-medial rugose area; mesopleuron with broadly defined precoxal sulcus, usually antero-posteriorly elongate, coriaceous with faint carinulae, coriaceous in area surrounding steraulus, costate ventral to subalar sulcus, sparse punctation on anterior surface of central disc; propodeum with fine, shallow rugulo-areolation, postero-lateral tubercles present, not prominent, median carina complete. **Legs:** tarsal claw length greater than half the width of apical tarsomere apex, not pectinate apically, dorsal surface of hind coxae coriaceous. **Wings:** forewing vein r 0.5-0.7 length of 3RSa, second submarginal cell trapezoidal, vein 1CUa short, length 0.1-0.25 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest in middle, vein 1r-m 0.6 length of 1M, 1M 0.7 length of M+CU, vein m-cu an unpigmented fold, 0.5-0.6 length of 1r-m. **Metasoma:** tergites I and II finely, shallowly rugulo-costulate to more boldly rugocostate; tergites III and IV finely, shallowly rugulose-areolate; tergite IV a complete carapace covering apical tergites, interior angle of curvature of carapace about 90°, ventral flange complete apically, usually not recurved apically.

Male.—unknown; possibly indistinguishable from males of *A. copiosus*.

Holotype.—female: USA: TEXAS, Ward Co., 21 mi. E. Pyote, September 17, 1975, R. Wharton. Deposited in TAMU.

Paratypes.—(all females): USA: ARIZONA, Tucson, Pima Co., June 27, 1965, R. & J. Matthews; USA: TEXAS, Shelby Co., Sabine National forest, Snyder's Boat ramp, July 29, 1975, J. S. Ashe; USA, TEXAS, Jeff Davis Co., Ft. Davis, Limia Cn., 5000 ft., May 31, 1959, W. R. M. Mason; MEXICO: NUEVA LEON, Monterrey, 5 mi., S., July 9, 1963, H. F. Howden; MEXICO: NUEVA LEON, near Monterrey, Chipinique Mesa, 5400 ft., July 29, 1963, H. & A. Howden; MEXICO: BAJA CALIFORNIA, Arroyo Miramar, 4km. NW, Las Barracas, November 7, 1982, Griswold, Irwin, Schlinger; USA: TEXAS, Culberson Co., 3 mi. E. Van Oorn, August 12, 1969, at light, Board & Hafernik; USA: TEXAS, Bexar Co., San Antonio, June 25, 1938, D. W. Craik; USA:ARIZONA, Pima Co., Sabino Cyn., September 1, 1963, V. L. Vesterby. All paratypes deposited in TAMU.

Biology.—host unknown.

Comments.—This species appears to be a sibling species with *A. copiosus*. It is sympatric with that species, and like *A. copiosus* it is relatively common in collections in comparison to other *A.* (*Tetrasphaeropyx*) species. It may be distinguished from *A. copiosus* by its smaller ocelli, with longest diameter of lateral ocellus 1.5-3.0 length of ocell-ocular distance, in contrast to 4.0 or greater than length of

ocell-ocular distance in *A. copiosus*, and by its bolder tergite sculpturing.

Etymology.—The specific name refers to the close similarity of this species with *A. copiosus* in both overall morphology and in relatively large numbers in collections.

Aleiodes (*Tetrasphaeropyx*) *paraluhmani* Fortier new species

Female.—Body color: head entirely yellow-orange except black inter-ocellar triangle, black antennae, 3rd – 5th maxillary palpomeres from base brown, labial palps brown; prothorax, mesoscutum, and scutellum entirely yellow-orange; mesopleuron bicolored, yellow-orange dorsally and black ventrally; metapleuron bicolored; propodeum bicolored; metasoma black except yellow-orange patches laterally on each tergite and extensive yellow-orange coloration in apical half of tergites II and IV; legs nearly entirely yellow-orange except black tarsi; wings infumate, stigmas and wing veins dark brown. Body length: 4.5 mm. forewing length: 3.8 mm. Head: ocelli tiny, ocell-ocular distance 2.2 length of longest diameter of lateral ocellus; vertex coriaceous-punctate; 40 flagellomeres, nearly all apparently about as wide as long, width:length ratio 0.8-0.9; malar space long; eyes small, malar space 0.6 length of eye height and 1.8 width of mandibular base; oral space small and round, clypeus medial height 0.8 length of oral space medial height, oral space horizontal diameter 1.2 width of mandibular base; occipital carina incomplete at vertex; face coriaceous, strigulate in dorsal half. Mesosoma: pronotum bisected on each side by transverse scrobiculate sulcus; pronotum coriaceous ventro-laterally, shiny-minutely rugulose dorso-laterally; mesoscutum coriaceous, notauli scrobiculate in anterior 0.25, terminating at lateral edges of postero-medial weakly rugulose-coriaceous area; scutellum coriaceous; mesopleuron without a precoxal sulcus, coriaceous; propodeum coriaceous-rugulose, shallowly impressed, median carina complete. Legs: tarsal claw length greater than 0.5 width of apex of apical tarsomere, without pectination apically, dorsal surfaces of metacoxae coriaceous-weakly rugulose. Wings: infumate, forewing vein r 0.6 length of 3RSa, second submarginal cell rectangular, vein 1CUa short, 0.2 length of 1CUb; hind wing vein RS slightly sinuate, marginal cell narrowest at middle, 1r-m 0.5 length of 1M, 1M 0.7 length of M+CU, m+cu pigmented, 0.8 length of 1r-m. Metasoma: tergites I and II shallowly, finely rugulocostulate, tergite II with longitudinal costae more prominent than in tergite I; tergites III and IV shallowly, finely rugulose, tergite IV a shallow carapace entirely covering apical tergites, internal angle of curvature about 135°, without a well defined recurved flange.

Male.—Unknown.

Holotype.—Female: USA, WISCONSIN, Burnett Co., Grantsburg, Johnson Rd., Malaise, IV-27-1999, M. Saborin, coll. Deposited in UMSP.

Biology.—unknown.

Distribution.—known only from type locality in northwestern Wisconsin.

Comments.—A bicolored wasp with bright yellow-orange head, mesoscutum, and legs, otherwise mostly black with infumate wings and shallow, relatively undeveloped carapace that nonetheless covers all apical tergites. This species can be distinguished from its closely similar sibling species *A. luhmanus* as follows: 1) mesopleuron yellow-orange in entire dorsal half, black ventrally, in contrast to nearly entirely black except small yellow-orange patch dorsal of mesocoxal articulation in latter species; 2) metasomal tergites II and IV black basally with yellow orange patches laterally on tergites, and extensively yellow-orange in apical half, in contrast to tergites II and IV entirely black in apical half in the latter species; 3) forewing second submarginal cell elongate-rectangular in contrast to short and square in the latter species; and 4) forewing vein 1CUa shorter, 0.2 length of 1CUb, in contrast to longer vein 1CUa, 0.3 length of 1CUb in the latter species.

Etymology.—The specific name is after Dr. John Luhman of the University of Minnesota, ichneumonid systematist and biological control scientist.

Aleiodes (*Tetrasphaeropyx*) *parareolatus* Fortier
new species

Female.—**Body color**: nearly entirely yellow-orange except antennal flagellomeres black; propodeum black; metasomal tergites III and IV washed with black; legs light brown; wing veins dark honey yellow, stigma bicolored, brown except yellow in basal corner. **Body length**: 3.8 mm; *forewing length*: 3.2 mm. **Head**: ocelli medium, longest diameter of lateral ocellus 0.9 length of ocell-ocular distance; more than 30 flagellomeres, all distinctly longer than wide; malar space long, 2.2 width of mandibular base and 0.5 length of eye height; occipital carina complete at vertex; oral space small, circular, 1.1 length of clypeal medial height, horizontal diameter 0.8 width of mandibular base; face foveolate over a coriaceous surface; frons coriaceous; vertex coriaceous. **Mesosoma**: pronotum shelf-like anteriorly, each side bisected by weakly scrobiculate sulcus, coriaceous-rugulose ventro-laterally, shiny dorso-laterally; mesoscutum medial lobe coriaceous, lateral lobes coriaceous-foveolate; mesopleuron with small, well-defined precoxal sulcus, mesopleuron foveolate antero-dorsally; propodeum rugocostate, steeply declivous posteriorly, median carina complete. **Legs**: tarsal claws small, hind tarsal claws not extending to tarsal apex; hind coxae foveolate dorsally. **Wings**: forewing with vein r short, 0.5 length of 3RSa and 0.6 length of m-cu; second submarginal cell elongate-rectangular, vein 1CUa short, 0.25 length of 1CUb; hind wing with vein RS slightly recurved, narrowest at middle, vein 1r-m short, 1M long, 1r-m 0.5 length of 1M, 1M 0.8 length of M+CU, vein m+cu present as an unpigmented fold, 0.6 length of 1r-m. **Metasoma**: tergite I rugose-areolate; tergite II rugose-areolate medially, tergites III-IV foveate-areolate, tergite IV a complete carapace over apical tergites, internal angle of curvature less than 90°, ventral flange complete, slightly recurved apically.

Male.—Esentially as in female.

Holotype.—Female: USA: OREGON, Harney Co., Burns, Elevation 4149', July 28, 1961, G. L. Bush, coll. Deposited in NMNH.

Paratype.—Male: USA: OREGON, Lake Co., Alkali Lake, July 21, 1954, S. L. Heydon, coll. Deposited in UCD.

Distribution.—Known only from type localities in Oregon USA.

Biology.—Unknown.

Comments.—This species is closely similar to *A. areolatus*. It differs from that species as follows: 1) forewing vein r short, 0.5 length oif 3RSa, in contrast to long, 0.8 length of 3RSa in latter species, thus second submarginal cell long, rectangular rather than short, square as in latter species; 2) body relatively bare, not densely pilose with long white setae, in contrast to latter species; 3) medial lobe of mesoscutum coriaceous in contrast to foveolate over a coriaceous surface in latter species, and 4) dorsolateral section of pronotum smooth and shiny, in contrast to foveolate in latter species.

Etymology.—the specific name refers to the close similarity of this species with *A. areolatus*, including with respect to the distinctive areolate metasomal sculpturing.

Aleiodes (*Tetrasphaeropyx*) *paraselu* Fortier
new species

Female.—**Body color**: head and mesosoma yellow-orange except black inter-ocellar triangle, black antennae and palps; bicolored propodeum, black basally, yellow-orange apically; metasomal tergite I yellow-orange laterally, black medially; tergite II black with yellow highlights basally; tergites III and IV black; legs with yellow-orange coxae, trochanters, trochantellae, and femora and with black tibiae and tarsi; wings with veins black anteriorly and basally, becoming pale postero-apically, stigmas black. **Head:** ocelli small, ocell-ocular diameter 1.4 length of longest diameter of lateral ocellus, vertex heavily, densely transversely carinate; 41 flagellomeres, those in basal 0.5 of flagellum apparently about as wide as long, width:length ratio greater than or equal to 0.8; malar space long, 1.5 width of mandibular base and 0.6 length of eye height; oral space small,

clypeus medial height 1.0 length of oral space medial height, oral space horizontal diameter 0.9 width of mandibular base; occipital carina complete at vertex; face coriaceous ventrally, transversely carinate dorsally. **Mesosoma:** pronotum shelf-like antero-medially, each side transversely bisected by a scrobiculate sulcus, heavily, densely rugose-areolate ventro-laterally, shiny-rugose dorso-laterally; mesoscutum rugose-foveolate over coriaceous surface, notauli shallowly impressed, scrobiculate, terminating at lateral edges of postero-medial shiny-rugose area; mesopleuron coarsely sculptured, precoxal sulcus dorso-ventrally costate, central disc nitid, otherwise mesopleuron rugose-foveolate; propodeum heavily rugose, steeply declivous in apical half, median carina complete, wavy in apical half. **Legs:** tarsal claws not pectinate apically, hind coxae foveolate dorsally over coriaceous surface. **Wings:** fore wing with vein r long, about 0.8 length of 3RSa, second submarginal cell trapezoidal, 1CUa long, about 0.4 length of 1Cub; hind wing with vein RS slightly sinuate, marginal cell narrowest in middle, vein 1r-m 0.7 length of vein 1M, vein 1M 0.6 length of M+CU, vein m-cu pigmented, 0.5 length of 1r-m. **Metasoma:** tergite I coarsely, densely rugulose; tergite II with deeply impressed, coarse rugocostate sculpturing; tergite III rugulose; tergite IV foveolate-areolate, a complete, rounded carapace over apical tergites, ventral flange of carapace completely recurved apically, internal angle of curvature less than 90°.

Male.—unknown.

Holotype.—female: USA: TEXAS, Fayette County, LaGrange, April 7 [year unknown], W.R.M. Mason, coll. Deposited in NMNH.

Biology.—host unknown.

Distribution: known only from type locality in southeastern Texas.

Comments.—This species falls within a group of similarly colored species with deep, well developed carapaces and small ocelli, most of which are found in the western and southwestern Nearctic north of Mexico, but one of which is also found in North Carolina. The group also includes *A. citriscutum, A. dorsofoveolatus, A. hiisiis*, and *A. dabai*. This species can be separated from *A. citriscutum* and *A. dorsofoveolatus* by its rugocostate metasomal sculpturing in contrast to the foveate or areolate metasomal sculpturing of the latter 2 species respectively. It can be separated from *A. hiisiis* and *A. dabai* by its extensive foveate mesopleural and metapleural sculpturing. It is closely similar to *A. kisomm*, and can be separated from that species as follows: 1) mesopleuron entirely yellow in contrast to black ventrally n the latter species; 2) shorter forewing vein r and longer second submarginal cell, forewing vein r 0.8 length of 3RSa in contrast to 1.1 in the latter species and second submarginal cell elongate trapezoidal in contrast to square in latter species; 3) shorter metasomal tergite I (width: length = 0.5 in contrast to 0.6 in the latter species); 4) metasomal tergite I sculpturing coarsely rugose, in contrast to evenly rugose-areolate in the latter species; and 5) tergite II rugocostate, in contrast to rugose in the latter species. It appears to be a sibling species of *A. selu*, and may be separated from that species by yellow metasomal venter in contrast to black in *A. selu*, and black metasomal tergite II in contrast to yellow in *A. selu*.

Etymology.—The specific name refers to the close similarity of this species to *A. selu*. The specific name of *A. selu* is from the Cherokee and refers to the Corn Woman in Cherokee cosmic mythology.

Aleiodes (*Tetrasphaeropyx*) *parasquilaxensis* Fortier new species

Female.—**Body color**: head, including antennae and palps entirely black; mesosoma nearly entirely yellow-orange, propleuron and propodeum black; metasoma nearly entirely black, tergites I and II yellow-orange on lateral edges; legs entirely black; wings hyaline, veins and stigmas brown. **Body length**: 4.2 mm; wing length: 3.5 mm. **Head**: flagellae broken; malar space medium in length, 0.4 width of mandibular base and 1.4 length of eye height; oral space small, oral space medial height 1.1 length of clypeus medial height, oral space horizontal diameter 1.0 width of mandibular base; occipital carina incomplete at vertex; ocelli small; ocell-ocular diameter 1.4 length of longest diameter of lateral ocellus; facial sculpturing coriaceous, transverse

carinulae underneath antennal sockets. **Mesosoma**: each side of pronotum transversely bisected by scrobiculate sulcus extensively coriaceous ventro-laterally, shiny-coriaceous dorso-laterally; mesoscutum coriaceous, notauli sparsely, faintly scrobiculate, terminating along lateral edges of postero-medial rugose area; mesopleuron with a shallow, diffusely defined precoxal sulcus, extensively coriaceous, mesopleuron carinate in area beneath subalar sulcus; propodeum shallowly, finely rugulose-areolate, median carina complete. **Legs**: metatarsal claw greater than 0.5 width of apex of apical tarsomere, without apical pectination, dorsal surfaces of metacoxae rugose. **Wings**: forewing vein r 0.70-0.75 length of 3RSa, submarginal cell nearly rectangular, 1CUa medium, 0.30 length of 1CUb; hind wing with vein RS sinuate, marginal cell narrowest at middle, 1r-m 0.6 length of 1M, 1M 0.6 length of M+CU, m+cu pigmented brown, 0.75 length of 1r-m. **Metasoma**: finely densely rugulose, tergites III and IV more finely rugulose than tergites I and II; tergite IV a shallow carapace entirely covering apical tergites, internal angle of curvature of carapace greater than 90°, ventral flange not recurved apically.

Male.—unknown

Holotype.—female: CANADA: BRITISH COLUMBIA, Squilax, 58-5377-04-ii, ex: geometrid *Itame anataria*; emerged IV-27-1959. Deposited in CNC.

Biology.—reared from geometrid *Itame anataria*.

Distribution.—known only from type locality in Squilax, British Columbia, near the Washington State border.

Comments.—This species and its sister-species *A. squilax* Fortier are unique among Canadian *Tetrasphaeropyx* in all black head and legs and extensive bright yellow-orange on mesosoma. This species may be distinguished from *A. squilax* by the following forewing characters: 1) vein r long, greater than 0.8 length of 3RSa, in contrast to vein r 0.70-0.75 length of 3RSa in the latter, and 2) vein 1CUa short, less than 0.2 length of 1CUb, in contrast to 1CUa greater than 0.3 length of 1CUb in the latter species.

Etymology.—The specific name refers to the holotype collection location at Squilax, British Columbia, Canada.

Aleiodes (*Tetrasphaeropyx*) *pilosus* (Cresson 1872)

Rogas pilosus Cresson 1872:189. *Tetrasphaeropyx pilosus*: Ashmead 1888:634. *Rogas pilosus*: Roman 1910:138. *Rogas pilosus* Muesebeck and Walkley 1951:172. *Aleiodes pilosus*: Fortier 2006b:481-482.

Female.— **Body color**: head yellow-orange, mandibles yellow-orange, ocellar triangle black; scapes, pedicels reddish-brown dorsally, yellow-orange ventrally, annelli orange, flagella brown; mesosoma orange to dark orange; metasomal tergites yellow-orange; front and middle legs yellow-orange, tarsi dark orange, hind legs orange except apex of femora black, tibiae black apically, tarsomeres dark orange to brown; wings dusky, forewing veins fainter apically, r-m pigmented, stigma brown except yellow in basal corner, hind wing veins light brown basally becoming darker apically. **Body length**: 4.4 mm, fore wing length: 4.4 mm. **Head**: malar space long, 2.0 of basal width of mandible and 0.6 eye height; temple wide, width about 0.8 eye width; oral space nearly circular, small, horizontal diameter about equal to mandibular basal width; clypeus medial height about 1.1 of medial height of oral space; occipital carina complete medially; 41 flagellomeres, all slightly longer than wide; ocelli small, ocellocular space about 1.1 of diameter of lateral ocellus; face shiny, coriaceous, frons nitid; vertex punctate, temples punctate. **Mesosoma**: pronotum nitid antero-dorsally, ventral flange upturned medially, scrobiculate lateral sulci dividing lateral areas of pronotum into dorsolateral and ventrolateral sections, both sections punctate; scutum densely punctate, notauli finely scrobiculate, scutellar disc foveolate; mesopleuron foveolate except mostly nitid central disc, punctate around periphery of central disc; sternaular area not concave; metapleuron foveolate; propodeum foveolate, median carina complete apically. **Legs**: inner spur of hind tibia about 0.4 length of hind basitarsus, dorsum of hind coxae punctate.

Wings: dusky, vein r long, about 0.9 length of 3RSa and about 1.3 length of m-cu; 1cu-a beyond M by a distance slightly greater than length of 1cu-a, 1CU-a short, about 0.2 of 1CU-b; hindwing RS slightly recurved, marginal cell narrowed medially, M about 1.5 length of 1r-m, M+CU about 1.5 length of 1M, m-cu about 0.6 length of 1r-m and pigmented. **Metasoma**: 1st and 4th tergites foveolate, 2nd and 3rd tergites foveolate-areolate, median carinae complete in first 2, in 3rd tergite terminating in basal 1/2; 4th tergite a rounded, deeply carapace, internal angle of curvature less than 90°, completely covering tergites apical to it, ventral flange pale, very faint sculpturing, recurved along entirety.

Male.— Essentially as in female except propodeum and leg coloration darker yellow-orange coloration than in female.

Holotype.— female: USA: TEXAS, Bosque Co. Collected by Belfrage. Missing head, wings except left forewing. Deposited in NMNH.

Topotype: Male: USA: TEXAS, Bosque Co., 1860-1861. coll. Belfrage. Type no.1626. Deposited in NMNH. missing right antenna and most of left; apices of hind wings frayed. Deposited in ANSP. Other material examined: Female: USA: NEW MEXICO, Eddy Co. 32.38N, 103.86W (Site 5), June 12, 1979, D. R. Delorme and H. L. Carrola colls. Deposited in UCB. Female: USA: TEXAS, Bell Co., Hwy 36, 6 mi. NW Temple, August 23, 1977, coll. R. Psencik. ex: *Fernaldella* larva coll. as 3rd I. Found parasit. September 2. as 4th I. Emerged September 14. Depositied in NMNH. Female: USA: COLORADO, Nederland, Science Lodge, 9500', July 29, 1961, J. R. Stainer. Deposited in NMNH. Female. USA: ARIZONA, Cochise Co., Portal to Ranger Sta., August 6, 1986, S. M. Fondriest coll. Deposited in NMNH. Male. USA: NEW MEXICO, Dona Ana Co., 12 mi. W. Santa Teresa, elev. 1260', 31° 48.80N, 106°54W, August 16, 2000, R. Wharton coll. Deposited in UCB. Male: USA: NEW MEXICO, Dona Ana Co., 12 mi. W. Santa Teresa, elev: 1260', 2000/035, 31.80N, 106.90W, August 16, 2000, Rodriguez, Ohmann, Woolley colls. Deposited in UCB. Male: USA: WYOMING, Chugwater, July 25, 1955, *Tetrasphaeropyx pilosus* (Cress.), det. Mues. Deposited in NMNH.

Biology.—Reared from larvae of geometrid *Fernaldella* sp.

Distribution.—Known from Bosque Co., Texas, Eddy Co., New Mexico, Dona Ana Co., New Mexico, Cochise Co, Arizona, Chugwater Co, Wyoming, and Colorado.

Comments.—This species is similar to *A. oaxacensis* and *A. fernaldellavorax* in extensive punctate to foveolate sculpturing, small ocelli, yellow coloration, and deeply carapace-like metasomal tergite IV with lower edge of ventral flange smooth. It may be distinguished from *A. oaxacensis* by combination of shiny scutum and frons, infumate wings, and second submarginal cell not quadrate. It may be distinguished from *A. fernaldellavorax* by the yellow propodeum in contrast to the propodeum black in the latter species. The three type specimens examined presumably correspond to the three specimens, one female and 2 male, cited by Cresson (1872), and the three specimens cited by Ashmead (1889).

Aleiodes (*Tetrasphaeropyx*) *pooedooa* Fortier new species

Female.—**Body color:** head black except yellow-orange border around eyes; antennae black; mesoscutum bicolored black and yellow-orange or entirely orange; scutellar disc entirely black or mostly yellow-orange; mesopleuron bicolored black and yellow-orange, metapleuron black; propodeum bicolored black and yellow-orange; tergites I and II bicolored yellow-orange with various amounts of black blotching; tergites III and IV yellow-orange; legs mostly yellow-orange, dorsal surfaces of hind tibiae and tarsi black; wing veins brown, stigmas bicolored, yellow basally, brown apically. **Body length:** 4.2 mm; fore wing length 3.2-3.3 mm. **Head:** ocelli small, ocell-ocular distance 1.2-1.4 length of longest diameter of lateral ocellus; 38 flagellomeres, all distinctly longer than wide; malar space long, 1.3-1.4 width of mandibular base, 0.4-0.5 length of eye height; clypeus medial height equal to oral space medial height, oral space small, circular, horizontal diameter 0.8 width of mandibular base; occipital carina complete at vertex; face coriaceous, faint

transverse carinae below antennal sockets. **Mesosoma:** each side of pronotum transversely bisected by scrobiculate sulcus, pronotum shiny-rugose dorso-laterally; mesoscutum coriaceous, notauli scrobiculate along entire length, terminating along lateral edges of postero-medial rugose area; mesopleuron without a precoxal sulcus, extensively coriaceous, rugocostate in area beneath subalar sulcus; propodeum areolate, postero-lateral tubercles present, median carina complete. **Legs:** tarsal claw length greater than 0.5 apical width of apical tarsomere, without pectination apically, dorsal surfaces of metacoxae rugulose-coriaceous. **Wings:** forewing vein r long, 3RSa short, r 0.85 length of 3RSa, second submarginal cell short-trapezoidal, 1CUa less than 0.3 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest at middle, 1r-m short, 0.5 length of 1M, 1M 0.7 length of M+CU, m+cu a non-tubular, unpigmented wing fold, 0.6-0.8 length of 1r-m. **Metasoma:** tergite I rugulose basally becoming rugocostate apically; tergite II rugocostate; tergite III densely rugulocostulate; tergite IV densely, finely rugulose, tergite IV a carapace covering all apical tergites, carapace shallow, interior angle of curvature greater than 90°, ventral flange not recurved apically.

Male.—unknown.

Holotype.—female: USA: CALIFORNIA, Inyo Co., White Mts., Wyman Canyon, near stream, VII-20-1967, S.&S. Frommer, colls. Deposited in UCR.

Paratype.—female: same data as holotype. Deposited in UCR.

Biology.—host unknown.

Distribution.—known only from type locality.

Comments.—This species resembles Canadian species in extensive black on face, small ocelli, well developed precoxal sulcus absent, rugocostate metasomal tergites, and shallow carapace with internal angle of curvature greater than 90°. Its coloration pattern most closely resembles that of *A. provancheri*. It may be distinguished from that species by (1) longer forewing vein r with respect to 3RSa, vein r 0.85 length of 3RSa in this species, in contrast to less than 0.7 in *A. provancheri*, and (2) second submarginal cell short-trapezoidal, in contrast to elongate-rectangular in *A. provancheri*.

Etymology.—The specific name is the Paiute word for 'abalone shell,' and refers to the carapace, or shell-like MT IV of the species. The Paiute People originally inhabited southeastern California, in the vicinity of the type locality.

Aleiodes* (*Tetrasphaeropyx*) *provancheri

Fortier 2007a: 26–27

Female.—**Body color**: face yellow-orange except large black area extending from top of inter-antennal groove along the groove, broadening into large medial patch, running down to and laterally along sides of yellow-orange clypeus; frons black; vertex black except near eyes; temples and genae yellow-orange; antennae black except yellow-orange annellus; pronotum dark anteriorly becoming yellow-orange postero-laterally; propleuron black; scutum black except yellow-orange patches at bases of notauli; scutum dark yellow-orange apical-medially; scutellum black; mesopleuron black except antero-dorsal corner yellow-orange, mesosternum black, propodeum, metapleuron black, first metasomal tergite black except narrow yellow-orange lateral bands, second metasomal tergite with dark brown patch covering most of tergite, yellow-orange laterally and apically, third metasomal tergite yellow-orange along basal edge, otherwise brown on basal third, yellow-orange in apical two-thirds, fourth metasomal tergite yellow-orange, legs yellow-orange except fore coxae black, tarsi with brown, stigma brown, forewings with brown veins except unpigmented (RS+M)b, r-m, and 2RS veins, hind wing veins brown except cu-a unpigmented posteriorly. **Body length:** 4.4 mm; forewing length: 3.4 mm. **Head:** 40 flagellomeres, all slightly longer than wide; malar space long, length 1.8 with of mandibular base and 0.8 length of eye height; temple broad, about 0.9 length of eye width; occipital carina effaced medially at vertex; oral space small, horizontal width slightly smaller than basal width of mandible and about 0.4 length of eye height; clypeus broad, medial height about 0.8 length of

median height of oral space; ocelli small, ocell-ocular distance about 1.7 length of longest diameter of lateral ocellus; face rugulose, median cleft below antennae, frons coriaceous; vertex rugulose; temple rugulose posteriorly, coriaceous anteriorly. **Mesosoma:** pronotum rugose anteromedially, each side with a transverse scrobiculate sulcus dividing pronotum laterally into dorso-lateral and ventro-lateral areas, finely areolate ventro-laterally, costate dorso-laterally; scutum, scutellum weakly, finely rugulose over coriaceous surface, notauli scrobiculate basally becoming rugulose apically, terminating apically in rugose postero-medial area; mesopleuron with rugocostate subalar sulcus, rugulose anteriorly, rugulose in middle, coriaceous antero-ventrally, ventrally, and posteriorly, nitid central disc, sternaular area weakly concave; metapleuron areolate; propodeum heavily areolate-rugose, median carina forked basally, complete. **Legs:** tarsi pectinate basally only; inner spur of hind tibiae about 0.4 of length of hind basitarsi; hind coxae coriaceous dorsally. **Wings:** forewing with vein r about 0.6 of length of 3RSa and about 0.7 of length of m-cu, vein 1cu-a beyond 1M by about the same length as 1cu-a, length of 1CUa about 0.3 of length of 1CUb; hind wing vein RS present as a fold, slightly recurved, marginal cell narrowest at midpoint, vein 1r-m about 0.7 of length of 1M, vein 1M about 0.7 length of vein M+CU, vein m-cu distinct, pigmented, directly posterior to 1r-m. **Metasoma:** tergite I rugose, median carina complete; tergite II entirely rugose, median carina complete, weakly continuous with median carina of tergite III; tergite III rugulose, median carina terminating apically in basal 3/5 of length of tergite; tergite IV finely areolate-rugose, a shallow carapace covering remaining tergites although barely covering fifth tergite, interior angle of curvature of carapace greater than 90°, ventral flange scrobiculate; ovipositor about 0.6 length of hind basitarsus.

Male.—unknown.

Holotype female.—QUEBEC, Mount Albert, near Ste. Anne des Monts, Gaspe Peninsula, 303 miles NE of Quebec, July 12, 1954, W. J. Brown, coll. Deposited in CNC.

Distribution.—Known only from type locality in Quebec.

Biology.—Unknown.

Comments.—Characterized by metasomal color pattern, nearly entirely yellow-orange except tergite I extensively black basally. This species closely resembles *A. argyllaceaerivorax*, and may be distinguished from the latter by its coarsely rugose propodeum, in contrast to propodeum finely, shallowly rugose in the latter.

Etymology.—Named after Leon Provancher, eminent 19th century Quebecois naturalist and entomologist, founder of *Le Naturaliste*, the first North American-published French natural history periodical, and founder of Provancher's collection of insects, held in the Quebec Provincial Museum.

Aleiodes (*Tetrasphaeropyx*) *pseudoanatariatus* Fortier new species

Male.—**Body color:** head orange except black antennae and palpi, interocellar space, vertex; pronotum bicolored orange and brown; propleuron brown; mesoscutum brown except notauli yellow; scutellar disc orange in middle rimmed with black; mesopleuron orange laterally, venter black; metapleura, propodeum black; metasomal tergite I black except apical edge yellow-orange; tergite II yellow-orange; tergites III, IV black; forelegs and middle legs orange, hind legs orange washed with brown on coxae, trochanters, dorsa of apical halves of femora, and dorsa of tibiae, tarsi; wings hyaline, veins dark brown, stigma bicolored, yellow basally, black apically. **Body length**: 4.6 mm; fore wing length 3.6 mm. **Head:** ocelli medium, ocell-ocular distance 0.9 length of largest diameter of lateral ocellus; 44 flagellomeres, all flagellomeres clearly longer than wide; malar space long, 1.5 length of basal width of mandible, 0.5 length of eye height; clypeus weakly swollen, oral space small, circular, horizontal width equal to basal mandibular width; occipital carina complete at vertex; face coriaceous. **Mesosoma**: pronotum transversely bisected by scrobiculate sulcus on each side, pronotum shelf-like medially, with costulae ventro-laterally, shiny-rugose dorso-laterally; mesoscutum punctate over coriaceous surface, notauli scrobiculate, terminating posteriorly at lateral edges of

postero-medial rugose area; mesopleuron with well defined precoxal sulcus, precoxal sulcus with fine carinulae over coriaceous surface, mesopleuron weakly foveolate anteriorly; propodeum rugose, tubercles slightly protruding posteriorly, median carina complete. **Legs:** tarsal claws very small, length less than apical tarsomere width, not pectinate apically, dorsal surfaces of hind coxae shiny-foveolate. **Wings:** forewing vein r 0.75 length of 3RSa, second submarginal cell short-trapezoidal, vein 1cu-a slightly apical of M, 1CUa short, 0.2 length of 1Cub; hind wing vein RS slightly sinuate, marginal cell narrowest at middle, vein 1r-m 0.75 length of 1M, 1M 0.6 length of M+CU, vein m-cu tubular, pigmented, 0.7 length of 1r-m. **Metasoma:** metasomal tergite I heavily rugocostate, prominent longitudinal costae posteriorly; tergite II densely rugulose, tergite III heavily rugose-areolate; tergite IV heavily areolate, a complete, though shallow carapace over apical tergites, internal angle of curvature slightly less than 90º, ventral flange not completely recurved apically.

Female.—unknown.

Holotype.—male: USA: CALIFORNIA, Yolo Co., 4 mi. W. Winters, June 8, 1991, B. Scaccia. Deposited in UCD.

Biology.—host unknown.

Comments.— A mostly black species with an orange metasomal tergite II and coarse metasomal sculpturing. This species resembles *A. anatariatus*. It can be distinguished from *A. anatariatus* by the following: 1) no black marking on face, ocell-ocular distance with no black, in contrast to the latter with black on face and ocell-ocular distance; 2) ocelli medium, longest diameter of lateral ocelli longer than ocell-ocular distance, in contrast to ocelli small, longest diameter of lateral ocellus shorter than ocell-ocular distance in the latter; 3) mesoscutum and mesopleuron punctate and foveolate respectively in contrast to mesoscutum coriaceous and mesopleuron coriaceous-carinate in the latter; 4) precoxal sulcus well defined in contrast to poorly defined in the latter; 5) hind coxae shiny-foveolate, in contrast to rugulose in the latter; 6) second submarginal cell almost square in contrast to elongate rectangular in the latter, and 7) tergite IV forming a carapace with internal angle of curvature less than 90º, in contrast to tergite IV a shallow carapace with internal angle of curvature greater than 90º in *A. anatariatus*.

Etymology.—The specific name refers to this species' overall similarity to *A. anatariatus*.

Aleiodes* (*Tetrasphaeropyx*) *quickei

Fortier 2007a 27–28

Female.—**Body color**: Body nearly uniformly yellow-orange, pronotum and metasomal tergites I and II paler yellow; antennal flagellomeres dark brown, scapes and pedicels yellow; mouthparts yellow; inter-ocellar triangle dark orange, inner borders of ocelli black; legs yellow except for dark orange hind tarsi; wings hyaline, stigmas mostly yellow except wide brown border along marginal cell; forewing veins except costal vein pale yellow basally becoming brown apically except forewing vein (RS+M)b and r-m unpigmented; hind wing veins pale except 1r-m and R brown; R1 dark apically. **Body length**: 4.6 mm, wing length 3.8 mm. **Head**: malar space short, 0.9 length of basal width of mandible and 0.25 length of eye height; temple narrow, 0.4 width of eye; oral opening nearly circular, small, horizontal diameter 0.8 length of malar space; clypeus broad, medial height 1.2 length of medial height of oral space; occipital carina incomplete medially; face coriaceous, punctate in dorsomedial area; frons coriaceous; vertex rugulocostate, costae running transversely; 40 flagellomeres, all slightly longer than wide; ocelli large, ocellocular space 0.3 length of diameter of lateral ocellus. **Mesosoma**: pronotum coriaceous antero-medially, small elevations corresponding to setal bases, each side of pronotum with transverse scrobiculate sulci separating each side into dorso-lateral and vento-lateral areas, ventro-lateral area rugulocostulate, dorso-lateral area rugulose-areolate; scutum finely areolate-rugulose over coriaceous surface, often with median longitudinal stripe of scrobiculate sculpturing, notauli scrobiculate becoming confluent with rugulose posterior region apically; scutellum coriaceous; mesopleuron

costate antero-dorsally, central disc coriaceous anteriorly, nitid posteriorly, sternaular area concave, coriaceous; metapleuron coriaceous; propodeum with few rugae over coriaceous surface basally, rugulose apically, postero-lateral protuberances sometimes well defined, median carina complete. **Legs**: tarsal claws with basal pectination only, inner spur of hind tibia 0.3 length of hind basitarsus, hind coxae rugulose-costulate dorsally. **Wings**: hyaline, second submarginal cell trapezoidal, not elongate, vein r 0.6 of 3RSa, 0.9 of m-cu, 1cu-a beyond 1M by a distance of 0.8 lengthof 1cu-a, 1CUa short, 0.2 length of 1CU-b; hind wing RS slightly recurved, marginal cell narrowed medially, 1M 1.7 of 1r-m, M+CU 1.6 of 1M, m-cu unpigmented, 0.8 of r+m**. Metasoma**: tergites I, II, and III rugulocostulate, median carinae complete, tergite III with costulation more dense than tergites I and II; tergite IV finely areolate-rugulose, a carapace covering apical tergites, internal angle of curvature about 90°, ventral flange well defined, recurved, entirely scrobiculate; ovipositor length 0.8 length of hind basitarsus. Body and legs extensively covered with pubescence of white setae.

Male.— Essentially as in female.

Holotype.—Female: USA: TEXAS, Hildago County, Bentson-Rio Grande State Park, May 8, 1991, T. Carlow and E. Riley at UV light. Deposited in TAMU.

Paratypes.—10 Females: USA: TEXAS, Kenedy Co. Kenedy Ranch, April 21, 2001, Wharton. 1 Female: USA: TEXAS: Dimmit Co., Chaparral Wildlife Mgt. Area, September 30, 1989, at light, J. C. Schaffner. 1 Female: USA: TEXAS: Kenedy Co., Kenedy Ranch, Jaboncillos Pasture, dune area, April 21, 2001, 27.02N, 97.72W. 1 Female: USA: TEXAS, Hidalgo Co., Bentsen-Rio Grande Valley St. Pk. April 21, 1984, L. G. & T. P. Friedlander. 1 Female: NEW MEXICO: Eddy Co. 32.12N, 103.8W (Site 7), July 15-16,1979, at light, Delorme, McHugh, Schaffner. 1 Male: USA: TEXAS, Bee Co. Beeville, June 11, 1953. University of Kansas Mexico expedition. 1Male, TEXAS: Kenedy Co., Kenedy Ranch, April 21, 2001, Wharton at light. 1 Male: USA: TEXAS, Kenedy Co., Kenedy Ranch, Jabocillos Pasture, dune area, April 21, 2001, 27.02N, 97.72W. All paratypes deposited in TAMU.

Distribution.—Besides the type locality in Hidalgo Co., Texas, also known from Texas counties Kenedy, Dimmit, and Bee, and Eddy Co., New Mexico.

Biology.—Unknown.

Comments.—A nearly all-yellow wasp with large ocelli and fine sculpturing, similar to *A. copiosus and A. paracopiosus* except for the following characteristics which distinguish it from the latter: 1) nearly white coloration on metasomal tergite II and also on the metasomal sterna, in contrast to yellow-orange or tan on those tergites in the latter species; never with irregular black mottling on various metasomal tergites or various mesosomal sclerites, in contrast to the latter species commonly with such coloration.

Etymology.—Named after Donald L. J. Quicke, Fellow in Hymenoptera studies, author of *Parasitic Wasps*, 1997, Chapman & Hall, London.

Aleiodes (*Tetrasphaeropyx*) *quiniguanus* Fortier new species

Female.—**Body color:** entirely yellow-orange except black inter-ocellar triangle, dark brown antennal flagella, irregular black marks on metasoma; dorsal surface of tibiae and tarsi brown; wings hyaline, forewing vein C+SC+R and stigma except basal yellow corner dark brown, other venation pale yellow basally, light brown apically; hind wing veins pale yellow. **Body length:** 3.3 mm. forewing length: 2.8 mm. **Head:** ocelli large, ocell-ocular distance 0.6 length of longest diameter of lateral ocellus; 36 flagellomeres, all distinctly longer than wide; malar space 1.2 width of mandibular base and 0.3 length of eye height; clypeus median height equal to oral space median height; oral space small and circular, horizontal diameter equal to width of mandibular base; occipital carina incomplete at vertex; face coriaceous. **Mesosoma:** pronotum with each side transversely bisected by a scrobiculate sulcus, pronotum shiny-rugulose dorso-laterally; mesoscutum coriaceous, notauli shallowly impressed, terminating posteriorly at antero-lateral corners of postero-median

rugulose area; mesopleuron with shallowly concave, poorly defined coriaceous sternaular area, mesopleuron coriaceous except rugose area ventral to subalar sulcus and posterior of otherwise nitid central disc; propodeum shallowly, finely rugulose, median carina entire. **Legs:** tarsal claws small, length 0.5 apical width of apical tarsomere, dorsal surface of hind coxae finely rugulose. **Wings:** hyaline, forewing vein r short, 0.4 length of 3RSa, second submarginal cell trapezoidal, vein 1CUa 0.3 length of 1CUb; hind wing with vein RS slightly sinuate, marginal cell narrowest at middle, 1r-m 0.5 length of 1M, 1M 0.6 length of M+CU, and m+cu a wing crease, 0.8 length of 1r-m. **Metasoma:** tergite I heavily rugocostate, tergite II rugose; tergites III-IV tightly rugulose, tergite IV a carapace covering apical tergites, interior angle of curvature 90°, ventral flange wide, complete apically, recurved apically.

Male.—unknown.

Holotype.—female: MEXICO: NUEVA LEON, Monterrey, 5 mi. S., VI-14-1963, H. F. Howden, coll. Deposited in TAMU.

Biology.—host unknown.

Distribution.—known only from holotype location in Nueva Leon.

Comments.—This species somewhat resembles *A. areolatus* in extensive yellow coloration, heavily sculptured metasomal tergites I –II, and southwestern locale. It may be disinguished from that species by its large ocelli and absence of well-defined areolae on tergite II in the *A. areolatus* female.

Etymology.—The specific name refers to the language–group, Quinigua, spoken by the former aboriginal people who inhabited what is now Nueva Leon, Mexico.

Aleiodes reisi

Fortier and Sherman 2008: 447-448

Female.— **Body color**: head yellow-orange except black inter-ocellar triangle; antennae black, prothorax yellow-orange; mesoscutum bicolored, yellow-orange except black on lateral lobes; scutellum yellow-orange; mesopleuron yellow-orange except vertex also with black; metapleuron bicolored with black; propodeum almost entirely black except yellow in postero-lateral corners; metasomal tergite I yellow with a pair of black spots, one on each side of median carina; tergite II entirely yellow; tergite III black except yellow along basal and lateral edges; tergite IV entirely black; forelegs yellow orange basally, tibiae infumate, tarsi black, middle and hind legs yellow-orange basally, apices of femora black, tibiae and tarsi entirely black; wings lightly infumate, veins yellow at wing base, otherwise veins and stigmas black. **Body length**: 4.1 mm. Forewing length: 3.1 mm. **Head**: ocelli medium sized, ocell-ocular distance 1.1 length of longest diameter of lateral ocellus; 42 flagellomeres, all distinctly longer than wide, all with width: length ratio less than 0.8; malar space short, 0.9 width of mandibular base and 0.35 length of eye height; oral space small, vertically oblong, clypeus medial height 0.9 length of oral space medial height, oral space horizontal diameter 0.95 width of mandibular base; occipital carina incomplete at vertex; face coriaceous. **Mesosoma:** each side of pronotum transversely bisected by scrobiculate sulcus; pronotum coriaceous-carinate ventro-laterally, coriaceous dorso-laterally; mesoscutum coriaceous, notauli scrobiculate, terminating at lateral edges of posterior-medial rugose area; mesopleuron with a faintly convex, vaguely defined sternaular area, mesopleuron coriaceous; propodeum rugose-areolate, median carina complete. **Legs:** tarsal claws without apical pectination, dorsal surfaces of metaxocae coriaceous. **Wings:** forewing vein r 0.7 length of 3RSa, second submarginal cell trapezoidal, 1CUa 0.36 length of 1CUb; hind wing vein RS slightly sinuate, marginal cell narrowest at middle, 1r-m 0.6 length of 1M, 1M 0.6 length of M+CU, m+cu pigmented, 0.7 length of 1r-m. **Metasoma:** tergites I and II rugocostate, tergites III and IV densely, finely rugulocostulate, tergite IV a shallow carapace, internal angle of curvature greater than 90°, not entirely covering apical tergites.

Male.—As in female except with more extensive black coloration on mesopleuron, scutellum, propodeum, and metasoma. In contrast to metasomal tergite I mostly yellow in the female, the male tergite I is entirely black, and heavily rugocostate in contrast to shallowly rugocostate in the female.

Holotype.—*female*: USA: MISSOURI, Crawford County, Reis Biological Station, Sweep of *Juniperus virginianus*, June 21, 2007, J. Fortier, coll. Deposited in NMNH.

Paratype.—male: USA: MISSOURI, Crawford County, Reis Biological Station, 37.95 N, 91.17W, reared from geometrid *Macaraia multilinea* that had been collected from *Juniperus virginianus* (Eastern Red Cedar) on June 23, 2007. Wasp emerged before August 15, 2007. Deposited in NMNH.

Distribution.—Known only from type locality in Crawford County, Missouri.

Biology.—Reared from geometrid *Macaraia multilineata* collected from *Juniperus virginianus*.

Comments.—This species resembles *A. kohook* in coloration, ocellar size, coriaceous mesopleuron sculpturing, and rugo-costate metasomal sculpturing. It may be distinguished from that species as follows: 1) wings slightly infumate in contrast to hyaline in *A. kohook*; 2) hind wing veins black, in contrast to honey yellow in the latter; 3) hind wing vein m+cu pigmented in contrast to not pigmented in the latter; 4) pronotum steeply declivous anteriorly and not shelf-like, in contrast to shelf-like in the latter; 5) tergite IV not covering tergites apical to it.

Etymology.—The specific name commemorates Fr. Raymond Reis, S.J., who was on the faculty of Saint Louis University between 1945 and 1985, and for whom the holotype location site, Reis Biological station, is named.

Aleiodes (*Tetrasphaeropyx*) *sarceei* Fortier new species

Female.—**Body color:** head nearly entirely black except eye with yellow-orange anterior border; antennae black; palps dusky orange; mesosoma entirely black; metasoma nearly entirely black except tergite II yellow-orange in basal 1/2; forelegs nearly entirely yellow-orange except femora brown apically and tarsi brown, middle and hind legs yellow-orange basally, brown-black femoral apices, brown-black tibiae and tarsi; wings hyaline, veins pale yellow basally and apically, brown medially, stigmas brown. **Body length:** 4.9 mm; forewing length: 4.0 mm. **Head:** ocelli medium, ocell-ocular diameter 1.2 length of longest diameter of lateral ocellus; 40 flagellomeres, all distinctly longer than wide, width/length ratio of each less than 0.8; malar space short, 1.3 width of mandibular base and 0.4 length of eye height; oral space small, circular, median height of clypeus 0.9 length of oral space median height, oral space horizontal diameter 0.9 width of mandibular base; occipital carina narrowly incomplete at vertex; face coriaceous. **Mesosoma:** pronotum steeply declivous anteriorly, bisected on each side by scrobiculate sulcus, pronotum coriaceous ventro-laterally, shiny with faintly defined areolation dorso-laterally; mesoscutum coriaceous, notauli scrobiculate, terminating posteriorly at antero-lateral edges of postero-medial longitudinally carinulate area; propodeum rugulose-areolate, median carina complete. **Legs:** tarsal claw length greater than 0.5 apical width of apical tarsomere, without pectination apically; dorsal surfaces of metacoxae coriaceous. **Wings:** forewing vein r 0.7 length of 3RSa, second submarginal cell short-trapezoidal, 1CUa 0.32 length of 1CUb; hind wing vein RS sinuate, marginal cell narrowest at middle, 1r-m 0.5 length of 1M, 1M 0.7 length of M+CU; m+cu an unpigmented wing-fold 0.7 length of 1r-m. **Metasoma:** tergite I rugocostate; tergite II shallowly rugulocostate; tergites III-IV rugulose, tergite IV a shallow carapace covering all apical tergites, internal angle of curvature greater than 90°, ventral flange indistinctly demarcated, not recurved.

Male.—essentially as in female except metasomal tergite II rugose, not rugocostate as in female, and entirely black, in contrast to black basally and yellow-orange apically as in female.

Holotype.—Female: CANADA: ALBERTA, Cherry Grove, #A3660A, November 2, 1952, FIS 1951, ex: geometrid *Semiothisa granitata*. Deposited in CNC.

Paratypes.—Male: CANADA: QUEBEC, Kasubazua, November 26, 1934, G.S. Walley, coll., ex: geometrid *Itame brunneata* Thun. Deposited in CNC. Male: CANADA, ONTARIO, Mer bleue, June 3, 1937, G.E. Shewell & A.R. Brooks, colls. Deposited in CNC.

Biology.—Reared from geometrids *Semiothisa granitata* and *Itame brunneata*.

Distribution.—known from type localities in Alberta, Ontario, and Quebec, Canada.

Comments.—This species is superficially similar to 2 other northern species with extensive black body coloration and nearly entirely yellow-orange legs: *Aleiodes secwepemc* and *A. cartwrightensis*. It may be distinguished from these species by the following: 1) larger ocelli such that ocell-ocular distance is less than 1.3 length of longest diameter of lateral ocellus, in contrast to 2.0-2.2 of that length in the latter 2 species; vertex posterior of ocelli coriaceous, without well developed carinae, in contrast to heavily rugose in latter 2 species; 3) mesopleuron coriaceous below subalar sulcus, in contrast to rugose in latter 2 species; 4) metasomal tergite II yellow apically, in contrast to entirely black in the latter 2 species.

Etymology.—The specific name refers to the Sarcee People who spoke a dialect of Athapaskan and lived in the area surrounding the present location Cherry Grove, Alberta.

Aleiodes (*Tetrasphaeropyx*) *secwepemc*

Fortier 2007b: 10-11

Female.—**Body color**: head bicolored, yellow-orange except as follows: black above clypeus; frons and vertex black; posterior areas of temples and genae with wide black posterior border; antennae black; maxillary glossae and galeae black; pronotum bicolored with black; mesoscutum black except yellow spots at bases of notauli; tegulae yellow; mesopleuron black except yellow-orange dorsal to subalar sulcus; metapleuron, propodeum black; metasomal tergites I and II mostly black except yellow-orange laterally, tergites III and IV black basally, otherwise yellow-orange; legs entirely yellow-orange, wing veins, stigmas dark honey amber. **Body length**: 4.4 mm; forewing length: 3.8 mm. **Head**: Ocelli small, ocell-ocular distance 2.2 length of longest diameter of lateral ocellus; 42 flagellomeres, all distinctly longer than wide; malar space long, 1.4 width of mandibular base and 0.6 length of eye height; clypeus swollen, medial height 0.8 length of oral space height; oral space small, circular, horizontal diameter equal to width of mandibular base; occipital carina complete at vertex; face rugulose. **Mesosoma**: pronotum not shelf-like medially, transverse scrobiculate sulci mid-laterally, costate ventro-laterally; mesoscutum rugulose over coriaceous surface, notauli weakly scrobiculate, terminating at antero-lateral corners of postero-medial rugulose area; mesopleuron with precoxal sulcus shallowly defined, smooth, sparsely rugulose, mesopleuron rugulose around precoxal sulcus, rugulose below subalar sulcus; propodeum finely rugulose-areolate with elongate setae, prominent postero-lateral tubercles, median carina complete. **Legs**: tarsal claws with length greater than 0.5 width of apical tarsomere apex, not pectinate apically, dorsal surface of metacoxae rugose with long setae. **Wings**: forewing with vein r 0.5 length of 3RSa, second submarginal cell rectangular, nearly square, vein 1CUa 0.3 length of 1Cub; hind wing RS slightly sinuate, marginal cell narrowest in middle, vein 1r-m 0.6 length of 1M, 1M 0.5 length of M+CU, vein m+cu pigmented, tubular, 0.7 length of 1r-m. **Metasoma**: metasomal tergites I and II densely rugulocostulate; tergites III and IV finely rugulocostulate to rugulose, tergite IV a shallow carapace over apical tergites, ventral flange pigmented, weakly scrobiculate with other irregular sculpturing.

Male.—similar to female except as follows: soma and coxae entirely black, 39 flagellomeres instead of 43, flagellomeres not clearly elongate as in female, most flagellomeres with width/length less than or equal to 0.8.

Holotype.—female: CANADA, BRITISH COLUMBIA, Summit Lake, Mile 392 Alaska Hwy., VII-16-1959, E. E. MacDougall. Deposited in CNC.

Paratypes.—male: CANADA, BRITISH COLUMBIA, Atlin, VI-26-1955, B. Gibbard; male: CANADA, BRITISH COLUMBIA, Clinton, VI-18-1938, G. S. Walley. Paratypes deposited in CNC.

Biology.—host unknown.

Distribution.—known only from type localities in British Columbia, Canada.

Comments.—Female is distinctive among west Canadian species in black metasomal tergite II, male and female are distinctive among west Canadian species and similar to *A. cartwrightensis (*E. Canada) in densely rugulocostate tergites I and II. Female can be distinguished from female *A. cartwrightensis* by bicolored head

in contrast to all-black head in *A. cartwrightensis*, mostly yellow metacoxae, all-yellow metatrochanters, extensive yellow laterally in metasomal tergites I and II, and extensive yellow posteriorly in tergites III and IV, in contrast to these sclerites all black in *A. cartwrightensis*.

Etymology.—the specific name refers to the language of the Interior Salish people who live in the central area of British Columbia where the type specimens were collected.

Aleiodes (*Tetrasphaeropyx*) *selu* Fortier new species

Female.—**Body color:** head, mesosoma entirely yellow-orange except black antennae, inter-ocellar space, mesopleural venter, propodeum; metasomal tergite I black basally, yellow-orange apically; tergite II entirely yellow-orange; tergite III black with yellow–orange apical border; tergite IV black in basal half, yellow in apical half; legs with yellow-orange coxae and femora, brown tibiae and tarsi; wings hyaline, veins, stigma brown. **Body length:** 3.9 mm; fore wing length 3.2 mm. **Head:** ocelli medium-small, ocell-ocular distance about 1.2 length of longest diameter of lateral ocellus, basal 7 flagellomeres only slightly longer than wide, width about 0.9 length of flagellomere; malar space long, about 1.9 width of mandibular base and about 0.55 length of eye height; occipital carina complete at vertex; clypeus weakly swollen, oral space small, circular, horizontal diameter about equal to mandibular basal width, face coriaceous, fine transverse carinae below antennal scrobes. **Mesosoma:** pronotum not transversely bisected laterally by scrobiculate sulcus, pronotum shelf-like medially, rugocostate ventro-laterally, foveolate dorso-laterally; mesoscutum foveolate over coriaceous surface, notauli scrobiculate terminating posteriorly at lateral edges of posterior rugose area; mesopleuron with well-defined precoxal sulcus, well defined costae in precoxal sulcus, mesopleuron heavily foveolate; propodeum heavily rugose, steeply declivous apically, median carina complete apically. **Legs:** tarsal claws very small, not extending to tarsal apices, not pectinate apically, hind coxae coarsely foveolate dorsally. **Wings:** fore wing with vein r 0.75 length of 3RSa, second submarginal cell elongate-trapezoidal, vein 1CUa long, about 0.4 length of 1Cub; hind wing with vein RS slightly sinuate, marginal cell narrowest in middle, vein 1r-m 0.8 length of vein 1M, vein 1M 0.6 length of M+CU, vein m-cu pigmented, 0.5 length of 1r-m. **Metasoma:** metasomal tergite I rugose-areolate with a few longitudinal costae; tergite II rugulose; tergites III and IV foveolate, tergite IV a complete carapace over apical tergites, ventral flange of carapace completely recurved apically.

Male.—differs from female in as follows: 1) brown palpi, propleuron, mesoscutum, in contrast to these sclerites yellow orange in female; 2) mesopleuron bicolored with extensive black above venter in contrast to entirely yellow-orange above venter in female; 3) metapleura, metasoma entirely black in contrast to extensively yellow-orange in female; 4) metasomal tergites I and II much more coarsely rugocostate than in female; 5) tergite III rugocostate rather than foveolate as in female; 6) fore wing vein r long and 2nd submarginal cell short trapezoidal, vein r 1.2 length of 3RSa in male, in contrast to vein r 0.75 length of 3RSa in female and 2nd submarginal cell elongate trapezoidal in female.

Holotype.—female: USA: NORTH CAROLINA, Southern Pine, April 28, 1965, L.A. Kelton, coll. Deposited in NMNH.

Paratype.—male: same data as holotype. Deposited in NMNH.

Biology.—host unknown.

Comments.—This species falls within a group of species with deep, well developed carapaces in which the interior angle of curvature is less than 90°, with small ocelli, and with extensive foveolate sculpturing. It is similar to *A. catherinensis* that also occurs in the southeast Nearctic, but differs in having black coloration on the propodeum and tergites I, III, and IV while *A. catherinensis* is entirely orange.

Etymology.—The specific name refers to the Cherokee Corn Woman, Selu, and refers to the bright yellow-orange coloration of the female.

Aleiodes* (*Tetrasphaeropyx*) *sexmaculativorax
Fortier 2007b: 11–12

Female.—**Body color**: face yellow except brown or black area on middle below antennal sockets, yellow-orange around dorsal 1/4 of eyes, otherwise frons, vertex, temple brown, gena yellow-orange; antennae brown; mesosoma entirely brown except sometimes pronotum with orange and/or tegula orange; basal 1/2 – 3/4 of metasomal tergite I blackish brown, apical 1/2-1/4 yellow-orange; tergite II entirely yellow-orange; tergites III and IV entirely blackish-brown, sometimes basal edge of tergite III yellow-orange; legs yellow-orange except all tarsi and metatibiae brown; wing veins, stigmas uniformly brown. **Body length**: 3.4-4.0 mm; wing length: 3.1-3.3 mm. **Head**: 39-40 flagellomeres, all longer than wide, malar space short, 0.75 – 1.0 length of mandibular basal width and about 0.3 of eye height; temple width 0.5 – 0.6 width of eye, occipital carina incomplete at vertex; ocelli medium, longest diameter of lateral ocellus 1.0 – 1.3 length of ocell-ocular distance; oral space small, circular, horizontal diameter about equal to basal width of mandible; face coriaceous with weak transverse carinulation; vertex coriaceous with weak transverse carinulation. **Mesosoma**: pronotum coriaceous antero-laterally, costate in extreme antero-lateral corners, shiny-coriaceous postero-laterally; scutum and scutellar disc coriaceous, lateral lobes of scutum with regular shallow indentations, scutellar disc with weak carinulation, notauli scrobiculate, ending posteriorly in rugose area; mesopleuron coriaceous, precoxal sulcus wide, shallowly concave with carinulae, mesopleuron with antero-posteriorly running carinulae ventral of subalar sulcus; propodeum rugose-areolate, median carina complete. **Legs**: metacoxae coriaceous dorsally, tarsal claws without apical pectination. **Wings**: forewing second submarginal cell length polymorphic, usually long (vein r less than or equal to 0.7 of 3RSa) (67%), sometimes short (vein r greater than or equal to 0.8 of 3RSa) (33%), vein 1cu-a beyond 1M by 1.1 – 1.3 length of 1cu-a; hind wing with RS slightly recurved in middle, marginal cell narrowest in middle, vein 1r-m 0.5 – 0.6 length of 1M, 1M 0.7 – 0.75 of M+CU, vein m+cu present as a faint fold, length variable, 0.5-0.8 length of 1r-m. **Metasoma**: tergite I finely rugulocostulate to rugose-areolate; tergite II finely rugulocostulate; tergites III and IV rugulose-areolate; tergite IV a shallow carapace over all apical tergites, internal angle of curvature greater than 90º.

Male.—unknown

Holotype.—female: CANADA:ALBERTA, Evansburg, (latitude 53.36N , longitude 114.59W), host geometrid *Semiothisa sexmaculata* (Packard 1867), ex: *Larix* sp. (Larch) emerged January 31, 1956. Deposited in CNC.

Paratypes.— female: CANADA: ALBERTA, 11 miles east of Spruce Grove, latitude: 53.54N, longitude: 113.91W), host geometrid *S. sexmaculata*, emerged January 26, 1956; female: CANADA: ALBERTA, Stony Plain (latitude: 53.53N, longitude: 114.00W), host geometrid *S. sexmaculata*, ex: *Larix* sp. (Larch), emerged January 30, 1956. Paratypes deposited in CNC

Distribution.—known only from type localities in Alberta, Canada.

Biology.—reared from geometrid S*emiothisa sexmaculata* (Packard); two records of hosts feeding on *Larix* (Larch).

Comments.—This species is closely similar to *Aleiodes anatariatus* and *A. dissiticarina*. Two out of 3 specimens have long forewing second submarginal cells, such as in *A. anatariatus*, while 1 has a short second submarginal cell such as in *A. dissiticarina*. The second metasomal tergite of this species has finely, closely rugulocostate sculpturing, in contrast to the coarsely rugocostate sculpturing of the second metasomal tergites with costae widely separated in both *A. anatariatus* and *A. dissiticarina*. Interestingly, the predominant host records for both *A. anatariatus* and *A. dissiticarina* are *S. granitata*, while the sole host association of this species is *S. sexmaculata.* This species has only been found in the vicinity of Edmonton, Alberta. *A. anatariatus* ranges throughout British Columbia to southern Yukon Territory as well as Alberta. *A. dissiticarina* has been found in northern and southern British Columbia and in southwestern Quebec.

Etymology.—The specific names comes from the name of the host species of the type specimens, *Semiothisa sexmaculata*, and the Latin "*vorax*," which refers to a devourer of something.

Aleiodes* (*Tetrasphaeropyx*) *shawi
Fortier 2007a: 28–30

Female.— **Body color**: Head yellow-orange except ventral extremity of genae, mandibles, clypeus, labrum, and palps pale yellow; inter-ocellar triangle black; scapes yellow-orange basally, black apically, pedicels black, annelli light brown, flagellae black; pronotum yellow-orange; propleuron yellow-orange; scutum yellow-orange except black spot on each postero-lateral "shoulder" and black horizontal mark at anteromedial extremity of scutum; scutellar disc yellow except apical extremity black; mesopleuron bicolored; mesosterna mostly black with central yellow orange spots, contiguous pale white spots apico-medially; metanotum apical of scutellum black; metapleura black; propodeum black; black semicircular area in basomedial area of first metasomal tergite, otherwise tergite pale yellow-white; second metasomal tergite pale yellow-white; third and fourth metasomal tergites black; front coxae, trochanters and trochantellae pale yellow-white, femora, tibiae, and basal 4 segments of tarsi yellow, apical segment dark brown; mesothoracic legs as follows: coxae yellow, trochanters, trochantelli, and tibiae pale yellow-white, femora yellow, tarsi brown; metathoracic legs as follows: coxae yellow, trochanters pale yellow-white, femora mostly yellow except black apically, tibiae pale whitish-tan, basitarsomeres dark brown medially, pale basally and apically, second to fourth tarsomeres dark brown except pale apically, apical tarsomere dark brown; wings hyaline, forewing veins pale yellow at base of wing, otherwise dark brown, stigma blackish brown, forewing vein r-m colorless medially, (RS+M)b colorless, hind wing RS colorless, veins basal of cu-a colorless, then gradually becoming darker, veins including and apical to r-m dark, m-cu faintly pigmented. **Body length**: 4.3 mm; fore wing length: 3.6 mm. **Head**: 42 flagellomeres, all distinctly longer than wide; malar space medium, about equal to basal width of mandible and 0.6 length of eye height; temple medium, about 0.6 width of eye; occipital carina incomplete at vertex; oral space small, circular, horizontal diameter about equal to mandibular basal width; medial height of clypeus 0.8 of medial height of oral opening; ocelli medium, ocell-ocular distance only slightly larger than longest diameter of lateral ocellus; face with faint shallow carinae over a coriaceous surface, narrow carinae extending from point midway between anterior edges of antennal bases down 3/4 of length of face; frons with faint, shallow carinae over coriaceous surface; vertex rugocostate with transverse costae, crease between lateral ocelli; temples coriaceous, punctate adjacent to occipital carina. **Mesosoma**: antero-medial area of pronotum areolate-rugulose, each side bisected by transverse scrobiculate sulcus, scrobiculate pattern fading posteriorly on each side, sulci dividing ventro-lateral and dorso-lateral areas on each side of pronotum, dorso-lateral areas smooth-punctate to scrobiculate, ventro-lateral area shiny, smoothly, faintly rugulose; scutum faintly areolate-rugulose over a coriaceous surface, notauli scrobiculate, faintly defined median ridge extending from anterior edge of scutum to top of anterior declivity, continuing posteriorly as a crease to postero-medial rugose area into which notauli terminate; scutellar disc areolate-rugulose; mesopleuron rugulose anteriorly becoming sparsely smooth-punctate dorsally anterior to and on anterior portion of central disc, otherwise central disc nitid, area posterior to central disc punctate, sternaular area concave, shining with faint vertically running costae; propodeum areolate-rugulose; metapleuron areolate-rugulose. **Legs:** tarsal claws with basal pectination only, length of inner spurs of hind tibiae about 0.3 of hind basitarsi; hind coxae faintly areolate-rugulose dorsally. **Wings:** front wing with vein r short, 0.5 length of 3RSa and 0.7 length of m-cu, vein 1cu-a beyond 1M by distance about equal to length of 1cu-a, 1CUa short, about 0.2 length of 1CUb; hind wing marginal vein not tubular and slightly recurved, marginal cell narrowest in middle, 1M about 1.5 length of 1r-m, M+CU about 1.3 length of 1M, vein m+cu present, faintly pigmented, about 0.6 length of 1r-m and immediately posterior to it, adjoining it. **Metasoma:** tergite I areolate-rugose, areolae small and divided by thick, rounded carinae, sculpturing similar to propodeum but areolae smaller, median carina complete; tergite II rugulose, median carina complete; tergite III areolate-rugose, carinae finer than in first two tergites, tergite without any superior medial carina; tergite IV sculpturing closely similar to third, tergite forming a carapace completely covering remaining tergites, internal angle of curvature about 90°; ventral flange broad, scrobiculate, well defined, recurved except at apical tip; ovipositor sheaths 0.5 length of hind basitarsus.

Male.—unknown.

Holotype.— female: USA: ARKANSAS, Washington Co., Mt. Sequoyah, 600 m, host geometrid, host plant *Cercis canadensis* (redbud) 1-10/VIII/1994, J. B. Whitfield, coll. Deposited in ESUW. Specimen was lost after initial description. Images taken before loss of the specimen are archived at www.morphbank.net and can be accessed at the following URLS:

habitus: http://www.morphbank.net/Show/index.php?id=202676&imgType=jpeg
habitus: http://www.morphbank.net/Show/index.php?id=202678&imgType=jpeg
vertex: http://www.morphbank.net/Show/index.php?id=202680&imgType=jpeg
mesopleuron: http://www.morphbank.net/Show/index.php?id=202681&ImgType=jpeg
metasomal dorsum: http://www.morphbank.net/Show/index.php?id=202682&ImgType=jpeg
wings: http://www.morphbank.net/Show/index.php?id=202683&ImgType=jpeg
metasomal tergite I: http://www.morphbank.net/Show/index.php?id=202686&ImgType=jpeg
metasomal tergite II: http://www.morphbank.net/Show/index.php?id=202687&ImgType=jpeg
host mummy: http://www.morphbank.net/Show/index.php?id=202690&ImgType=jpeg
host mummy: http://www.morphbank.net/Show/index.php?id=202691&ImgType=jpeg
Host material deposited at NMNH.

Neotype.—Female: USA: MARYLAND, Prince George Co., Calvert Rd., host: *Semiothisa aemulataria*, June 12, 1994, host plant *Acer negundo* (box elder), wasp em. June 29, 1994, A.S.C., coll. Deposited in ESUW.

Distribution.—Known only from type locality in Arkansas and Maryland USA.

Biology.—Reared from unknown geometrid host feeding on *Cercis* sp. and geometrid *Semiothisa aemulataria* feeding on box *Acer negundo* (Fortier 2008).

Comments.—A strikingly colored species. Pale yellow-white coloration on first and second metasomal tergites, foreleg coxae, and trochanters and trochantellae of all legs distinguish this species. This species is similar to *A. accohannocki* and *A. mannegishi*. It may be distinguished from *A. accohannocki* by yellow-orange mesoscutum color in contrast to black the latter species. It may be distinguished from *A. mannegishii* by diameter of lateral ocellus roughly equal to ocell-ocular length, in contrast to lateral ocellus diameter 2.0 or more length of ocell-ocular distance in *A. mannegishii*.

Etymology.—Named after Scott Shaw, professor and curator of the Rocky Mountain Systematic Entomology Laboratory (ESUW) in Laramie, Wyoming.

Aleiodes (*Tetrasphaeropyx*) *squilaxensis* Fortier new species

Female.—**Body color**: head, including antennae and palps entirely black; mesosoma nearly entirely yellow-orange, propleuron and propodeum black; metasoma nearly entirely black, tergites I and II yellow-orange on lateral edges; legs entirely black; wings hyaline, veins and stigmas brown. **Body length**: 4.6 mm; wing length: 4.0 mm. **Head**: 43 flagellomeres, basal 15 all distinctly longer than wide; width/length for each less than 0.80; malar space long, 1.4 width of mandibular base and 0.6 length of eye height; oral space small, oral space medial height 1.06 length of clypeus medial height, oral space horizontal diameter 1.0 width of mandibular base; occipital carina incomplete at vertex; ocelli small, ocell-ocular diameter 1.3 length of longest diameter of lateral ocellus; facial sculpturing coriaceous, transverse carinulae ventral of antennal sockets. **Mesosoma**: each side of pronotum transversely bisected by scrobiculate sulcus, extensively coriaceous ventro-laterally, shiny-coriaceous dorso-laterally; mesoscutum coriaceous, notauli sparsely, faintly scrobiculate, terminating along lateral edges of postero-medial rugose area; mesopleuron with a shallow, diffusely defined precoxal sulcus, extensively coriaceous, carinate in area beneath subalar sulcus; propodeum shallowly, finely rugulose-areolate, median carina complete. **Legs**: metatarsal claw greater than 0.5 width of apex of apical tarsomere, without apical pectination; dorsal surfaces of metacoxae rugose. **Wings**: forewing

vein r long, 0.85 length of 3RSa, submarginal cell nearly rectangular, 1CUa short, less than 0.2 length of 1CUb; hind wing with vein RS sinuate, marginal cell narrowest at middle, 1r-m 0.6 length of 1M, 1M 0.6 length of M+CU, m+cu pigmented brown, 0.75 length of 1r-m. **Metasoma**: tergites I and II finely, densely rugulose, tergites III and IV more finely rugulose than tergites I and II; tergite IV a shallow carapace entirely covering apical tergites, internal angle of curvature of carapace greater than 90°, ventral flange not recurved apically.

Male.—unknown

Holotype.—female: CANADA: BRITISH COLUMBIA, Squilax, 58-5311-04-i, ex: *Itame anataria*; emerged April 27, 1959. Deposited in CNC.

Biology.—reared from geometrid *Itame anataria*.

Distribution.—known only from type locality in Squilax, British Columbia, near the Washington State border.

Comments.—This species and its sister-species *A. parasquilax* are unique among *A.* (*Tetrasphaeropyx*) species in small ocelli, all black head and legs, extensive bright yellow-orange on mesosoma, and delicately rugulocostulate sculpturing on metasomal tergite II. This species may be distinguished from *A. parasquilax* by the following forewing characters: 1) vein r long, greater than 0.8 length of 3RSa, in contrast to vein r 0.70-0.75 length of 3RSa in the latter, and 2) vein 1CUa short, less than 0.2 length of 1CUb, in contrast to 1CUa greater than 0.3 length of 1CUb in the latter species.

Etymology.—The specific name refers to the holotype collection location at Squilax, British Columbia, Canada.

Aleiodes (*Tetrasphaeropyx*) *totuyai* Fortier new species

Female.—**Body color:** soma entirely yellow-orange except black inter-ocellar triangle and base of propodeum; antennae black, legs yellow-orange except apices of hind tibiae and femora black, tarsi of hind legs brown; metasomal tergites I and II yellow-orange except antero-medial black spot on MT I (66%); tergite III and IV black; wings hyaline, wing veins brown, forewing stigma bicolored, yellow basally, black apically. **Body length:** 4.1 mm. forewing length: 3.5 mm. **Head:** ocelli small, ocell-ocular distance 1.1-1.2 length of longest diameter of lateral ocellus; 43-44 flagellomeres, flagellomeres all distinctly longer than wide; malar space long, 0.5-0.6 length of eye height and 1.4-1.7 width of mandibular base; median height of clypeus equal to median height of oral space, oral space small, circular, horizontal diameter 0.8 width of mandibular base; occipital carina complete at vertex; face coriaceous. **Mesosoma:** pronotum shelf-like anteriorly, transversely bisected laterally by scrobiculate sulci, densely, finely rugulose ventro-laterally and shiny-shallowly rugulose dorso-laterally; mesoscutum punctate over coriaceous surface, notauli scrobiculate terminating at lateral edges of postero-medial rugose area; mesopleural sternaular area flat or shallowly concave, carinulate-coriaceous, area dorsal to sternaular area and around nitid central disc densely punctate; propodeum with deeply impressed, coarse rugation, median carina complete. **Legs:** tarsal claws tiny, length less than 0.5 width of apical tarsomere apex, not pectinate apically, dorsal surface of hind coxae shiny-punctate. **Wings:** forewing vein r 0.75-0.8 length of 3RSa, second submarginal cell rectangular, nearly square, vein 1CUa short, 0.2 length of 1CUb; hind wing with vein RS slightly sinuate, marginal vein narrowest in middle, 1r-m 0.6 length of 1M, 1M 0.7 length of M+CU, m+cu pigmented, 0.6 length of 1r-m. **Metasoma:** tergite I heavily rugocostate, rugose medially and rugocostate laterally; tergite II evenly heavily rugose; tergite III with reticulate rugulocostulation; tergite IV heavily rugulose-areolate, a complete carapace over apical tergites, interior angle of curvature about 90°, ventral flange not completely recurved apically.

Male.—unknown.

Holotype.—female: USA: CALIFORNIA, Yolo Co., 4 mi. W. Winters, June 8, 1991, B. Scaccia.

*Paratype*s.—2 females; same data as holotype. Deposited in UCD.

Biology.—host unknown.

Distribution.—known only from type locality in Yolo County, California.

Comments.—This species superficially resembles *A. karawankawai, A. mannegishii, and A. axaceenus* in head, mesosomal, and metasomal coloration. It may be distinguished from *A. karawankawaii and A. mannegishii* by small ocelli in contrast to the latter species' large ocelli. It may be distinguished from *A. axaceenus* by its nearly all-yellow legs in contrast to nearly all-black in the latter species. This species may be further distinguished from all of the latter species by 1) the longer forewing vein r in proportion to 3RSa length; 2) more nearly square second submarginal cell; 3) punctate mesoscutum, mesopleuron, and hind coxae, 4) a pigmented hind wing vein m+cu, and 5) the more ruggedly, deeply impressed rugocostate sculpturing on tergites I and II, in contrast to lack of these characters in the latter species.

Etymology.—This species is named in memory of Totuya, the last known living member of the Ahwahneechee people, who were the former inhabitants of Yosemite National Park, located in California, as were the type specimens.

Aleiodes* (*Tetrasphaeropyx*) *tulensis

Fortier 2006b: 482–483

Female.—Body color: entire soma yellow-orange except propodeum often with black, black antennae; femora, tibiae, tarsi of all legs black except venter of foreleg femora, wing veins brown, stigma bicolored yellow basally, brown apically, wings lightly infumate. Body length: about 4.5 mm. *forewing length*: 3.6-3.7 mm. Head: ocelli small, longest diameter of lateral ocellus about 0.7 length of ocell-ocular distance; 39 flagellomeres, all flagellomeres distinctly longer than wide; malar space 1.2-1.5 width of mandibular base and 0.5 length of eye height; occipital carina incomplete at vertex; oral space height 1.4-1.7 length of clypeal height; face shallowly areolate; frons coriaceous; vertex transversely rugocostate. Mesosoma: pronotum with each side bisected by scrobiculate transverse sulcus dividing each side into ventro-lateral and dorso-lateral areas, punctate dorso-laterally, shelflike medially; mesoscutum foveolate over a coriaceous surface, median lobe with a dark median antero-posterior-running scutal line, line becoming a shallow sulcus posteriorly before merging with median posterior rugose area, notauli weakly scrobiculate; scutellar disc foveolate; mesopleuron foveolate, central disc nitid, precoxal sulcus concave, carinulate; propodeum longitudinal axis compressed, propodeal width 1.4 of length, propodeum foveate, median carina complete. Legs: tarsal claws tiny, not extending to tarsal apex; hind coxae foveolate dorsally. Wings: forewing with vein r long, 0.85 length of vein 3RSa, 1.5 length of r-m, and 1.1 length of m-cu, second submarginal cell nearly square, vein 1cu-a beyond 1M by a distance of 1.5 length of 1cu-a and 0.40 length of 1CUb, thus 1CUa long; hindwing with vein RS slightly recurved, marginal cell narrowest in middle, vein 1r-m about 0.7 length of vein 1M, 1M about 0.6 length of M+CU, vein m+cu tubular, pigmented, about 0.7 of length of 1r-m. Metasoma: tergites I-III foveate; tergite IV foveolate; tergite I with apical width 1.4-1.5 of tergite length, median carina complete; tergite II with median carina complete or incomplete apically; tergite III with median carina absent or incomplete apically; groove between tergites II and III deep and scrobiculate; tergite IV a deep, complete carapace over apical tergites, internal angle of curvature less than 90°, ventral flange complete, recurved apically.

Male.—Unknown.

Holotype.—Female: MEXICO, OAXACA, 1.1 mi. W. El Tule, July 7, 1987, Lovarick, Schaffner colls. Deposited in TAMU.

Paratypes.—Female: MEXICO, OAXACA, same data as holotype. Female: USA, TEXAS, Brewster Co., Big Bend National Park, No. Rosillos Mts., 29.57N, 103.27W, October 3-5, 1991, R. Wharton & J. Woolley. Deposited in TAMU.

Biology.—Unknown.

Comments.—This species is similar to *A. oaxacensis* in having nearly entirely yellow-orange coloration,

small ocelli, extensive foveolate sculpturing, nearly square second submarginal cell, short, wide propodeum and metasomal tergite I. It can be distinguished from *A. oaxacensis* by its black legs, and in some by the mostly black propodeal coloration.

Etymology.—The specific name refers to the type locality near El Tule, Oaxaca, Mexico.

Aleiodes (*Tetrasphaeropyx*) *tullyi* Fortier new species

Female.—**Body color:** Nearly entirely black except legs with yellow on ventral sides, dorsum of hind femur yellow-orange basally, dorsum of tibia sometimes (66%) with some yellow coloration; wings hyaline, forewing veins and stigma black, hind wing veins light brown. **Body length:** 3.7 mm. forewing length: 3.3 mm. **Head:** ocelli small, ocell-ocular distance 2.2 length of longest diameter of lateral ocellus; 40 flagellomeres, most slightly longer than wide, width about 0.76 length of flagellomere, flagellomeres in apical 1/3 of flagellum small, flagellomere width about 0.83 length; malar space long, 1.7-1.8 width of mandibular base and 0.6-0.7 length of eye height; oral space small, median height of clypeus 0.9-1.0 median height of oral space, horizontal diameter 0.9-1.8 width of mandibular base; occipital carina complete at vertex, face finely rugulose. **Mesosoma:** pronotum steeply declivous antero-medially, rugocostate laterally; mesoscutum coriaceous, notauli scrobiculate, terminating posteriorly at lateral edges of antero-median rugose area; mesopleuron without a concave sternaular area, densely, finely rugulose except small nitid central disc; propodeum finely, densely rugulose, median carina complete. **Legs:** tarsal claws tiny, nearly hidden by arolium, dorsal surface of hind coxa densely rugulose. **Wings:** forewing vein r 0.55-0.60 length of 3RSa, second submarginal cell short-trapezoidal to nearly square, vein 1CUa short, 0.27-0.30 length of 1CUb; hind wing with vein RS slightly sinuate, marginal vein narrowest in middle, 1r-m 0.6 length of 1M, 1M 2.0 length of M+CU, m+cu a lightly pigmented vein 0.9-1.0 length of 1r-m. **Metasoma:** tergites I-IV densely rugulo-costulate, tergite IV a shallow carapace over apical tergites, interior angle of curvature greater than 90°, ventral flange undeveloped.

Male.—essentially as in female except: (1) 43 flagellomeres in contrast to 40 in female; (2) legs black ventrally in contrast to extensively yellow in female; (3) hind femur and tibia entirely black dorsally rather than extensively yellow as in female.

Holotype.—female: USA: ALASKA, near McCarthy, 61.4°N, 142.9°W, reared from geometrid *Itame andersoni* (Swett) collected from Drummond's mountain avens (*Dryas drummondi* Richardson ex. Hook), June 8, 1995. Deposited in NMNH.

*Paratype*s.—4 females: same data as holotype except host collection dates May 31, June 1, June 12, 1995, and June 29, 1995; 4 males: same data as holotype except host collection dates May 24, 28, and 29. All paratypes except 2 deposited in NMNH. The other 2, a male and a female, both the only specimens that emerged on June 29, 1995, deposited in UAF.

Biology.—reared from geometrid *Itame andersoni* collected from Drummond's mountain avens (*Dryas drummondi*).

Distribution.—known only from type locality near McCarthy, Alaska..

Comments.—a nearly all black wasp that closely resembles *A. cartwrightensis and A. secwepemc* including densely rugulose metasomal sculpturing. It can be distinguished from the above species by legs nearly entirely black at least dorsally, in contrast to legs yellow-orange in above species.

Etymology.—At the request of Patricia Doak who collected and reared the specimens on which this species description is based, the species name is in honor of Tully, a black Labrador retriever and Dr. Doak's loyal companion and guard on her research expeditions in Alaska's wilderness.

***Aleiodes* (*Tetrasphaeropyx*) *wicayazipa* Fortier**
new species

Female.— **Body color**: yellow-orange except as follows: inter-ocellar triangle, antennae, palps black, wings infumate, veins dark brown, stigmas brown except yellow in basal corner, tibiae and tarsi brown. **Body length**: 3.9 mm. Forewing length: 3.2 mm. **Head**: ocelli tiny, ocell-ocular distance 2.0 length of longest diameter of lateral ocellus, vertex coriaceous; 38 flagellomeres, all distinctly longer than wide; malar space long, 0.6 length of eye height and 1.5 width of mandibular base; oral space small, clypeus medial height 1.0 length of oral space medial height, oral space horizontal diameter 0.9 width of mandibular base; occipital carina incomplete at vertex. **Mesosoma:** each side of pronotum transversely bisected by scrobiculate sulcus, pronotum rugulocostulate ventro-laterally and shiny-coriaceous dorso-laterally; mesoscutum coriaceous, lateral lobes coriaceous-shallowly rugulose, notauli scrobiculate, terminating at lateral edges of shiny rugocostate postero-median area; mesopleuron with shallow, shiny-rugulose precoxal sulcus, mesopleuron extensively shiny-coriaceous; propodeum heavily rugose, postero-lateral tubercles present, median carina complete. **Legs:** tarsal claw length greater than 0.5 width of apex of apical tarsomere, not pectinate apically, dorsal surfaces of metacoxae areolate-coriaceous. **Wings:** infumate, forewing vein r long, 0.9 length of 3RSa, 1CUa 0.3 length of 1CUb; hind wing vein RS slightly sinuate, marginal cell narrowest in middle, 1r-m 0.6 length of 1M, 1M 0.6 length of M+CU, m+cu pigmented, 0.6 length of 1r-m. **Metasoma:** tergite I rugocostate, rugose medially, costate laterally; tergite II rugocostate, most prominent costae laterally; tergites III and IV with heavy, deeply impressed rugulation, tergite IV a deep, complete carapace over apical tergites, internal angle of curvature less than 90°, ventral flange entirely strongly recurved.

Male.—unknown.

Holotype female.—USA, COLORADO, Boulder Co., Boulder: 4 mi. NW, Elev. 6900', VI-7-1961, W. R. M. Mason, coll. Deposited in NMNH.

Distribution.—Known only from type locality in northeastern Colorado USA

Biology.—Unknown.

Comments.—an entirely yellow-orange wasp with infumate wings, tiny ocelli (longest diameter of lateral ocellus 0.5 length of ocell-ocular distance), deeply impressed rugocostate sculpturing on tergites, and tergite IV a deeply developed carapace with internal angle of curvature less than 90°. This species is similar to *A. catherinensis* Fortier. It can be distinguished from the latter as follows: 1) front legs except tibiae and all femora yellow-orange in contrast to black in the latter; 3) vertex coriaceous in contrast to transversely carinate in the latter; and 4) mesopleuron nearly entirely shiny-coriaceous in contrast to heavily foveate in the latter.

Etymology.—The specific name is the Lakota Sioux word for "wasp." The type locality lies in an area formerly inhabited by the Teton Lakota Sioux People.

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TABLE 4. Collection site information for specimens examined.

Species	Type status	Collection location	Lat/Long
accohannockianus	holotype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
accohannockianus	paratype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
accohannockianus	paratype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
accohannockianus	paratype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
accohannockianus	paratype	Fort Meade, Maryland	39º06'23.53" N; 76º44'05.16" W
accohannockianus	paratype	Mississippi County, Arkansas	35º46' N; 90º03' W
accohannockianus	paratype	Mississippi County, Arkansas	35º46' N; 90º03' W
accohannockianus	paratype	Land Between the Lakes, Tennessee	36º51'24.97" N; 88º04'10.64" W
accohannockianus	paratype	Patuxent, Maryland	38º29'39.34" N; 77º03'30.76" W
accohannockianus	paratype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
agryllacearivorax	holotype	Constance Bay, Ontario	45º29'7.8" N; 76º04'28.53" W
anatariatus	holotype	Atlin Road Milepost 54, British Columbia	59.58º N; 133.67º" W
anatariatus	paratype	Alaska Highway Milepost 926, Yukon Territory	61.5N; 136 W
anatariatus	paratype	Frazier Canyon, British Columbia	49°38'00" N; 1121°25'00" W
anatariatus	paratype	Lillooet, British Columbia	50º4'11.53" N; 121º56'10.82" W
anatariatus	paratype	White Horse, Yukon Territory	60° 41' N; 135° 08' W
anatariatus	paratype	Coombs, British Columbia	49º18'17.43" N; 124º25'23.04" W
aquaedulcensis	holotype	Green River, Wyoming	41°31'44.04" N; 10°27'59.58" W
aranamarianus	holotype	Cameron County, Texas	26º07' N; 97º31' W
aranamarianus	paratype	Cameron County, Texas	26º07' N; 97º31' W
aranamarianus	paratype	Cameron County, Texas	26º07' N; 97º31' W
kohook	holotype	Rawlins, Wyoming	41º47'22.99" N; 107º14'17.84" W
kohook	paratype	Rawlins, Wyoming	41º47'22.99" N; 107º14'17.84" W
kohook	paratype	Rawlins, Wyoming	41º47'22.99" N; 107º14'17.84" W
areolatus	holotype	Carlsbad, New Mexico	32°25'1.09" N; 104°13'41.53" W
areolatus	paratype	Carlsbad, New Mexico	32°25'1.09" N; 104°13'41.53" W
arikaranus	holotype	Newell, South Dakota	44º43'11.21" N; 103º25'28.63" W
arikaranus	paratype	Hamar, North Dakota	47º49'49.84" N; 98º35'28.78" W
assateaguenus	holotype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
assateaguenus	paratype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
assateaguenus	paratype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
assateaguenus	paratype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
assateaguenus	paratype	Fort Meade, Maryland	39º06'23.53" N; 76º44'05.16" W
axaceenus	holotype	Durango, Mexico	32º14'50.11" N; 115º15'04.89" W
axaceenus	paratype	Durango, Mexico	32º14'50.11" N; 115º15'04.89" W
axaceenus	paratype	Durango, Mexico	32º14'50.11" N; 115º15'04.89" W
axaceenus	paratype	Durango, Mexico	32º14'50.11" N; 115º15'04.89" W
axaceenus	paratype	Durango, Mexico	32º14'50.11" N; 115º15'04.89" W
axaceenus	paratype	Durango, Mexico	32º14'50.11" N; 115º15'04.89" W
bretti	holotype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
bretti	paratype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
brevicellula	holotype	Van Horn, Texas	31°02'28.53" N; 104°49'51.28" W
cartwrightensis	holotype	Cartwright, Labrador	53.42 N; 57.0 W
cartwrightensis	holotype	Cartwright, Labrador	53º43'23.33" N; 57º01'03.83" W
catherinensis	holotype	St. Catherine's Island, GA	31.37N; 81.09 W

Species	Type status	Collection location	Lat/Long
catherinensis	paratype	Dorchester County, South Carolina	33°03'46.86" N; 80°16'19.65" W
cheyennenus	holotype	Rawlins, Wyoming	41º47'22.99" N; 107º14'17.84" W
cheyennenus	paratype	Rawlins, Wyoming	41º47'22.99" N; 107º14'17.84" W
chisosianus	holotype	Big Bend National Park, Texas	29º14'59.96" N; 103º14'59.97" W
chisosianus	paratype	Big Bend National Park, Texas	29º14'59.96" N; 103º14'59.97" W
chisosianus	paratype	Seminole Canyon State Park, Texas	29º41'05.98" N; 101º18'37.3" W
chisosianus	paratype	Lower Penasco, New Mexico	36º10'29.28" N; 105º41'28.39" W
chumashanus	holotype	Paso Robles, California	35º37'30.36" N; 120º41'28.81" W
citriscutum	holotype	Coronado National Forest, Arizona	32°26'14.23" N; 110°44'53.71" W
citriscutum	paratype	Kitt Peak, Arizona	33°25'22.45" N; 110°48'32.25" W
citriscutum	paratype	Valmont Butte, Colorado	40°00'50.86" N; 105°16'41.90" W
citriscutum	paratype	Boulder, Colorado	40°00'55.60" N; 105°16'45.22" W
cochisensis	holotype	Douglas, Arizona	31.344° N; 109.544° W
cochisensis	holotype	Douglas, Arizona	31.344º N; -109.544º W
copiosus	holotype	Big Bend National Park, Texas	29º14'59.96" N; 103º14'59.97" W
copiosus	paratype	Port Isabel, Texas	26º04'34" N; 97º12'38.06" W
copiosus	paratype	Port Isabel, Texas	26º04'34" N; 97º12'38.06" W
copiosus	paratype	Three Rivers, Texas	28º28'11.67" N; 98º10'47.13" W
copiosus	paratype	Mesilla Park, New Mexico	32º17'41.75" N; 106º36'43.76" W
copiosus	paratype	Welder Wildlife Refuge, Texas	28º01' N; 97º31' W
copiosus	paratype	Deming, New Mexico	32º16'08.66" N; 107º45'30.33" W
copiosus	paratype	Deming, New Mexico	32º16'08.66" N; 107º45'30.33" W
copiosus	paratype	Chaparral, New Mexico	32º02'17.20" N; 106º24'36.71" W
copiosus	paratype	Jim Wells County, Texas	27º46' N; 98º06' W
crassjugosus	holotype	Stittsville, Ontario	45º18'7.29" N; 75º58'05.01" W
crassjugosus	paratype	Stittsville, Ontario	45º18'7.29" N; 75º58'05.01" W
crassjugosus	paratype	Stittsville, Ontario	45º18'7.29" N; 75º58'05.01" W
crassjugosus	paratype	Stittsville, Ontario	45º18'7.29" N; 75º58'05.01" W
crassjugosus	paratype	Stittsville, Ontario	45º18'7.29" N; 75º58'05.01" W
crassjugosus	paratype	Stittsville, Ontario	45º18'7.29" N; 75º58'05.01" W
crassjugosus	paratype	Manitoba, Canada	54º31'13.78" N; 95º29'24.83" W
dabai	holotype	Rawlins, Wyoming	41º47'22.99" N; 107º14'17.84" W
dakotensis	holotype	Ft. Thompson, South Dakota	44º04'51.31" N; 99º26'34.15 " W
dakotensis	paratype	Leonard, North Dakota	46º39'15.88" N; 97º14'28.90" W
dissiticarina	holotype	Hope, British Columbia	49º22'43.94" N; 121º26'40.52" W
dissiticarina	paratype	Hope, British Columbia	49º22'43.94" N; 121º26'40.52" W
dissiticarina	paratype	Mile 14 Dease L. Road, British Columbia	54.4º N; 130º W
dissiticarina	paratype	Hope, British Columbia	49º22'43.94" N; 121º26'40.52" W
dissiticarina	paratype	Lillooet, British Columbia	50º4'11.53" N; 121º56'10.82" W
dissiticarina	paratype	Courtenay, British Columbia	49º41'12.44" N; 124º59'35.12" W
dissiticarina	paratype	Okeover Arm, British Columbia	49º37'06.08" N; 124º21'09.57" W
dissiticarina	paratype	Okeover Arm, British Columbia	49º37'06.08" N; 124º21'09.57" W
dissiticarina	paratype	Snowball Creek, British Columbia	49º06’ N; –18º27’ W
dissiticarina	paratype	Cascade, British Columbia	49º43.94" N; 118º12'27.16" W
dissiticarina	paratype	Coombs, British Columbia	49º18'17.43" N; 124º25'23.04" W
dissiticarina	paratype	Senneterre, Quebec	48º23'26.88" N; 77º14'32.17" W

Species	Type status	Collection location	Lat/Long
dissiticarina	paratype	Bon Accord, New Brunswick	46º39'11.74" N; 67º34'49.02" W
dissiticarina	holotype	Black Sturgeon Lake, Ontario	49º20' N; 88º53' W
dissiticarina	paratype	Black Sturgeon Lake, Ontario	49º20' N; 88º53' W
dissiticarina	paratype	Black Sturgeon Lake, Ontario	49º20' N; 88º53' W
dissiticarina	paratype	Parent, Quebec	47º55'13.47" N; 74º36'54.17" W
dorsofoveolatus	holotype	Carlsbad, New Mexico	32°25'1.09" N; 104°13'41.53" W
dorsofoveolatus	holotype	Carlsbad, New Mexico	32°25'1.09" N; 104°13'41.53" W
exiguus	holotype	Big Bend National Park, Texas	29º14'59.96" N; 103º14'59.97" W
fernaldellavorax	holotype	Temple, Texas	31°05'51.94" N; 97°20'33.21" W
fernaldellavorax	paratype	Temple, Texas	31°05'51.94" N; 97°20'33.21" W
fernaldellavorax	paratype	Goshen County, Wyoming	42°05'0.0" N; 10°42'100.0" W
flavinotaulus	holotype	Borrego, California	33°13'16" N; 11°62'0.0" W
flavinotaulus	paratype	no information provided	no information provided
haematoxyloni	holotype	Oaxaca, Mexico	17º03'42.93" N; 96º42'49.26" W
haematoxyloni	paratype	Tequisistlan, Oaxaca	16º23'48.98" N; 95º36'04.95" W
halifaxensis	holotype	Halifax, Nova Scotia	44º38'48.03" N; 63º34'26.67" W
hiisiis	holotype	Craters of the Moon National Monument, Idaho	43º52'29.95" N; 113º29'40.64" W
huberi	holotype	Bells' Corners, Ottawa	45º19'08.41" N; 75º49'50.46" W
huberi	paratype	Luceville, Quebec	48º31'03.98" N; 68º19'31.21" W
illiniwekianus	holotype	Champaign, Illinois	40º06'53.26" N; 88º14'35.69" W
illiniwekianus	paratype	Champaign, Illinois	40º06'53.26" N; 88º14'35.69" W
illiniwekianus	paratype	Champaign, Illinois	40º06'53.26" N; 88º14'35.69" W
illiniwekianus	paratype	Champaign, Illinois	40º06'53.26" N; 88º14'35.69" W
illiniwekianus	paratype	Champaign, Illinois	40º06'53.26" N; 88º14'35.69" W
iowensis	holotype	Ames, Iowa	42º01'31.66" N; 93º37'13.51" W
iowensis	paratype	Rapid City, South Dakota	44º04'29.92" N; 103º13'51.99" W
jaliscoensis	holotype	Autlan, Jalisco	19º47'23.79" N; 104º22'10.42" W
jaliscoensis	paratype	Durango, Mexico	32º14'50.11" N; 115º15'04.89" W
karankawanus	holotype	Kennedy Ranch, Texas	39º09'05.44" N; 98º31'06.36" W
karankawanus	paratype	Kennedy Ranch, Texas	39º09'05.44" N; 98º31'06.36" W
karankawanus	paratype	Portal, Arizona	31º54'57.36" N; 109º08'51.82" W
karankawanus	paratype	San Ygnacio, Texas	27º02'19" N; 99º26'15.49" W
karankawanus	paratype	Andreas Canyon, California	33º41'21.43" N; 116º24'08.06" W
karankawanus	paratype	Kennedy Ranch, Texas	39º09'05.44" N; 98º31'06.36" W
karankawanus	paratype	Kennedy Ranch, Texas	39º09'05.44" N; 98º31'06.36" W
karankawanus	paratype	Kennedy Ranch, Texas	39º09'05.44" N; 98º31'06.36" W
karankawanus	paratype	Arivaca, Arizona	31º34'36.90" N; 111º20'04.80" W
karankawanus	paratype	Eddy County, New Mexico	32.24º N; 103.83º W
kisomm	holotype	Riverside, California	33º58'54.92" N; 117º22'23.13" W
kisomm	paratype	Riverside, California	33º58'54.92" N; 117º22'23.13" W
wicayazipa	holotype	Boulder, Colorado	40°00'55.60" N; 105°16'45.22" W
luhmanus	holotype	Grantsburg, Wisconsin	45º46'27.01" N; 92º41'17.58" W
magnoculus	holotype	Kennedy Ranch, Texas	39º09'05.44" N; 98º31'06.36" W
magnoculus	paratype	Kennedy Ranch, Texas	39º09'05.44" N; 98º31'06.36" W
magnoculus	paratype	Kennedy Ranch, Texas	39º09'05.44" N; 98º31'06.36" W
magnoculus	paratype	Temple, Texas	31°05'51.94" N; 97°20'33.21" W

Species	Type status	Collection location	Lat/Long
magnoculus	paratype	San Ignacio, Texas	27º02'22.06" N; 99º25'55.31" W
magnoculus	paratype	Boch Chica Beach, Texas	254º59'48.48" N; 97º09'02.06" W
magnoculus	paratype	Boch Chica Beach, Texas	254º59'48.48" N; 97º09'02.06" W
magnoculus	paratype	Big Bend Ranch, Texas	29.47º N; 103.77º W
magnoculus	paratype	Big Bend Ranch, Texas	29.47º N; 103.77º W
magnoculus	paratype	Carlsbad, New Mexico	32°25'1.09" N; 104°13'41.53" W
magnoculus	paratype	Comstock, Texas	29º41'21.03" N; 101º10'16.36" W
maidunus	holotype	Lassen, California	40º26'30.90" N; 120º39'33.33" W
mannegishii	holotype	Kennedy Ranch, Texas	39º09'05.44" N; 98º31'06.36" W
mannegishii	paratype	Temple, Texas	31°05'51.94" N; 97°20'33.21" W
nigrilatus	holotype	Big Bend National Park, Texas	29º14'59.96" N; 103º14'59.97" W
nigrilatus	paratype	Beamer, Texas	29º34'33.40" N; 95º12'08.25" W
nigrilatus	paratype	Alpine, Texas	30º21'30.58" N; 103º39'52.94" W
oaxacensis	holotype	Oaxaca, Mexico	17°03'46.81" N; 96°42'50.27" W
omahanus	holotype	Thedford, Nebraska	41º58'42.41" N; 100º34'30.24" W
omahanus	paratype	Halsey, Nebraska	41º54'21.25" N; 100º35'11.21" W
pooedooa	holotype	Wyman Canyon, California	39.22º N; 122.73º W
pooedooa	paratype	Wyman Canyon, California	39.22º N; 122.73º W
parabretti	holotype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
parabretti	paratype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
paracopiosus	holotype	Pyote, Texas	31º32'01.73" N; 103º07'34.89" W
paracopiosus	paratype	Tuscon, Arizona	32º13'17.75" N; 110º55'33.16" W
paracopiosus	paratype	Sabine National Forest, Texas	31º20' N; 93º50' W
paracopiosus	paratype	Fort Davis, Texas	30º35'23.68" N; 103º53'45.07" W
paracopiosus	paratype	Monterrey, Nueva Leon	25º41'07.59" N; 100º18'19.57" W
paracopiosus	paratype	Monterrey, Nueva Leon	25º41'07.59" N; 100º18'19.57" W
paracopiosus	paratype	Van Oorn, Texas	31º02'17" N; 104º49'16.30" W
paracopiosus	paratype	San Antonio, Texas	29º27'21" N; 98º30'34.17" W
paracopiosus	paratype	Sabino Canyon, Arizona	32º16'56.51" N; 110º50'06.51" W
parakisomm	holotype	LaGrange, Texas	30º20'33.72" N; 97º33'19.55" W
paraluhmanus	holotype	Grantsburg, Wisconsin	45º46'27.01" N; 92º41'17.58" W
parareolatus	paratype	Burns, Oregon	43°35'9.68" N; 119°03'15.91" W
parareolatus	paratype	Alakai Lake, Oregon	42°47'28.0" N; 120°23'19.33" W
parareolatus	holotype	Burns, Oregon	43°35'9.68" N; 119°03'15.91" W
parareolatus	paratype	Alkali Lake, Oregon	42º58'25.04" N; 120º01'10.26" W
parasquilaxensis	holotype	Squilax, British Columbia	50º52'00.04" N; 119º35'00.03" W
pilosus	holotype	Bosque, Texas	31°54' N; 97°39' W
pilosus	syntype	Bosque, Texas	31°54' N; 97°39' W
pilosus	topotype	Bosque, Texas	31°54' N; 97°39' W
pilosus	paratype	Eddy County, New Mexico	32°23' N; 103°51.4' W
pilosus	paratype	Temple, Texas	31°05'51.94" N; 97°20'33.21" W
pilosus	paratype	Nederland, Colorado	39°57'43.28" N; 105°30'38.9" W
pilosus	paratype	Cochise County, Arizona	31°55'55" N; 109°44'30" W
pilosus	paratype	Santa Teresa, New Mexico	31°47'43.65" N; 106°42'45.54" W
pilosus	paratype	Chugwater, Wyoming	41°45'18.54" N; 104°49'21.72" W
pilosus(cresson)	holotype	Texas	not specified

Species	Type status	Collection location	Lat/Long
pilosus(cresson)	paratype	Texas	not specified
provancheri	holotype	Mount Albert, Quebec	45º30'38.50" N; 73º38'22.39" W
pseudoanatariatus	holotype	Winters, California	38º31'17.98" N; 121º58'13.74" W
quickei	holotype	Bentson-Rio Grande State Park, Texas	26°13' N; 98°14' W
quickei	paratype	Kennedy Ranch, Texas	39º09'05.44" N; 98º31'06.36" W
quickei	paratype	Chaparral, New Mexico	32º02'17.20" N; 106º24'36.71" W
quickei	paratype	Kennedy Ranch (Jabocillos Pasture), Texas	27º01'10" N; 97º43'20" W
quickei	paratype	Bentson-Rio Grande State Park, Texas	26°13' N; 98°14' W
quickei	paratype	Eddy County, New Mexico	32º19.7' N; 103º46.9' W
quickei	paratype	Kennedy Ranch, Texas	39º09'05.44" N; 98º31'06.36" W
quickei	paratype	Kennedy Ranch (Jabocillos Pasture), Texas	27º01'10" N; 97º43'20" W
quiniguanus	holotype	Monterrey, Nueva Leon	25º41'07.59" N; 100º18'19.57" W
reisi	holotype	Ries Biological Station, Missouri	37º56.956’ N; 91º10.145’W
reisi	paratype	Ries Biological Station, Missouri	37º56.956’ N; 91º10.145’W
secwepemc	holotype	Summit Lake, British Columbia	58º39'43.38" N; 124º38'19.75" W
secwepemc	paratype	Atlin, British Columbia	59º34'42.0" N; 133º42'32.77" W
secwepemc	paratype	Clinton, British Columbia	51º05'29.92" N; 121º35'14.28" W
selu	holotype	Southern Pine, North Carolina	35º08'51.52" N; 80º54'51.39" W
selu	paratype	Southern Pine, North Carolina	34º57'56.51" N; 92º44'55.19" W
sexmaculativorax	holotype	Evansburg, Alberta	53º35'40.36" N; 115º01'14.75" W
sexmaculativorax	paratype	Spruce Grove, Alberta	53º32'52.74" N; 113º54'03.44" W
sexmaculativorax	paratype	Stony Plain, Alberta	53º31'41.24" N; 114º00'20.84" W
shawi	holotype	Mount Sequoyah, Arkansas	34º57'56.51" N; 92º44'55.19" W
shawi	neotype	Prince Georges County, Maryland	38º55'25" N; 76º53'40" W
squilaxensis	holotype	Squilax, British Columbia	50º52'00.04" N; 119º35'00.03" W
totuyanus	holotype	Winters, California	38º31'17.98" N; 121º58'13.74" W
totuyanus	paratype	Winters, California	38º31'17.98" N; 121º58'13.74" W
totuyanus	paratype	Winters, California	38º31'17.98" N; 121º58'13.74" W
tulensis	holotype	Oaxaca, Mexico	17°03'46.81" N; 96°42'50.27" W
tulensis	paratype	Oaxaca, Mexico	17°03'46.81" N; 96°42'50.27" W
tulensis	paratype	Brewster County, Texas	29°50' N; 103°15'02" W
tullyi	holotype	McCarthy, Alaska	61º26' N; 142º55' W
tullyi	paratype	McCarthy, Alaska	61º26' N; 142º55' W
tullyi	paratype	McCarthy, Alaska	61º26' N; 142º55' W
tullyi	paratype	McCarthy, Alaska	61º26' N; 142º55' W

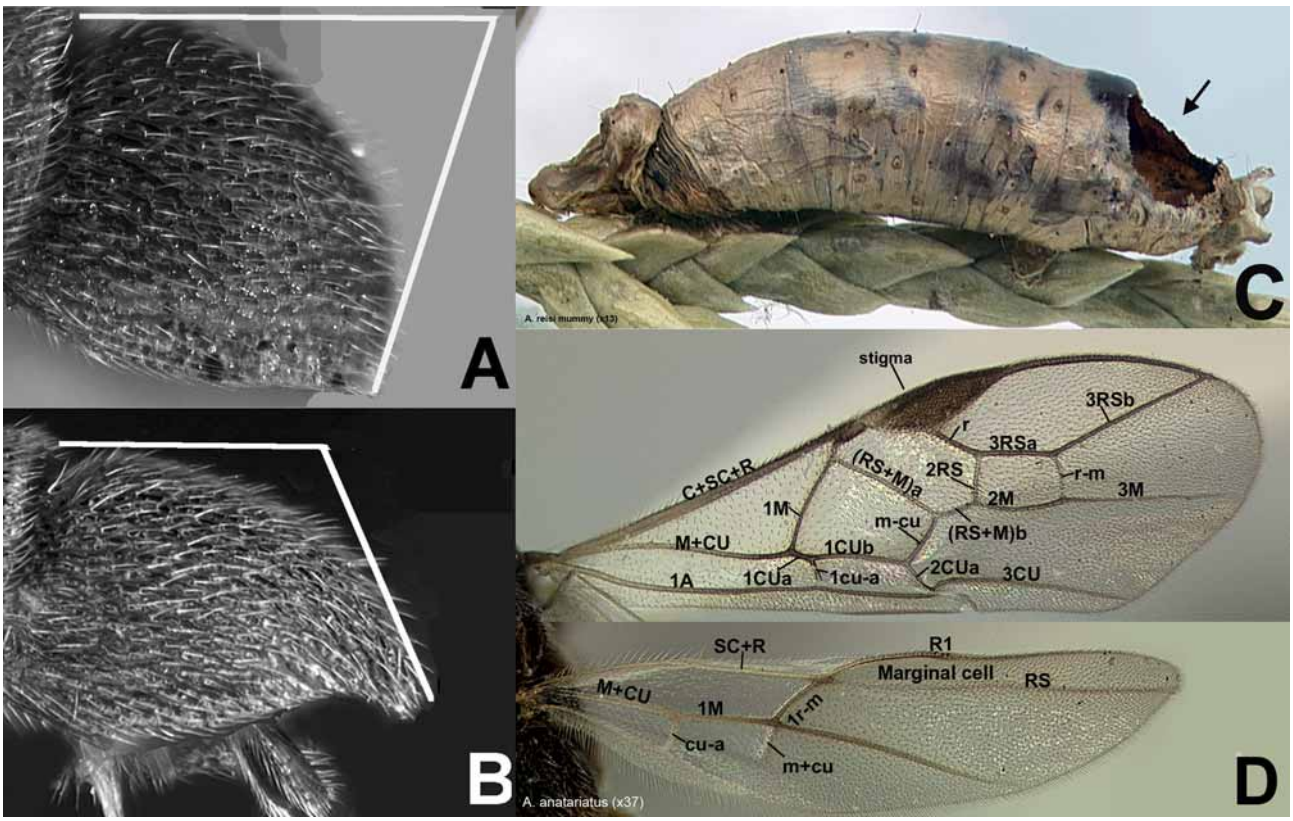

PLATE 1. FIGURES A–D. Features of *Aleiodes* (*Tetrasphaeropx*). A–B, Variation of internal angle of longitudinal curvature of metasomal tergite IV (carapace). A, internal angle of curvature less than 90º (carapace deep); B, internal angle of curvature greater than 90º (carapace shallow). C, Mummified host remains of *Aleiodes reisi*. Arrow indicates adult wasp exit hole. D, Wings of *Aleiodes anatariatus*. Letter abbreviations indicate wing veins (After Sharkey and Wharton 1997).

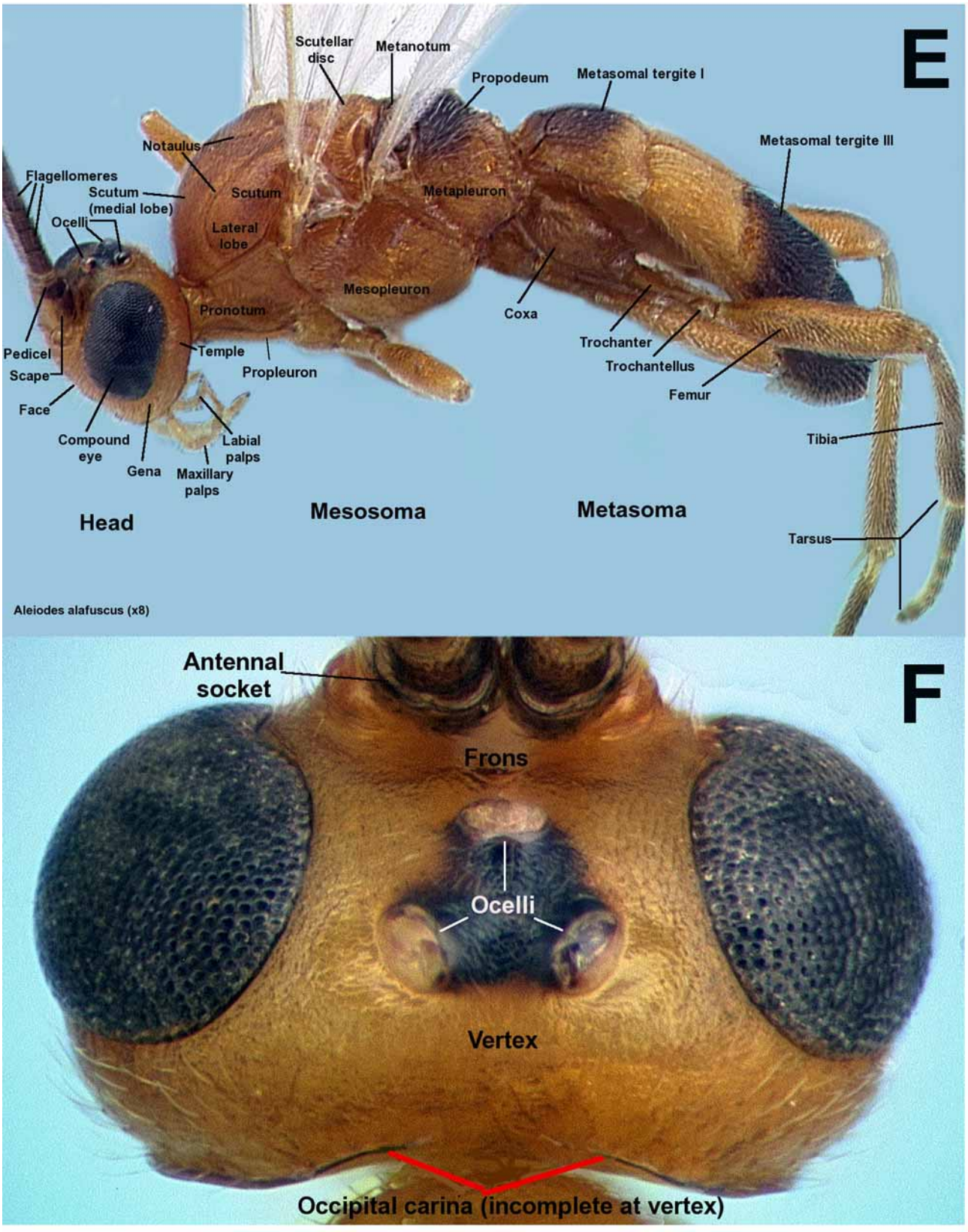

PLATE 2. FIGURES E–F. *Aleiodes alafuscus* with morphological terminology used to describe *Aleiodes* (*Tetrasphaeropyx*) species. E, habitus, lateral view; F, head, dorsal view.

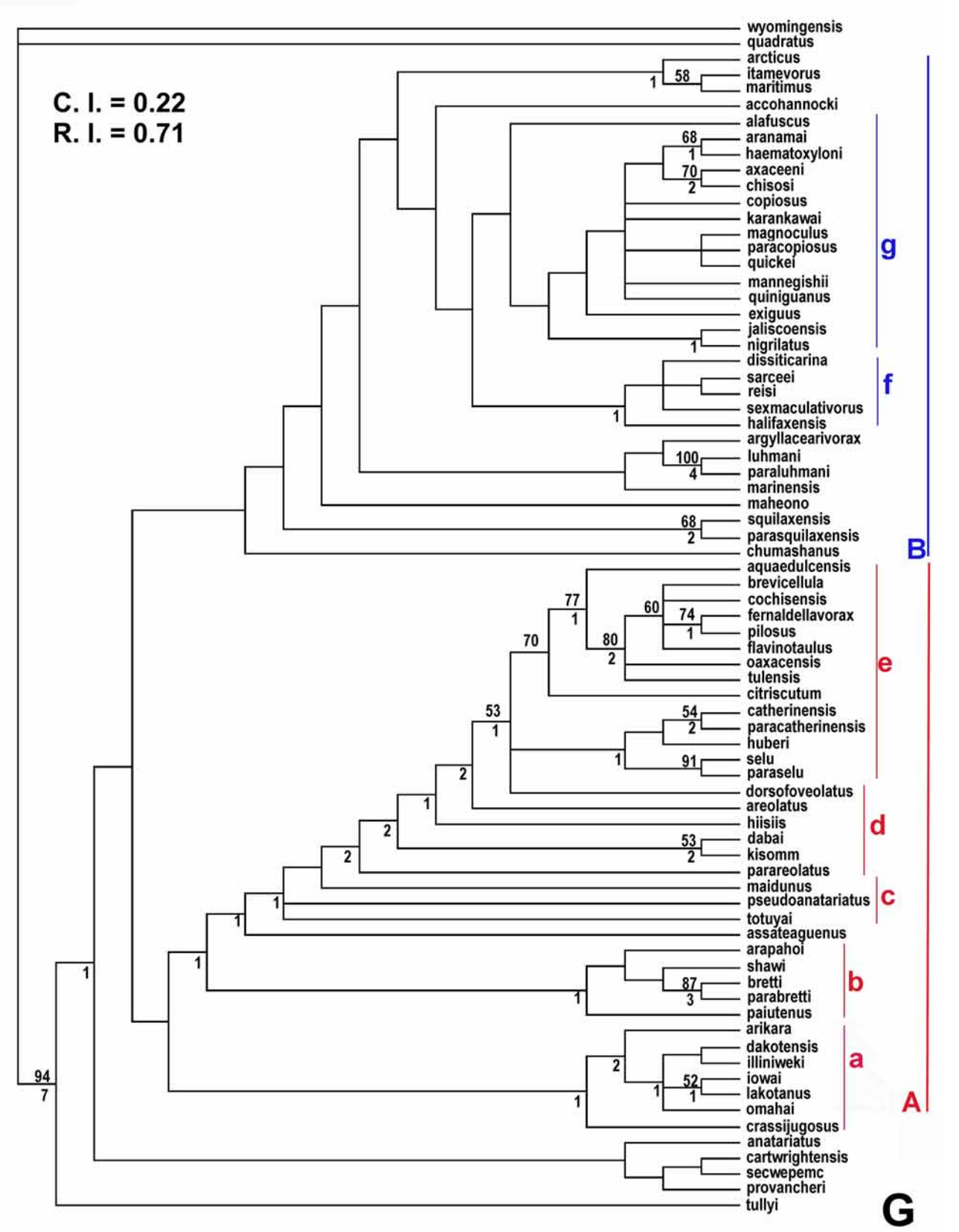

PLATE 3. FIGURE G. Cladogram of strict consensus tree of 3614 most parsimonious trees, each with 541 steps. Numbers above and to the left of each numbered node indicate bootstrap support. Numbers below and to the left of each numbered node indicate Bremer support. Colored capital letters indicate major monophyletic groups. Colored small letters indicate subgroups referred to in the text.

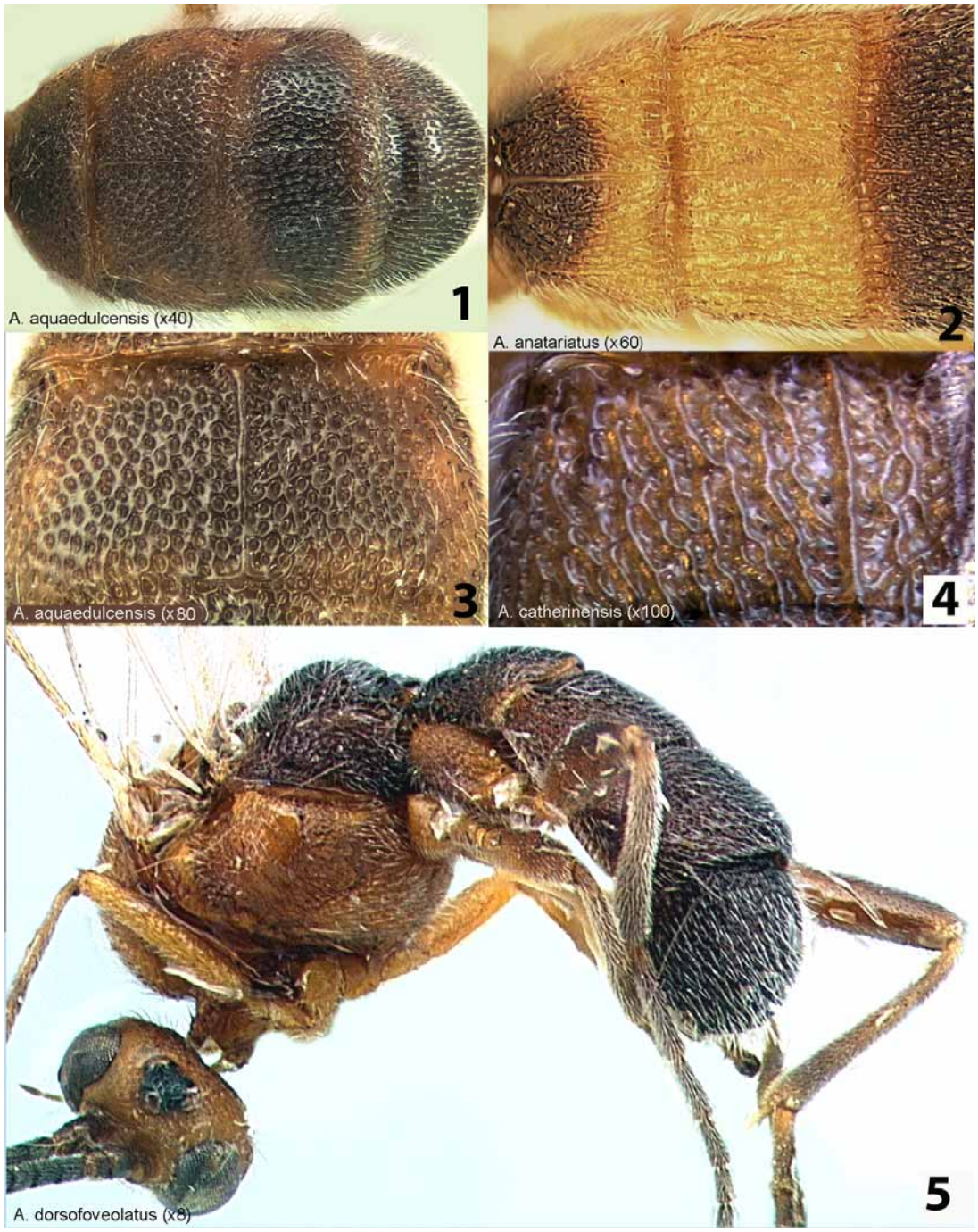

PLATE 4. FIGURES 1–5. Tergite sculpturing of *Aleiodes* (*Tetrasphaeropyx*) species and habitus of *A.* (*Tetrasphaeropyx*) *dorsofoveolatus*. 1, metasoma, *A. aquaedulcensis*; 2, tergites I and II, *A. anatariatus*; 3, tergite II, *A. aquaedulcensis*; 4, tergite II, *A catherinensis*; 5, habitus, *A. dorsofoveolatus.*

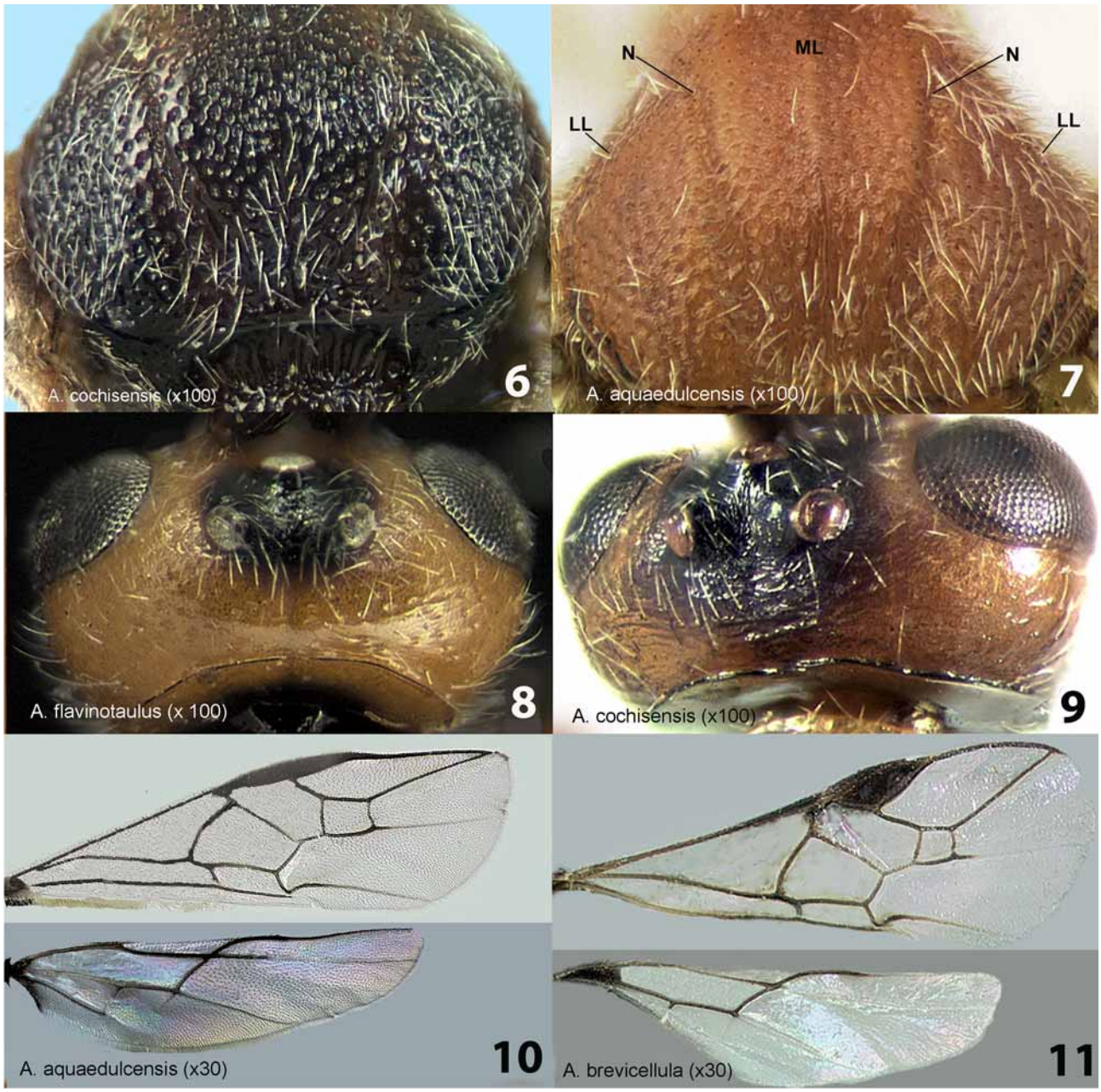

PLATE 5. FIGURES 6–11. Morphological features of *Aleiodes* (*Tetrasphaeropyx*) species. Figs. 6–7, Mesoscutum sculpturing. 6, *A. cochisensis*; 7, *A. aquaedulcensis* (LL = lateral lobe, ML = medial lobe, N = notaulus). Figs. 8–9, Vertex sculpturing. Fig. 8, *A flavinotaulus;* Fig. 9, *A cochisensis*. Figs. 10–11, wings. Fig. 10, *A. aquaedulcensis;* Fig. 11, *A. brevicellula.*

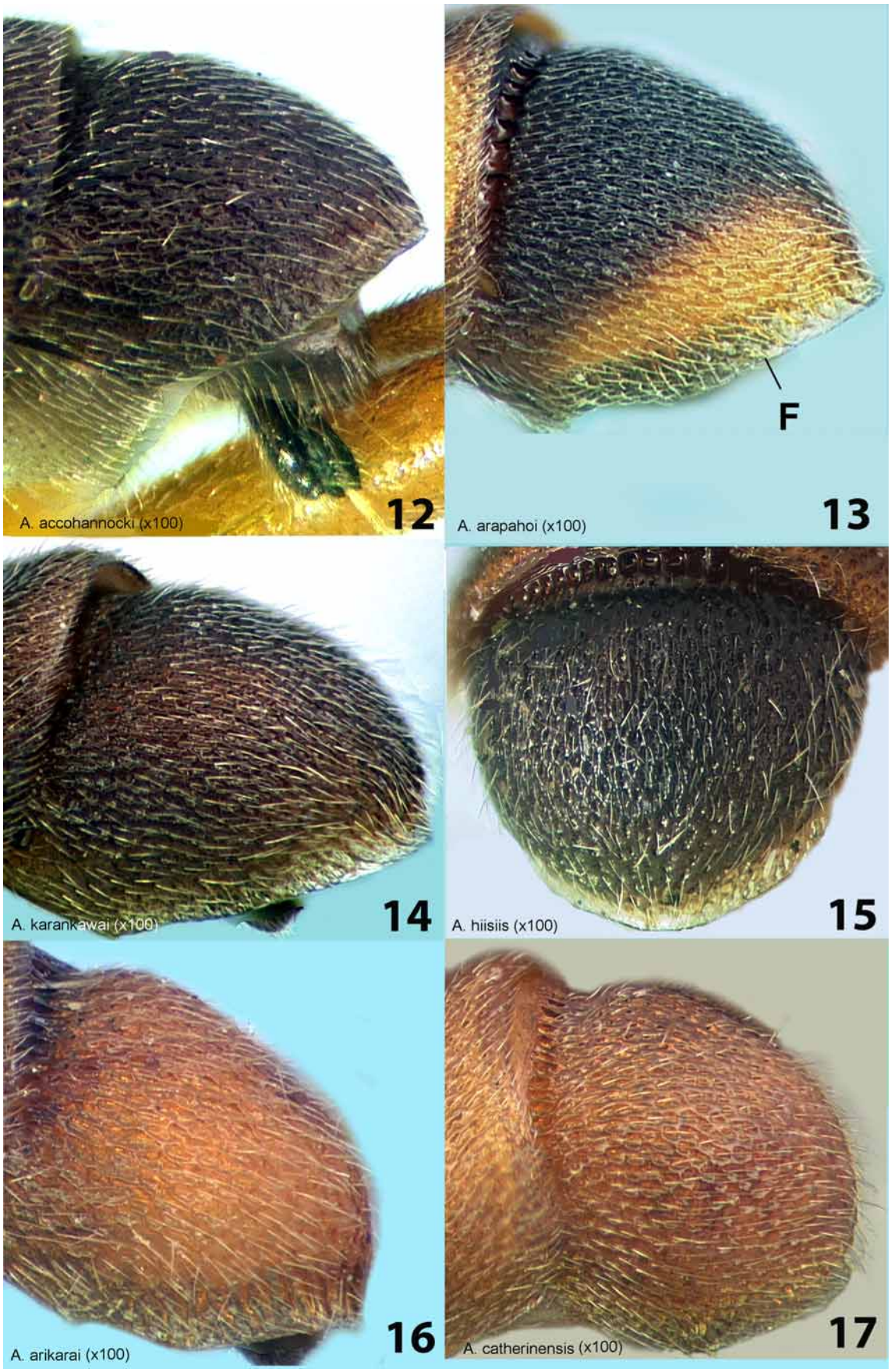

PLATE 6. FIGURES 12–17. Variation in sculpturing patterns of metasomal tergite IV in *Aleiodes* (*Tetrasphaeropyx*) species. 12, *A. accohannocki;* 13, *A. kohook* (F = flange); 14, *A. karankawai*; 15, *A. hiisiis*; 16, *A. arikarai*; 17, *A. catherinensis*.

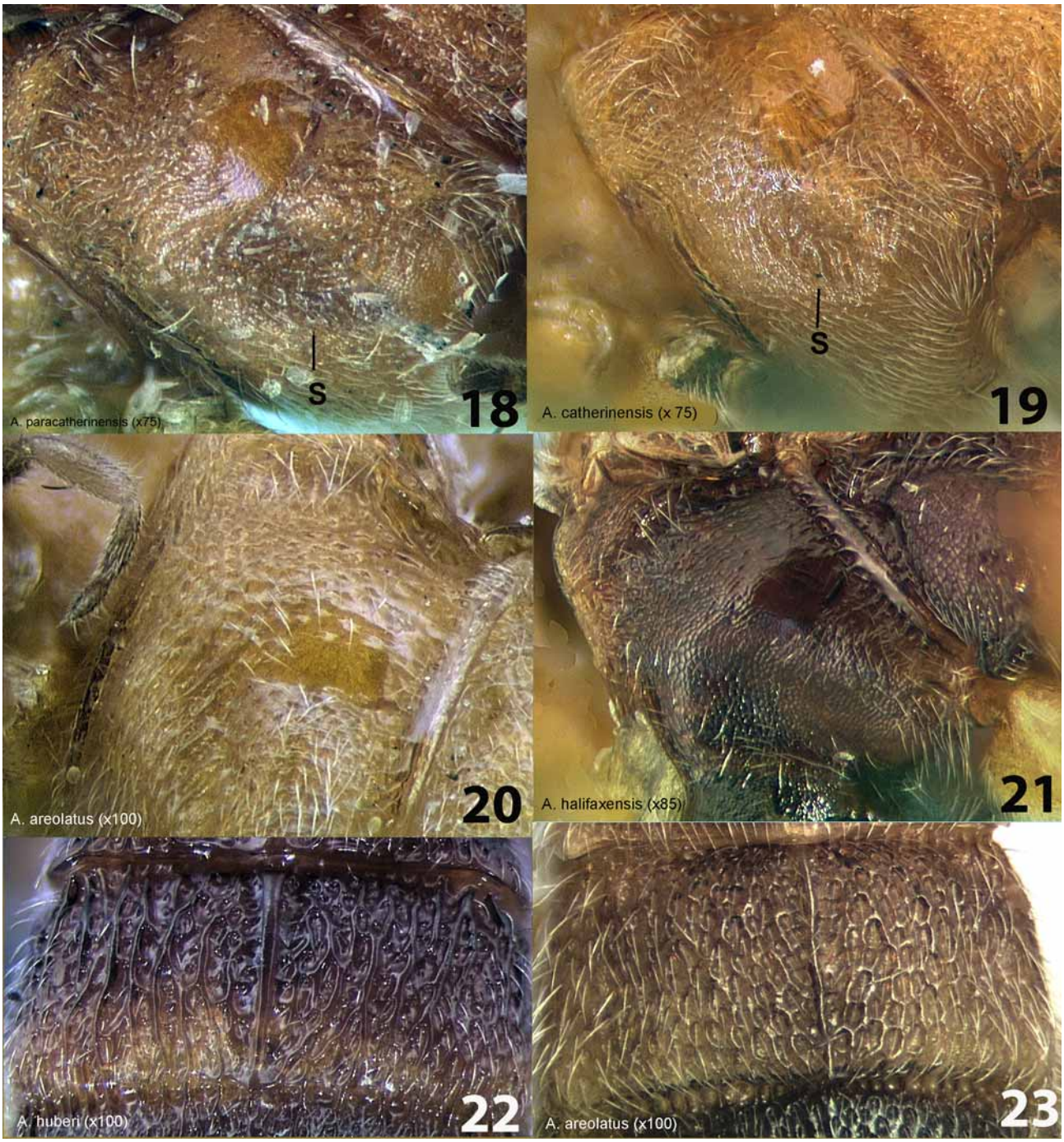

PLATE 7. FIGURES 18–23. Variation in sculpturing patterns of the mesopleuron and metasomal tergite II in *Aleiodes* (*Tetrasphaeropyx*) species**.** Figs. 18–21, mesopleuron. S = precoxal sulcus. 18, *A. paracatherinensis*. 19, *A. catherinensis*. 20, *A. areolatus*; 21, *A. halifaxensis*. Figs. 22–23, metasomal tergite II**.** 22, *A. huberi;* 23, *A. areolatus.*

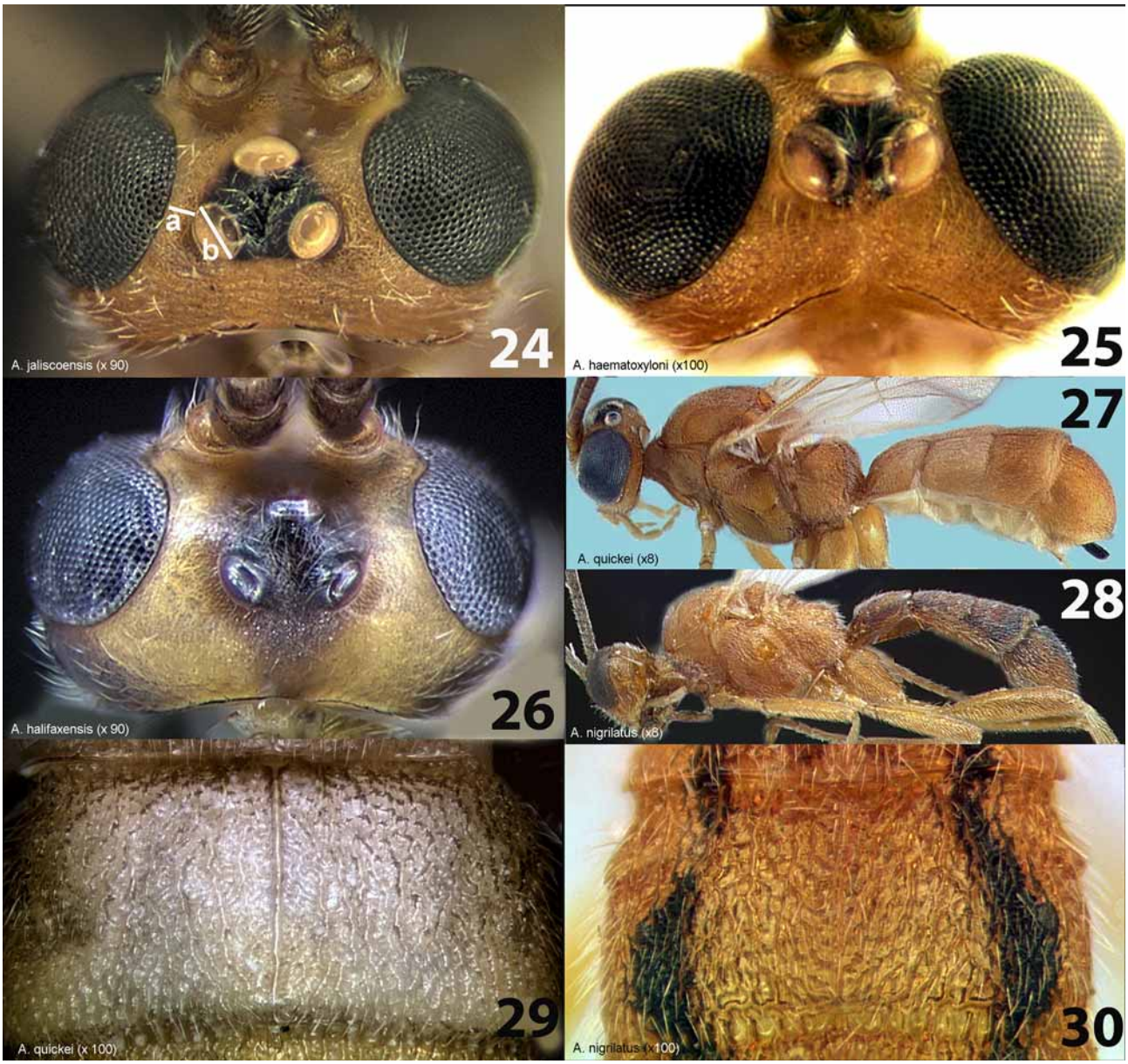

PLATE 8. FIGURES 24–30. Variation in *Aleiodes* (*Tetrasphaeropyx*) species**.** Figs. 24–26, vertex. 24, *A. jaliscoensis*. a: inter-ocellar space; b: longest diameter of lateral ocellus*;* 25, *A. haematoxyloni;* 26, *A. halifaxensis*. Figs. 27–28, habitus. 27, *A. quickei*; 28, *A. nigrilatus*. Figs. 29–30, tergite II. 29, *A. quickei;* 30, *A. nigrilatus.*

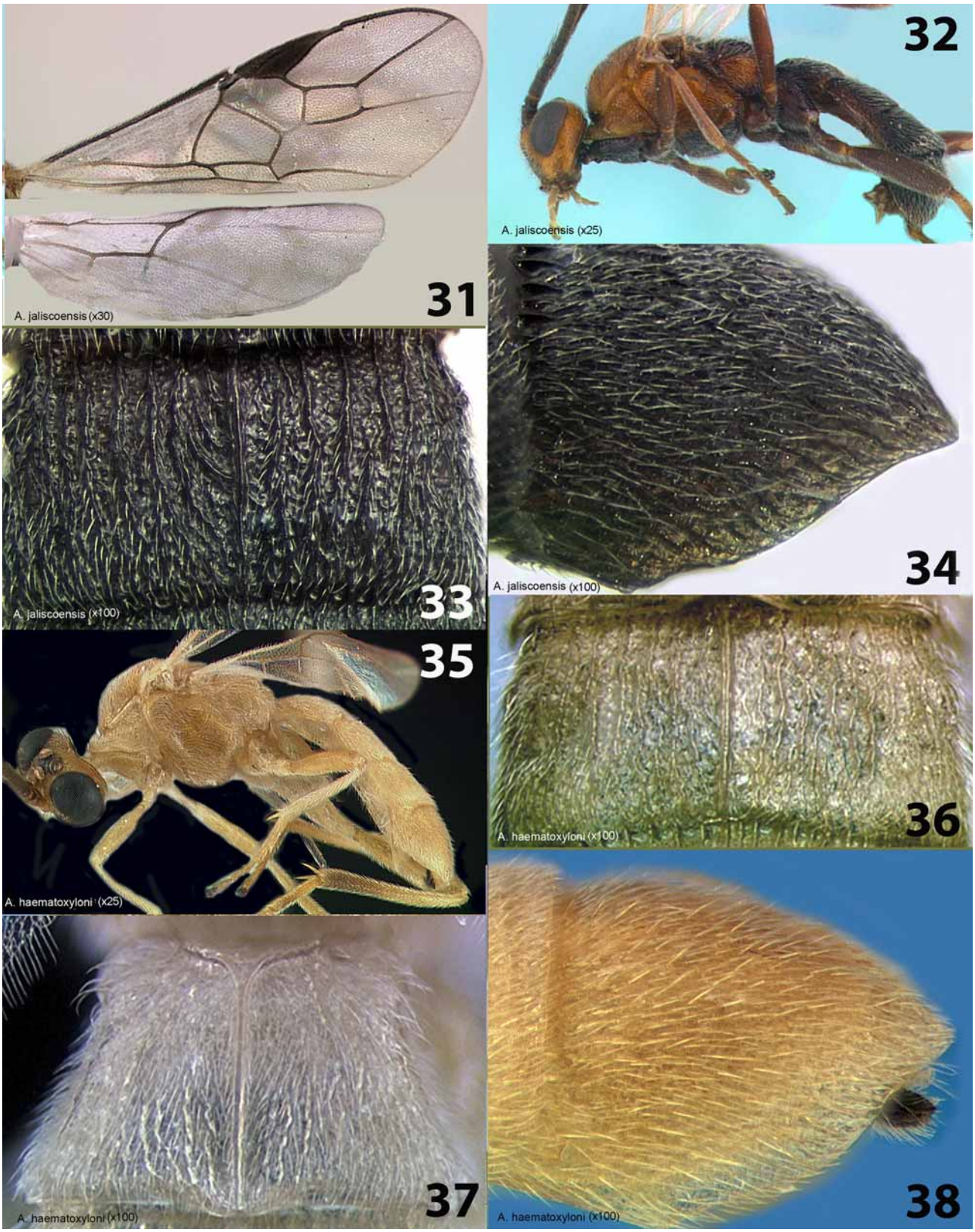

PLATE 9. FIGURES 31–38. Morphological features of *Aleiodes* (*Tetrasphaeropyx*) *jaliscoensis* and *A. (T.) haematoxyloni*. Figs 31–34, *A. jaliscoensis*. 31, wings; 32, habitus; 33, metasomal tergite II; 34, metasomal tergite IV (carapace). Figs. 35–38, *A. haematoxyloni*. 35, habitus; 36, tergite II; 37, metasomal tergite I; 38, metasomal tergite IV (carapace).

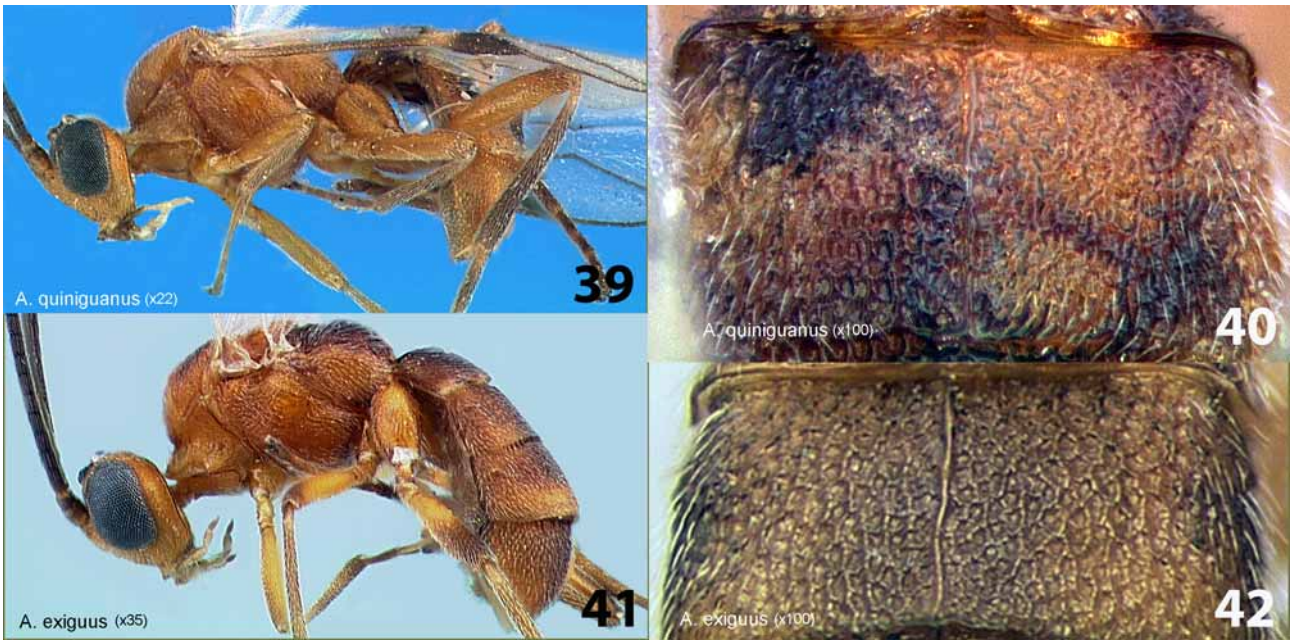

PLATE 10. FIGURES 39–42. Morphological features of *Aleiodes* (*Tetrasphaeropyx*) *quiniguanus* and *A.* (*T.*) *exiguus*. Figs. 39–40, *A. quiniguanus*. 39, habitus; 40, metasomal tergite II. Figs. 41–42, *A. exiguus*. 41, habitus; 42, metasomal tergite II.

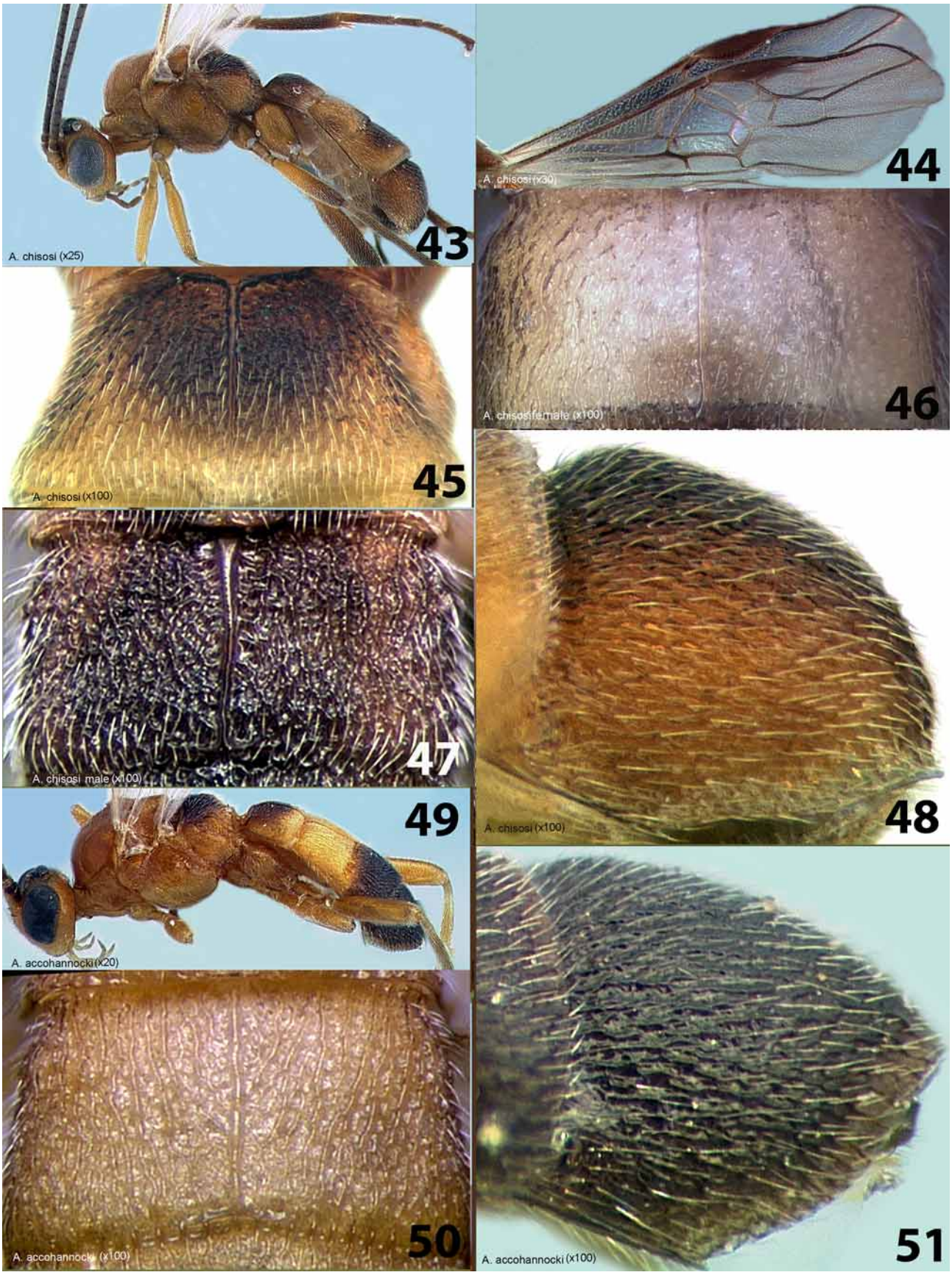

PLATE 11. FIGURES 43–51. Morphological features of and variation between *Aleiodes* (*Tetrasphaeropyx*) *chisosi* and *A.* (*T.*) *accohannocki*. Figs. 43–48, *A. chisosi*. 43, habitus; 44, forewing; 45, tergite I, female; 46, tergite II, female; 47, tergite II, male; 48, tergite IV (carapace), female. Figs. 49–51, *A. accohannocki*. 49, habitus; 50, tergite II; 51, tergite IV.

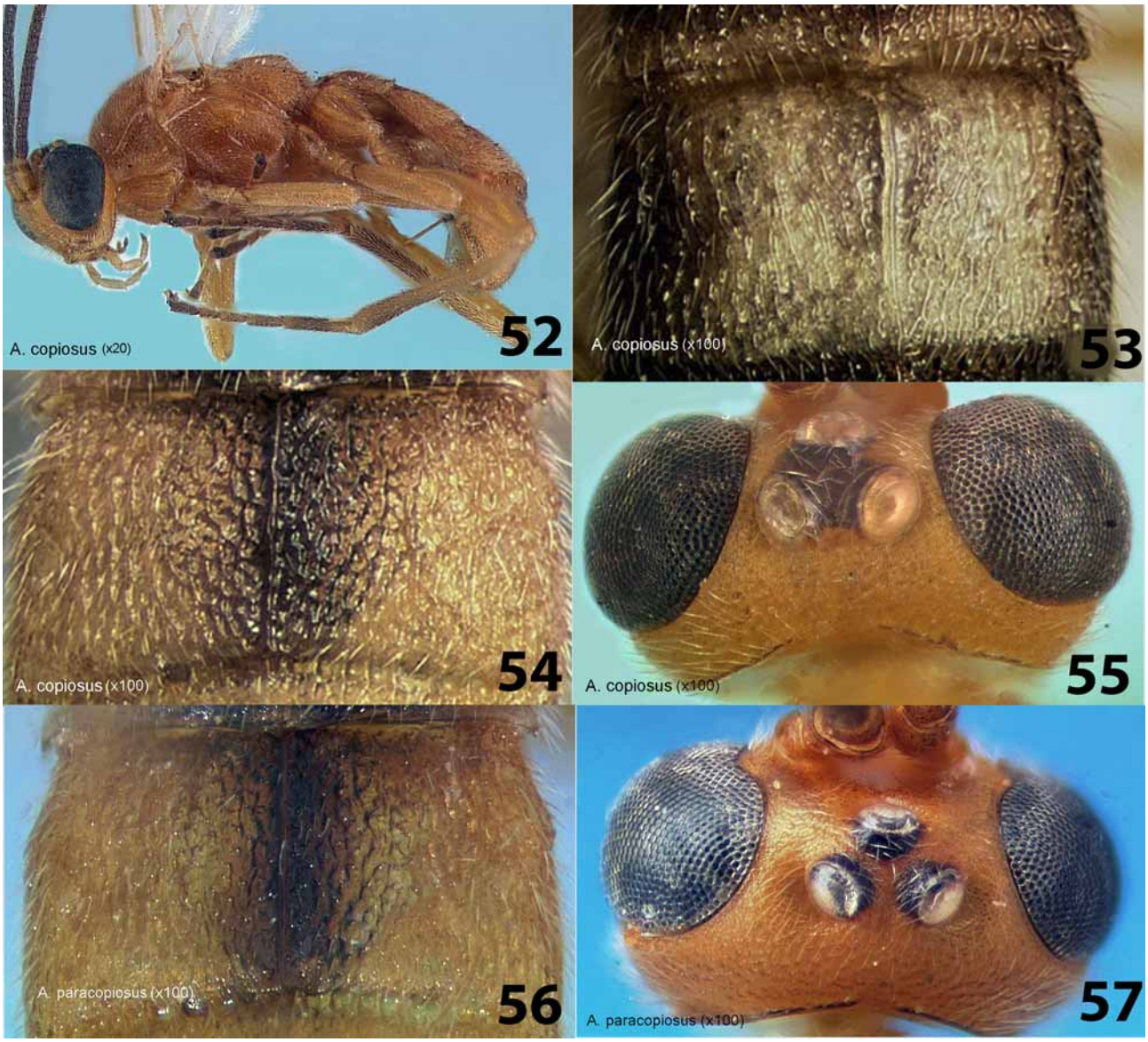

PLATE 12. FIGURES 52–57. Morphological variation in *Aleiodes* (*Tetrasphaeropyx*) *copiosus* and between *A.* (*T.*) *copiosus* and *A.* (*T.*) *paracopiosus*. Figures 52–55, *A. copiosus*. 52, habitus; 53–54, variation in metasomal tergite II; 55, vertex; Figures 56–57, *A. paracopiosus*. 56, tergite II; 57, vertex.

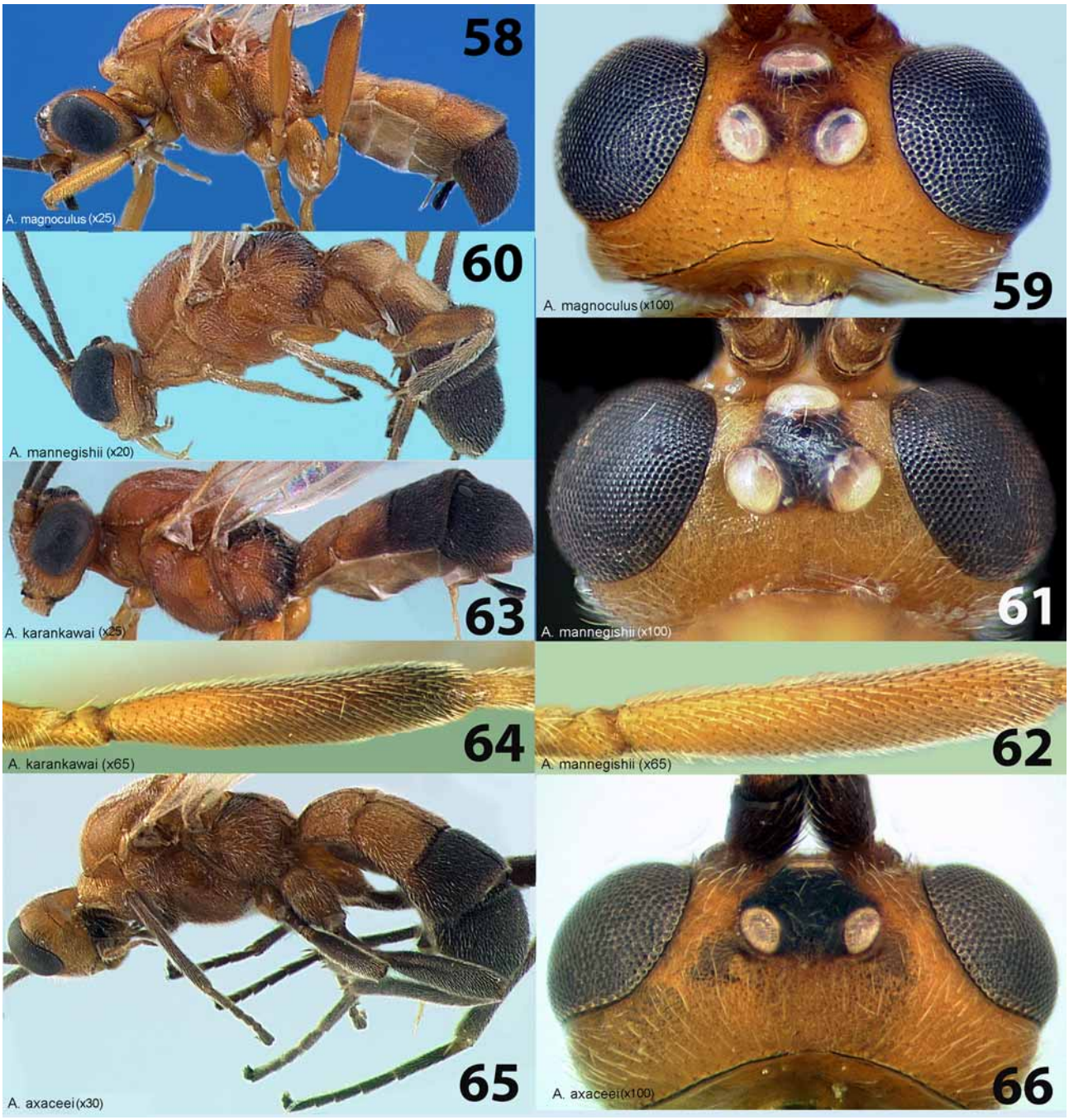

PLATE 13. FIGURES 58–66. Morphological features of and variation in *Aleiodes* (*Tetrasphaeropyx*) species. Figs. 58–59, *A. magnoculus*. 58, habitus; 59, vertex. Figs. 60–62, *A. mannegishii***.** 60, habitus; 61, vertex; 62, hind femur. Figs. 63–64, *A. karankawai*. 63, habitus; 64, hind femur. Figs. 65–66, *A. axaceeni*. 65, habitus; 66, vertex.

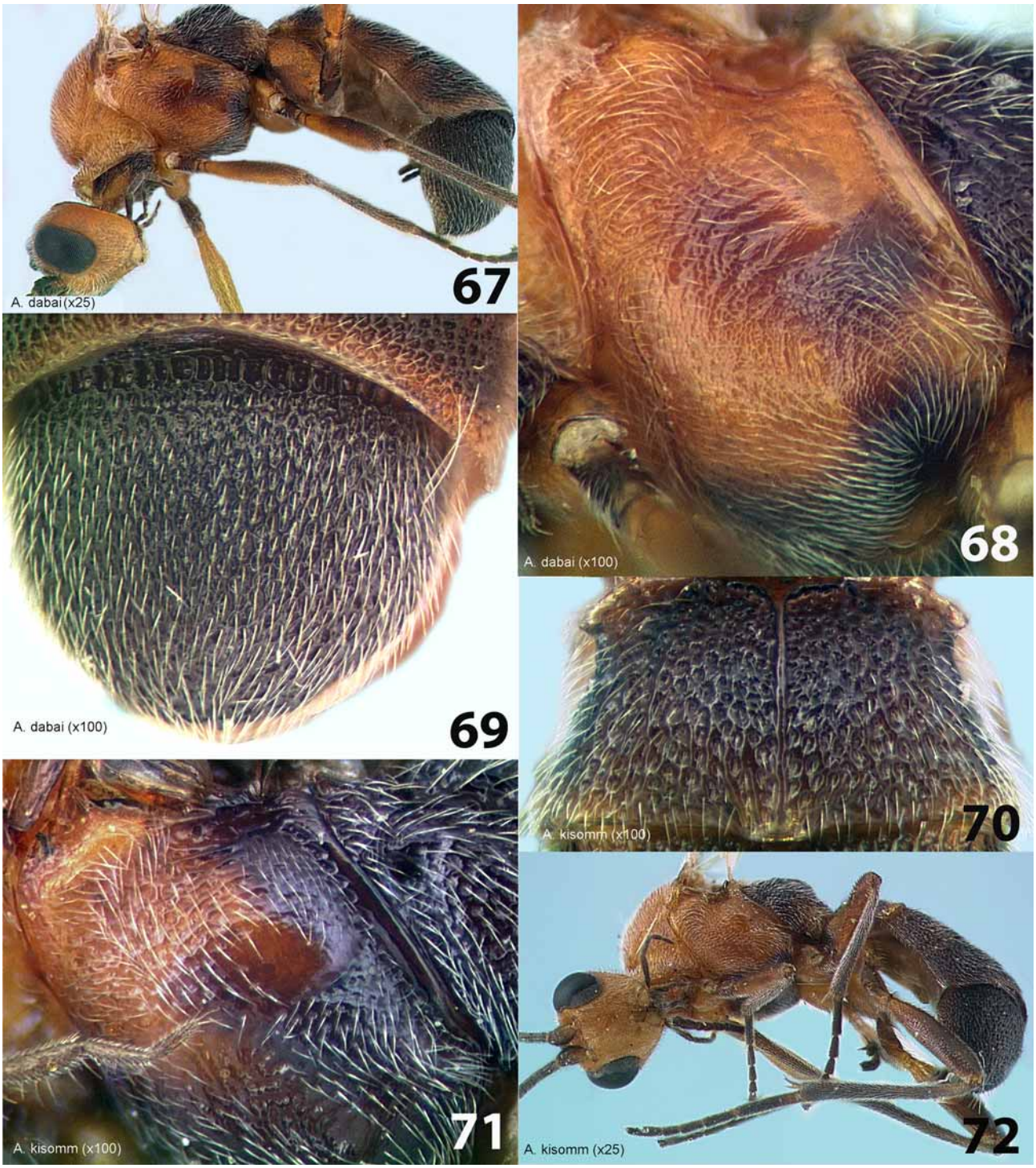

PLATE 14. FIGURES 67–72. Morphological features of and variation between *Aleiode*s (*Tetrasphaeropyx*) *dabai* and *A.* (*T.*) *kisomm*. Figs. 67–69, *A. dabai*. 67, habitus; 68, mesopleuron; 69, metasomal tergite IV (carapace). Figs. 70–72, *A. kisomm*. 70, tergite I; 71, mesopleuron; 72, habitus.

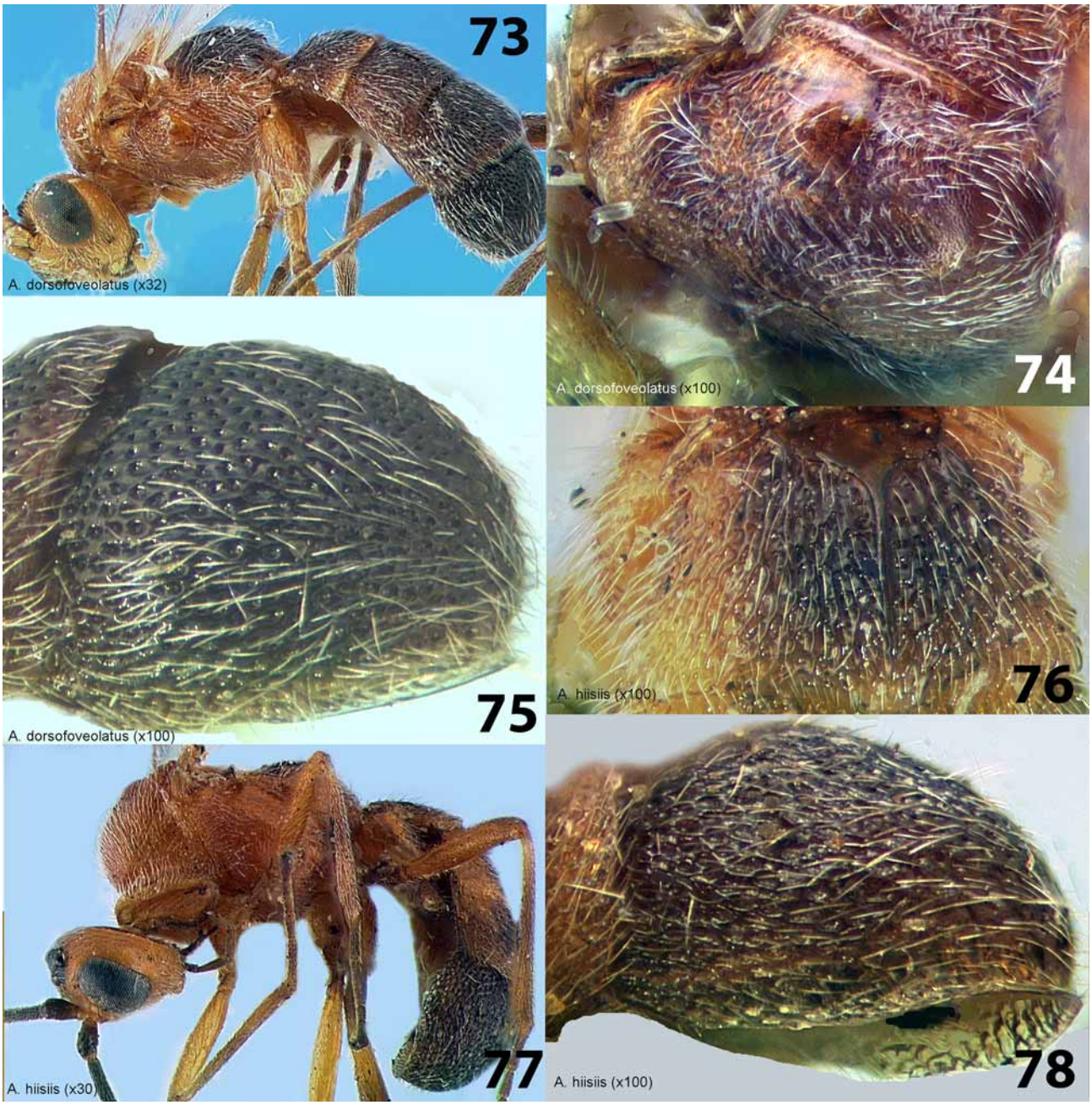

PLATE 15. FIGURES 73–78. Morphological features of and variation between *Aleiodes* (*Tetrasphaeropyx*) *dorsofoveolatus* and *A.* (*T.*) *hiisiis*. Figs. 73–75, *A. dorsofoveolatus*. 73, habitus; 74, mesopleuron; 75, tergite IV. Figs. 76–78, *A. hiisiis*. 76, tergite I; 77, habitus; 78, tergite IV.

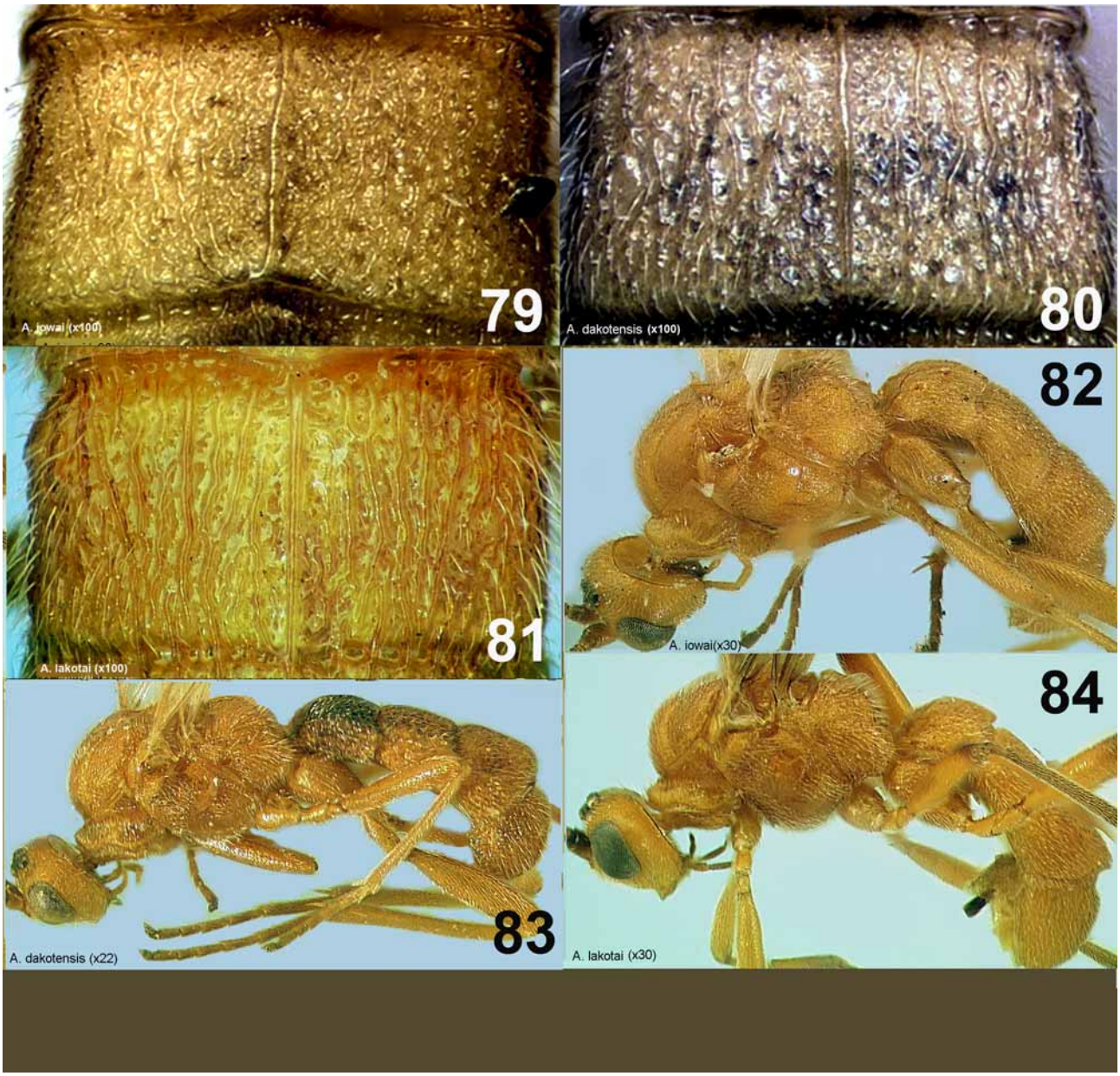

PLATE 16. FIGURES 79–84. Variation in metasomal tergite II and habitus between *Aleiodes* (*Tetrasphaeropyx*) species. Figs. 79–81, metasomal tergite II. 79, *A. iowensis;* 80, *A. dakotensis;* 81, *A. wicayazipa*. Figs. 82–84, habitus. 82, *A. iowensis*; 83, *A. dakotensis*; 84, *A. wicayazipa.*

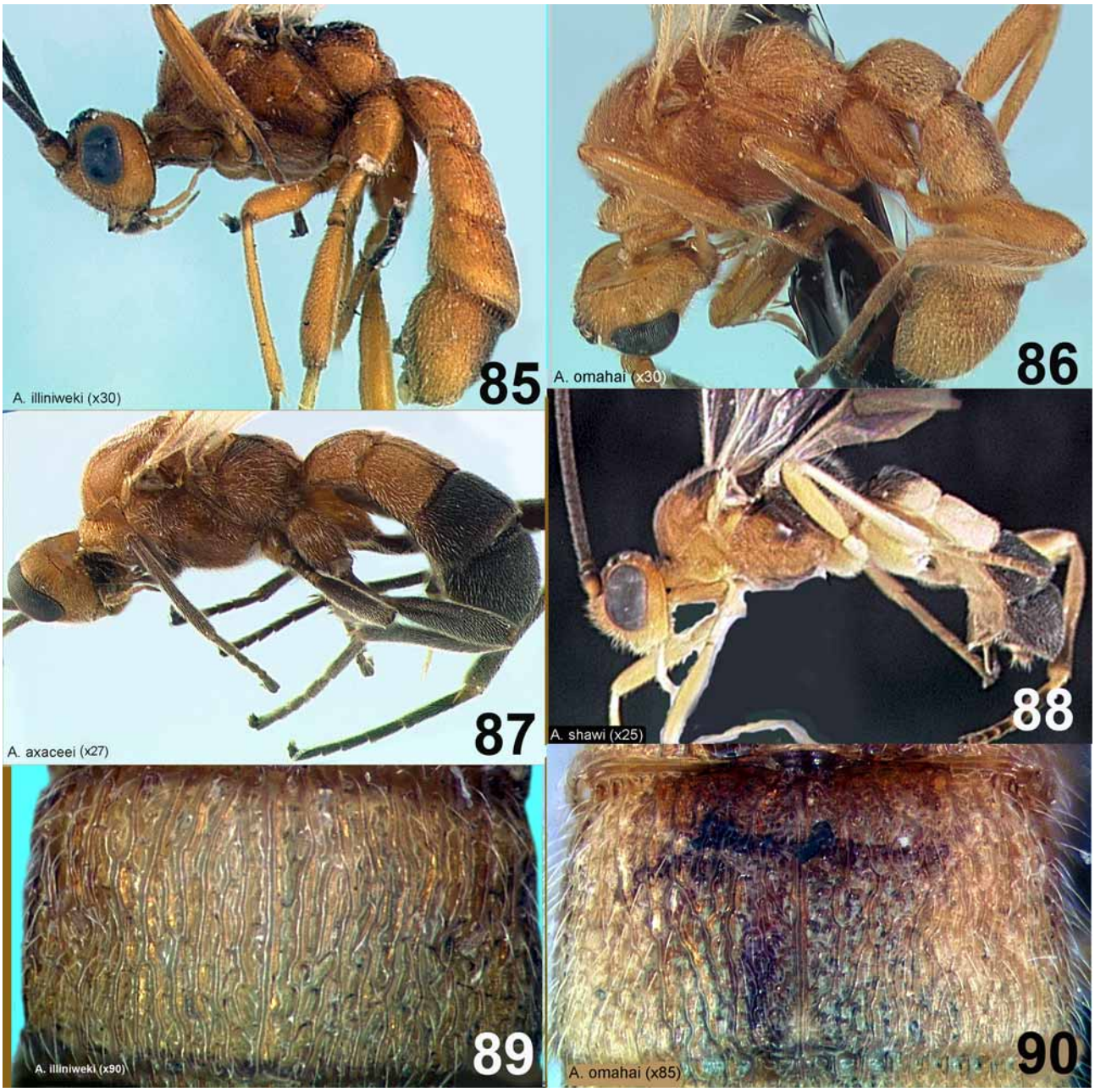

PLATE 17. FIGURES 85–90. Variation in habitus and metasomal tergite II among *Aleiodes* (*Tetrasphaeropyx*) species. Figs. 85–88, habitus. 85, *A. illiniweki;* 86, *A. min;* 87, *A. axaceei;* 88, *A. shawi*. Figs. 89–90, tergite II. 89, *A. illiniweki;* 90, *A. min.*

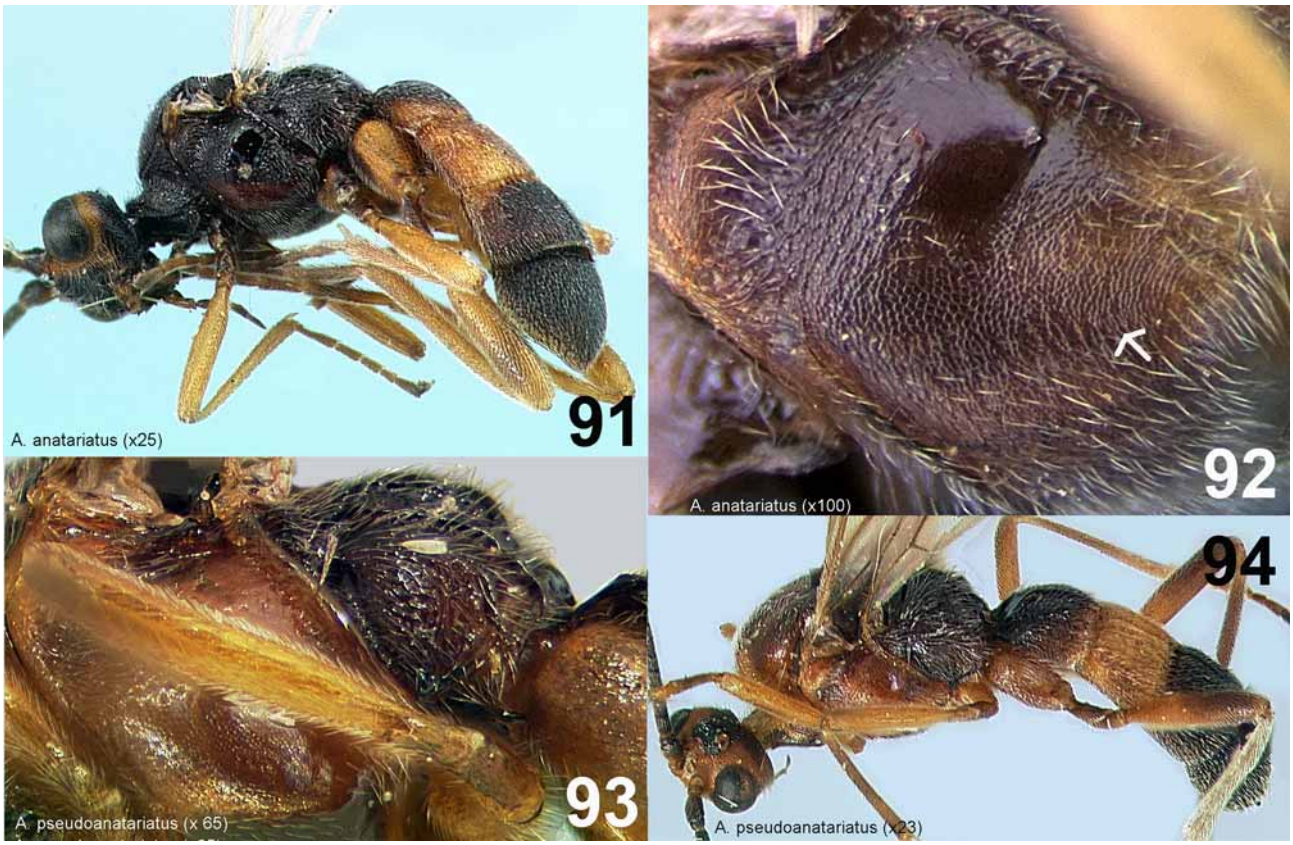

PLATE 18. FIGURES 91–94. Morphological variation between *Aleiodes* (*Tetrasphaeropyx*) *anatariatus* and *A.* (*T.*) *pseudoanatariatus*. Figs. 91–92, *A. anatariatus*. 91, habitus; 92, mesopleuron (arrow indicates coriaceous sculpturing). Figs. 93–94, *A. pseudoanatariatus*. 93, mesopleuron and metapleuron; 94, habitus.

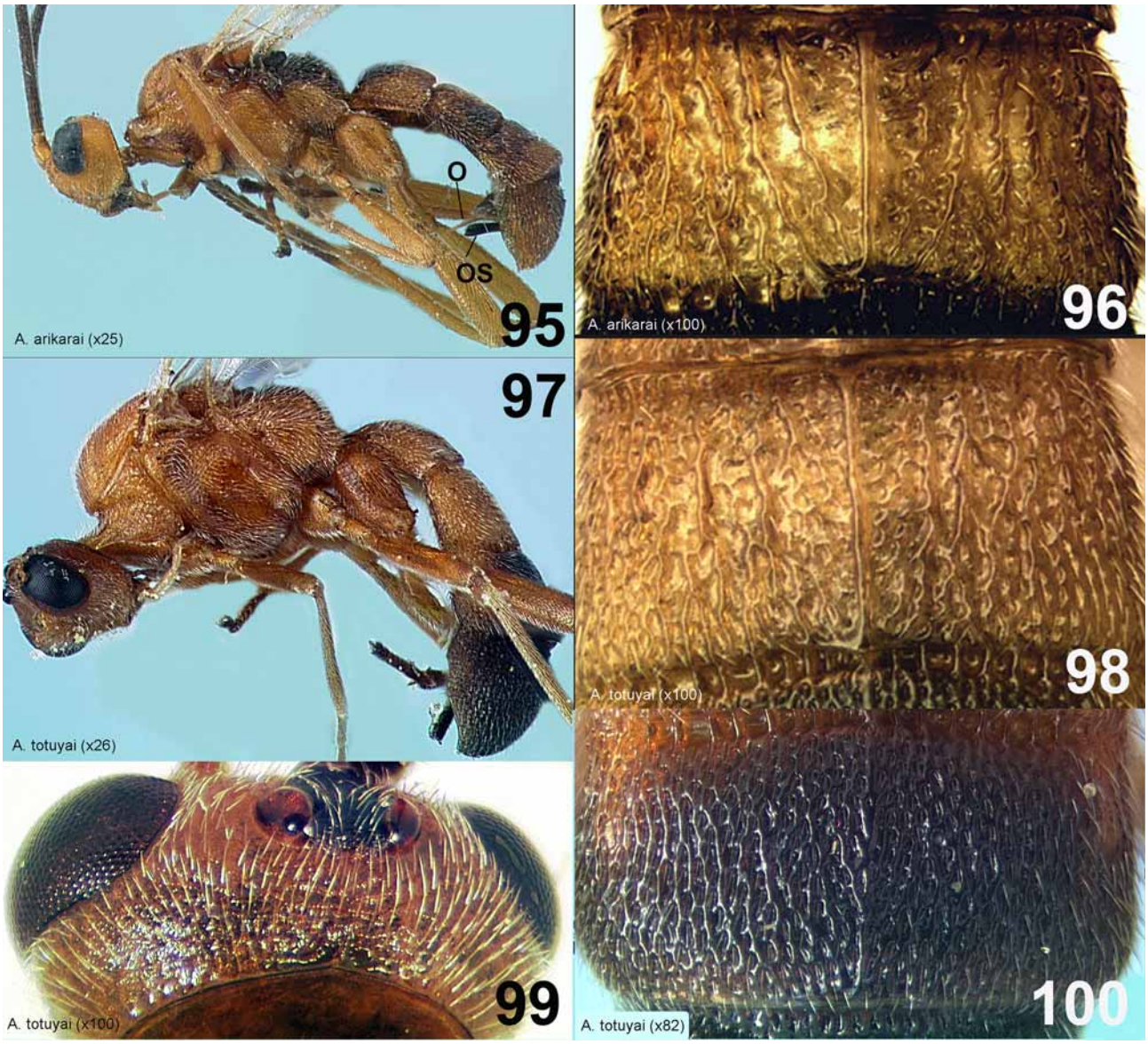

PLATE 19. FIGURES 95–100. Morphological features of and variation between *Aleiodes* (*Tetrasphaeropyx*) *arikari* and *A.* (*T.*) *totuyai*. Figs. 95–96, *A. arikari*. 95, habitus (O = ovipositor, OS = ovipositor sheath); 96, metasomal tergite II. Figs. 97–100, *A. totuyai*. 97, habitus; 98, metasomal tergite II; 99, vertex; 100, metasomal tergite III.

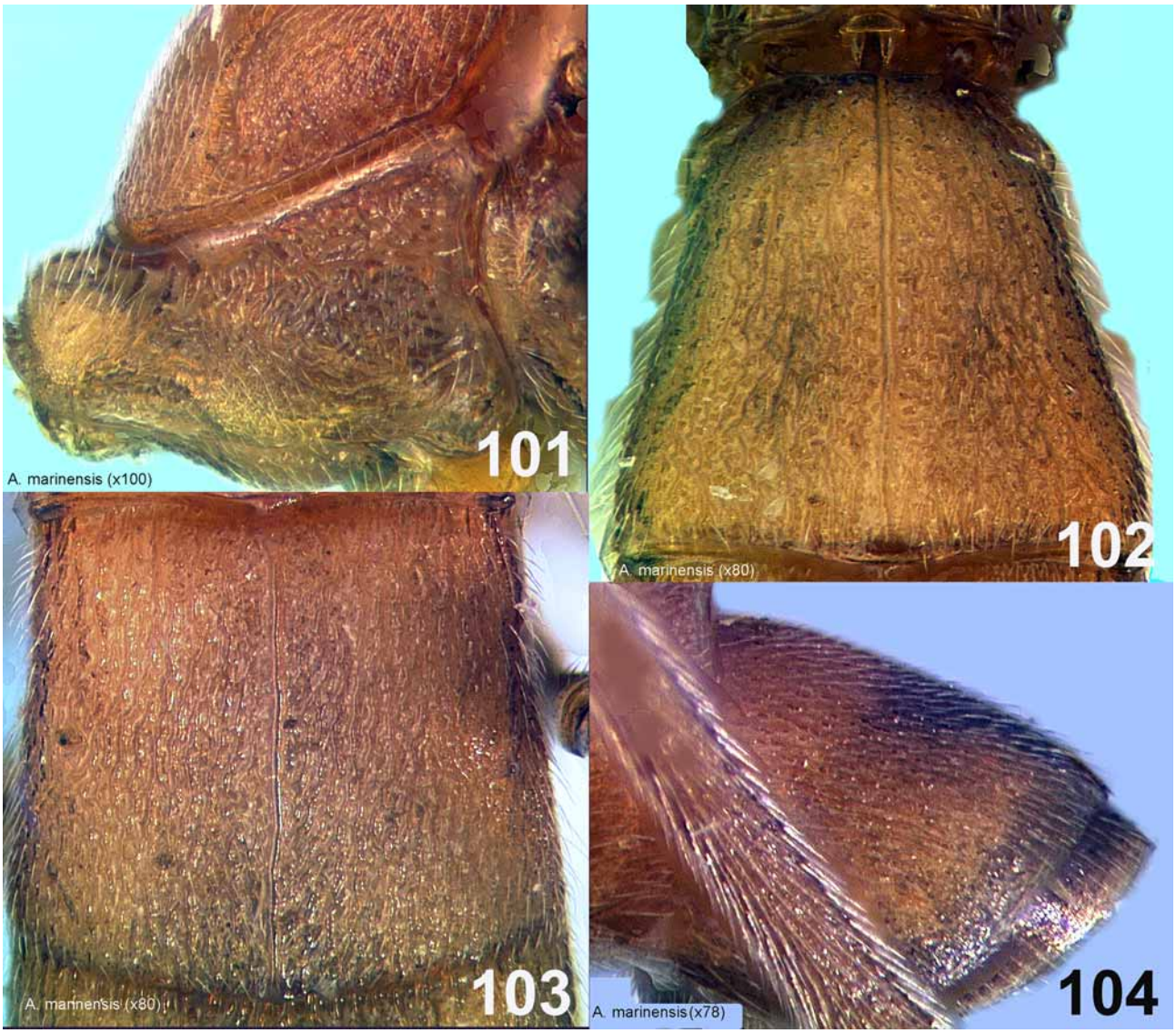

PLATE 20. FIGURES 101–104. Morphological features of *Aleiodes* (*Tetrasphaeropyx*) *marinensis*. 101, pronotum; 102, metasomal tergite I; 103, metasomal tergite II; 104, metasomal tergite IV (carapace).

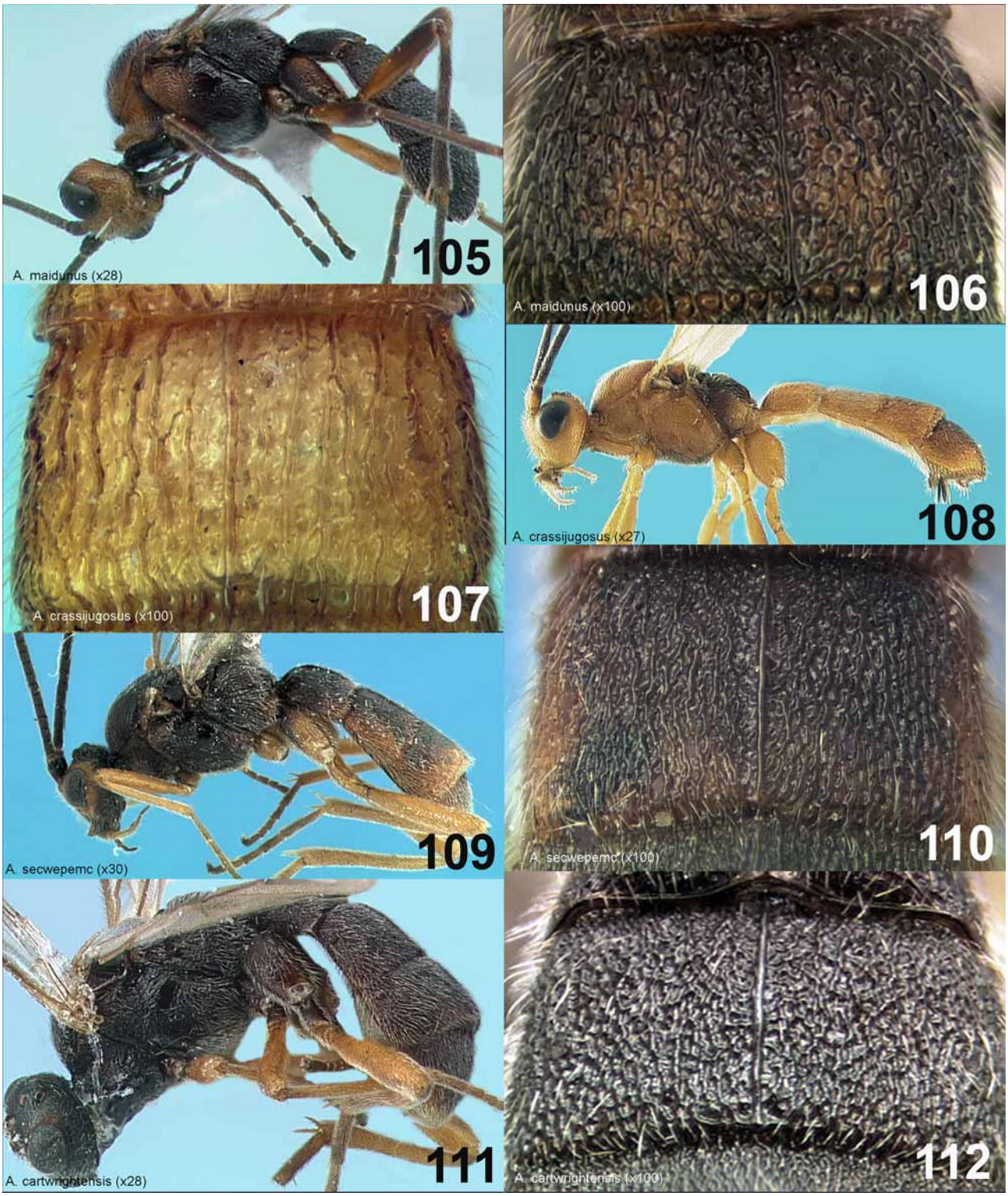

PLATE 21. FIGURES 105–112. Variation among *Aleiodes* (*Tetrasphaeropyx*) species in habitus and sculpturing of metasomal tergite II. Figs. 105–106, *A. maidunus*. 105, habitus; 106, tergite II. Figs. 107–108, *A. crassijugosus*. 107, tergite II; 108, habitus. Figs. 109–110, *A. secwepemc*. 109, habitus; 110, tergite II. Figs. 111–112, *A. cartwrightensis*. 111, habitus; 112, tergite II.

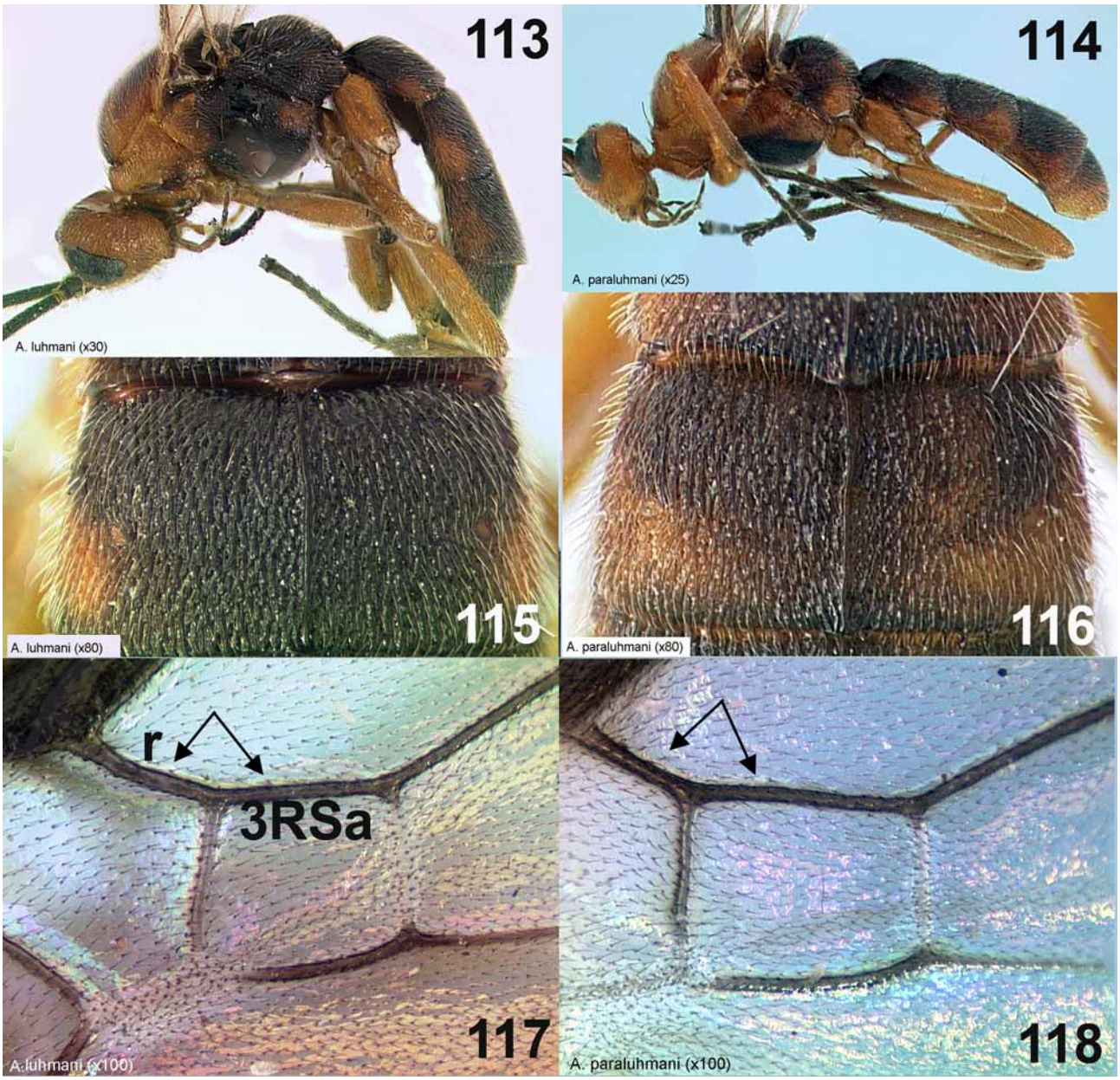

PLATE 22. FIGURES 113–118. Morphological variation between *Aleiodes* (*Tetrasphaeropyx*) *luhmani* and *A.* (*T.*) *paraluhmani*. Figs. 113–114, habitus**.** 113, *A. luhmani*; 114, *A. paraluhmani.* Figs. 115–116, metasomal tergite II. 115, *A. luhmani*; 116, *A. paraluhmani.* Figs. 117–118, forewing veins r and 3RSA relative lengths. 117, *A. luhmani*; 118, *A. paraluhmani*.

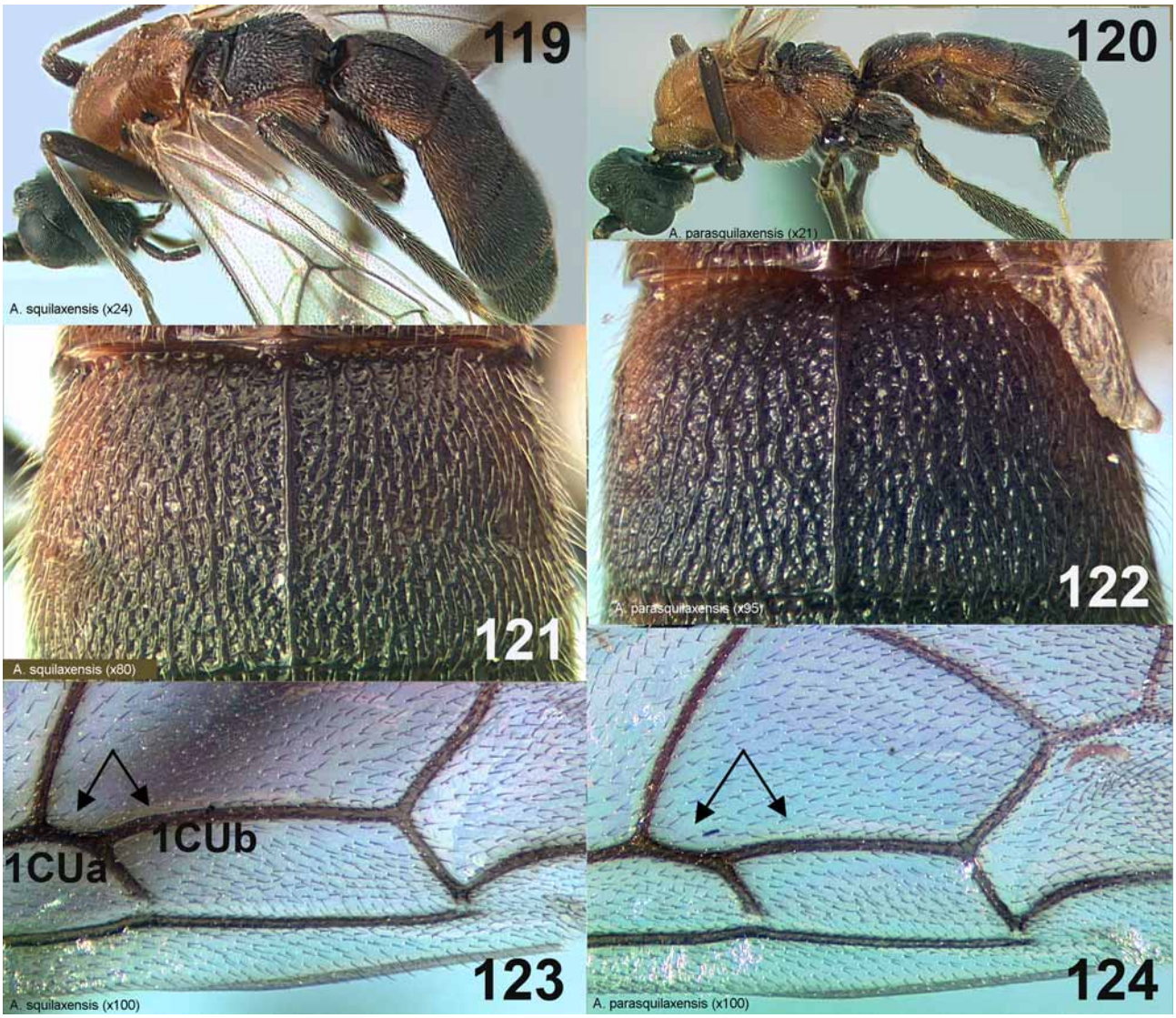

PLATE 23. FIGURES 119–124. Morphological features of and variation between *Aleiodes* (*Tetrasphaeropyx*) *squilaxensis* and *A.* (*T.*) *parasquilaxensis*. Figs. 119–120, habitus. 119, *A. squilaxensis*; 120, *A. parasquilaxensis*. Figs. 121–122, metasomal tergite II. 121, *A. squilaxensis*; 122, *A. parasquilaxensis.* Figs. 123–124, forewing veins 1CUa and 1Cub relative lengths. 123, *A. squilaxensis*; 124, *A. parasquilaxensis*.

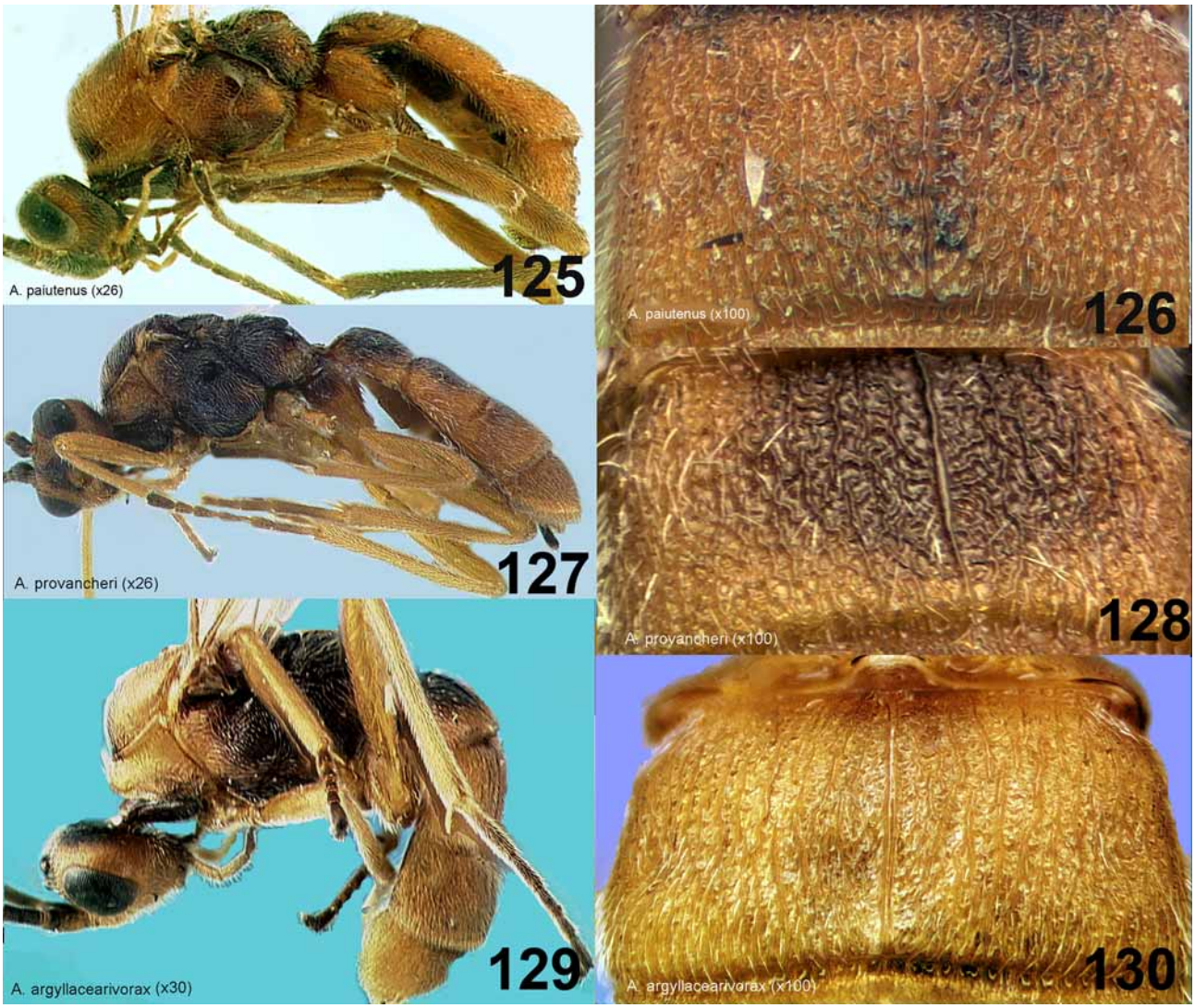

PLATE 24. FIGURES 125–130. Morphological features of and variation between *Aleiodes* (*Tetrasphaeropyx*) species. Figs. 125–126, *A. pooedooa*. 125, habitus; 126, metasomal tergite II. Figs. 127–128, *A. provancheri*. 127, habitus; 128, metasomal tergite II. Figs. 129–130, *A. argyllacearivorax*. 129, habitus; 130, metasomal tergite II.

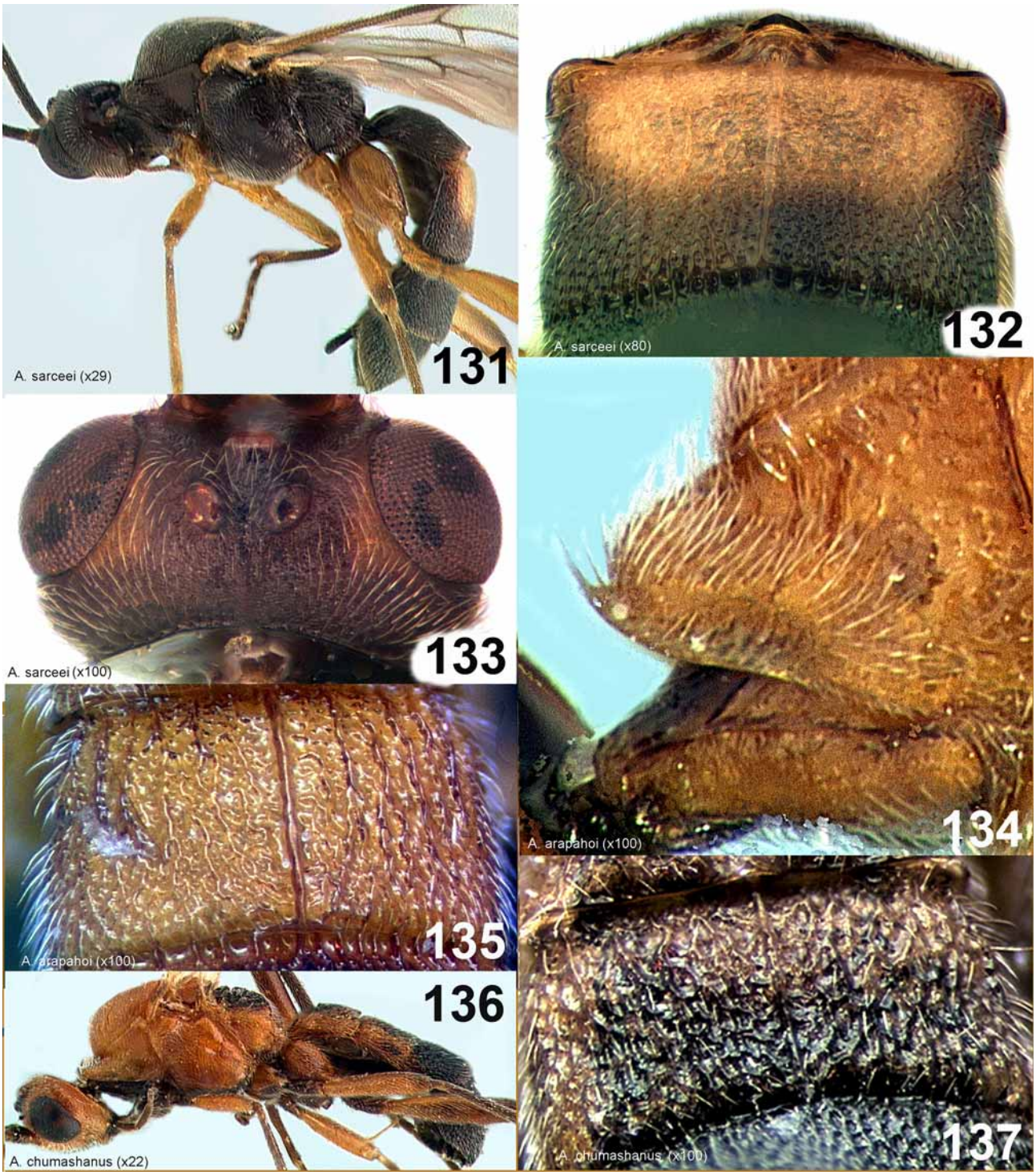

PLATE 25. FIGURES 131–137. Morphological features of and variation between *Aleiodes* (*Tetrasphaeropyx*) species. Figs. 131–133, *A. sarceei*. 131, habitus; 132, tergite II; 133, vertex. Figs. 134–135, *A. kohook*. 134, lateral view of pronotum; 135, metasomal tergite II. Figs. 136–137, *A. chumashanus*. 136, habitus; 137, metasomal tergite II.

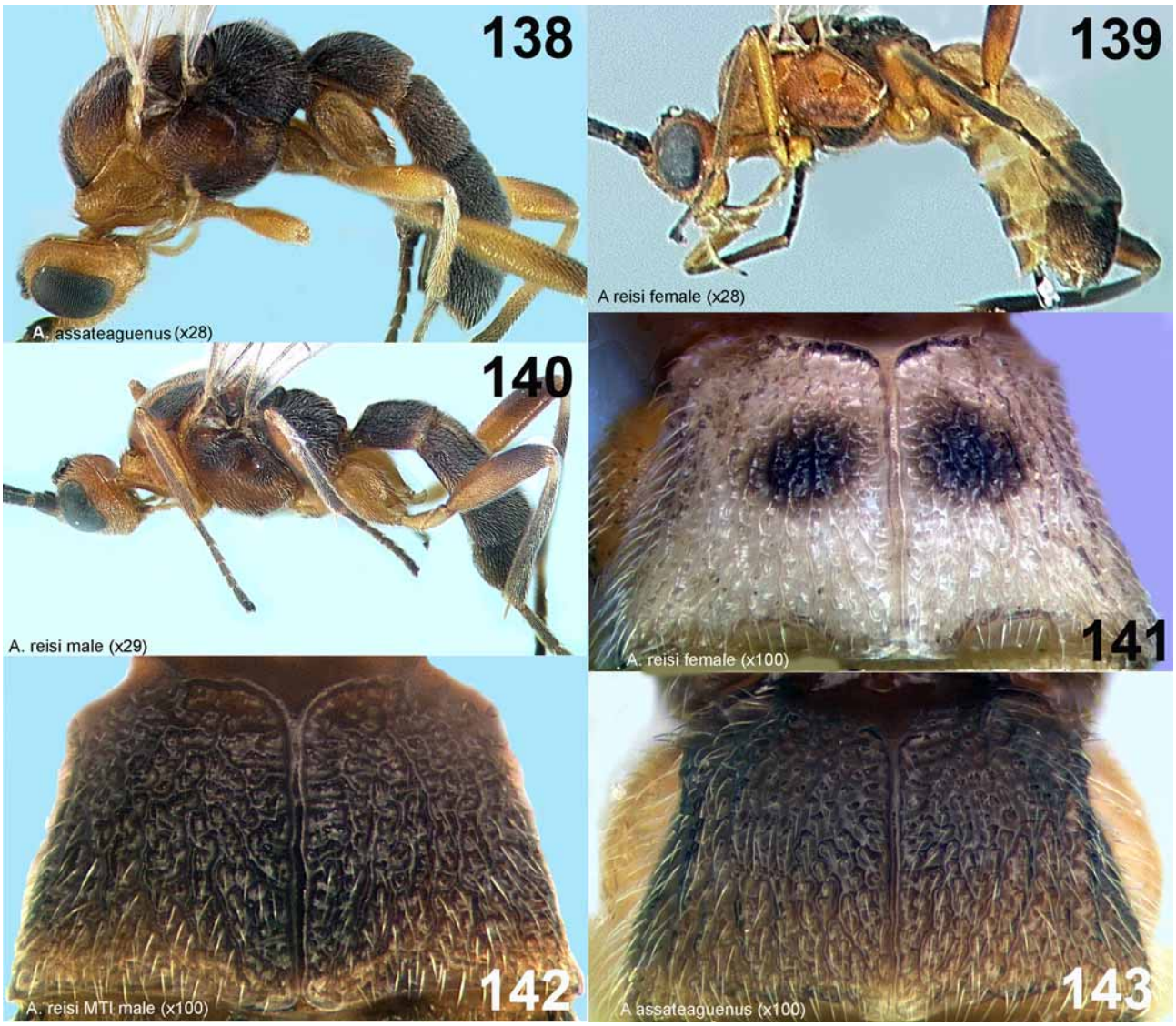

PLATE 26. FIGURES 138–143. Morphological features of *Aleiodes* (*Tetrasphaeropyx*) species. Figs. 138–140, habitus. 138, *A. assateaguenus*; 139, *A. reisi*, *female;* 140, *A. reisi*, *male*. Figs. 141–143, metasomal tergite I. 141, *A. reisi*, female*;* 142, *A. reisi*, male; 143, *A. assateaguenus*.

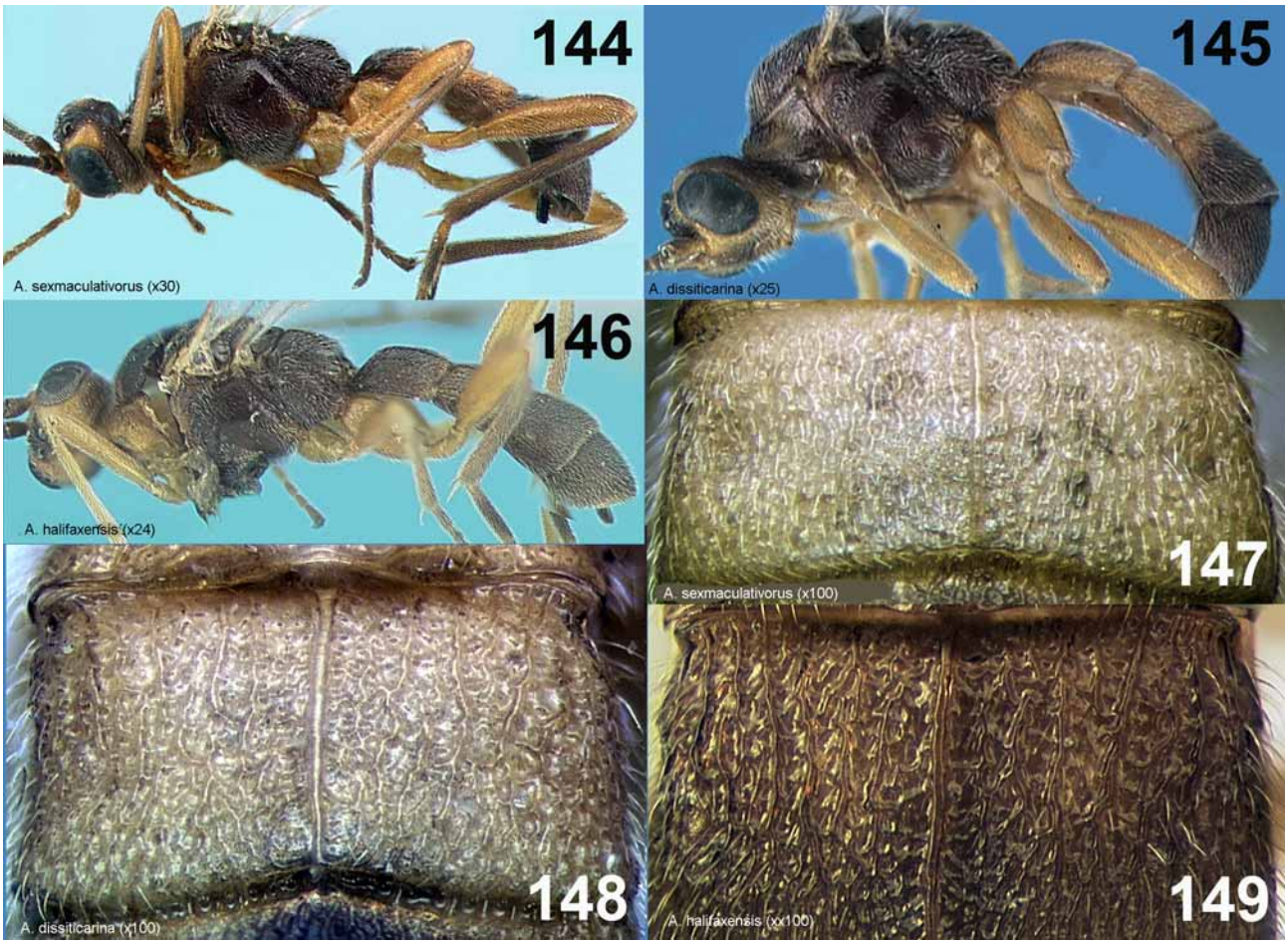

PLATE 27. FIGURES 144–149. Morphological variation between *Aleiodes* (*Tetrasphaeropyx*) species in habitus and metasomal tergite II features. Figs. 144–146, habitus. 144, *A. sexmaculativorax*; 145, *A. dissiticarina*; 146, *A. halifaxensis*. Figs. 147–149, metasomal tergite II. 147, *A. sexmaculativorax*; 148, *A. dissiticarina*; 149, *A. halifaxensis*.

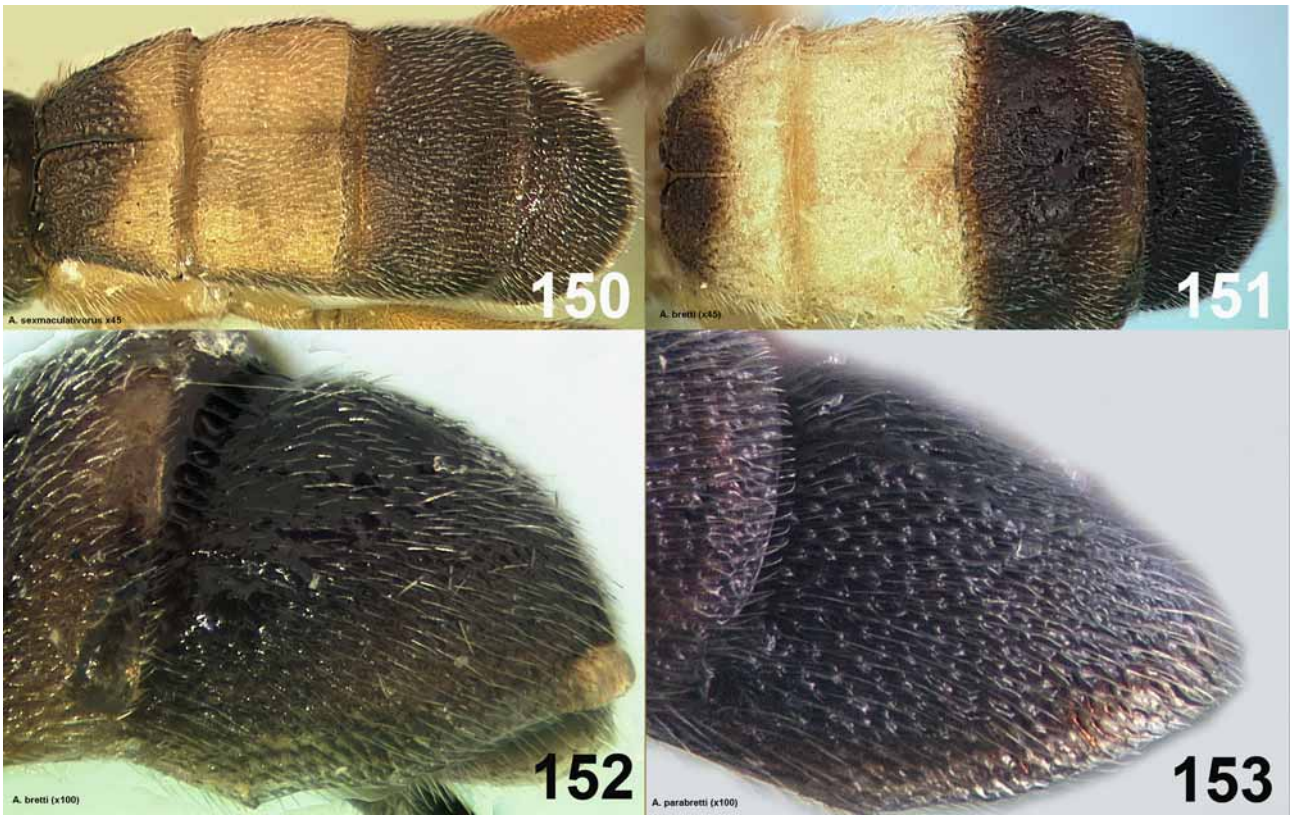

PLATE 28. FIGURES 150–153. Morphological variation between *Aleiodes* (*Tetrasphaeropyx*) species in metasomal color pattern and metasomal tergite IV (carapace) shape. Figs. 150–151, metasomal color pattern. 150, *A. sexmaculativorax;* 151, *A. bretti*. Figs. 152–153, metasomal tergite IV, lateral view. 152, *A. bretti;* 153, *A. parabretti*.

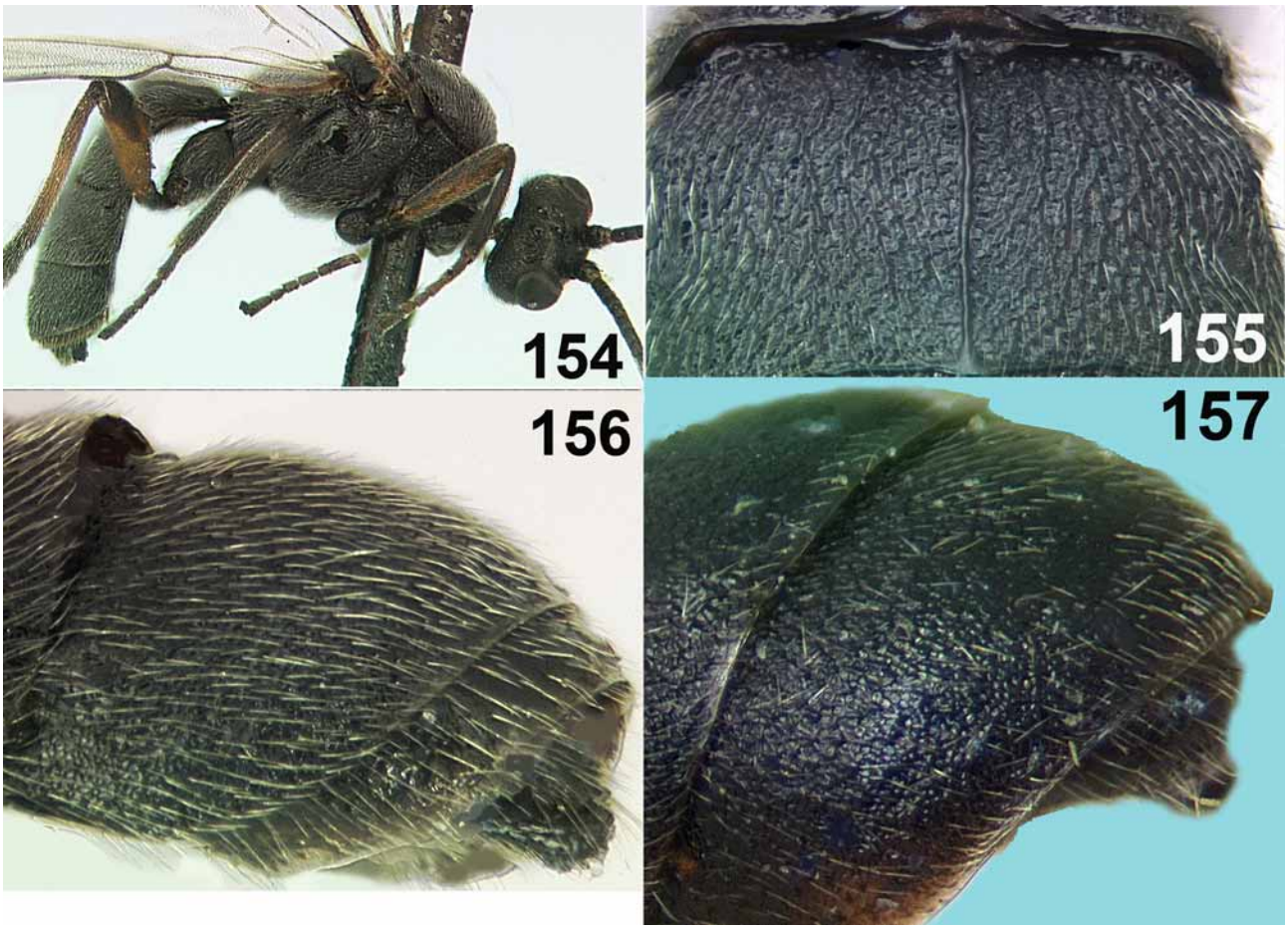

PLATE 29. FIGURES 154–157. Features of *Aleiodes* (*Tetrasphaeropyx*) species. 154–156. *Aleiodes* (*Tetrasphaeropyx*) *tullyi*. 154, habitus; 155, metasomal tergite II; 156, lateral view of metasomal tergite IV (carapace). Note that carapace is shallow, internal angle of curvature greater than 90°, and not entirely covering an apical tergite. 157. *Aleiodes arcticus*, metasomal tergite IV.