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Revision of North American *Aleiodes* (Part 9): the *pallidator* (Thunberg) species-group with description of two new species (Hymenoptera: Braconidae, Rogadinae)

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Abstract

The *Aleiodes pallidator* species-group is defined, and an identification key is provided for the five species known to occur in the U.S.A. and Canada. Two new species are described: *Aleiodes martini* Shaw and Marsh, from Florida, and *A. xanthoclypeus* Shaw and Marsh, known from Canada and Wisconsin, and reared from Lymantriidae species including *Dasychira plagiata* (Walker) and *Olene grisefacta* (a new host record for the genus *Aleiodes*). Five species are illustrated, and their host associations are summarized.

Key words: Nearctic, parasitoid, Lymantriidae, gypsy moth, new host records

Introduction

The rogadine braconid genus *Aleiodes* Wesmael is worldwide in distribution, but is particularly species-rich across the Holarctic Region (S. Shaw 2006). *Aleiodes* is well-diversified in North America, with at least 90 species in the United States and Canada (S. Shaw *et al*. 1997). This study is the ninth in a series of papers on *Aleiodes* species-groups, intended to provide a complete revision of the genus for North America (see S. Shaw *et al*. 1997, 1998a, 1998b, 2006; Marsh and S. Shaw 1998, 1999, 2001, 2003; Shaw and Marsh 2004). The purpose of this paper is to provide a taxonomic revision of the *pallidator* species-group, a monophyletic lineage of *Aleiodes* that is distinguished by its large ocelli with the diameter of the lateral ocellus greater than ocellar-ocular distance (Figs 1, 6, 10, 13, 18), hind wing vein RS sinuate with marginal cell narrowest in middle (Figs 4, 16), and tarsal claws either entirely pectinate to apex (Fig. 12) or with strong pre-apical spines (Fig. 3) (Fortier and Shaw 1999). The *pallidator* species-group is of particular interest to forest ecologists and park managers since it includes parasitoids of potential woodland pests such as tussock moth (Fig. 27) and gypsy moth (Fig. 24). Three of the species discussed in this paper were introduced to the United States as biological control agents for suppressing the gypsy moth (Shaw 2006).

Aleiodes species are koinobiont endoparasitoids of lepidopterous larvae, especially macrolepidoptera of the superfamilies Noctuoidea and Geometroidea, and to a lesser extent, Arctioidea, Sphingoidea and Papilionoidea (S. Shaw *et al*. 1997; Shaw 2006). So far as is known, the species of the *pallidator* species-group, covered in this paper, are all parasitoids of Lymantriidae caterpillars. The method of parasitism, unique to the tribe Rogadini, is noteworthy: the *Aleiodes* larva completes its feeding and pupates within the shrunken and mummified remains of the host caterpillar (Figs 23–28). In most cases, the form of the mummy caused by a particular *Aleiodes* species is characteristic for that host and parasitoid, so mummified remains are of considerable diagnostic value and should be retained with the parasitoid when reared. For a more complete discussion of *Aleiodes* biology, readers may refer to M. Shaw (1983, 1994), M. Shaw and Huddleston (1991), S. Shaw (1995) S. Shaw *et al*. (1997), and S. Shaw (2006).

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Methods

Species covered in this paper can be identified as members of the subfamily Rogadinae using the keys of S. Shaw (1995), M. Shaw and Huddleston (1991) or Wharton *et al*. (1997). Our definition of *Aleiodes* follows that of M. Shaw (1983), van Achterberg (1991), S. Shaw *et al*. (1997) and S. Shaw (2006). Specimens can be determined as *Aleiodes* using the keys of van Achterberg (1991) or S. Shaw *et al*. (1997). The species-groups of North American *Aleiodes* can be keyed using the key provided in S. Shaw *et al*. (1997). Fortier (1997) provided a cladistic analysis of the *Aleiodes* species-groups. Species descriptions were prepared by SRS and PMM, therefore authorship of the new species is attributed to the first two authors. MAT assembled the illustration plates.

Terminology follows that used for *Aleiodes* by S. Shaw *et al*. (1997), S. Shaw (1993, 2006) and Marsh (1989). A glossary of relevant terminology is provided in S. Shaw (2006). Microsculpture terminology follows that of Harris (1979). Wing vein terminology agrees with the system adopted by Wharton *et al*. (1997) and agrees closely with that of Goulet and Huber (1993). Labeled diagrams of wing veins are provided in S. Shaw *et al*. (1997) and S. Shaw (2006). The specimens were observed using a Leica M80 microscope and the photos were taken using a Leica N205C microscope with Leica Application Suite Automontage Software.

Acronyms for collections providing specimens for this study, and where type material is deposited are as follows: AEI (American Entomological Institute, Gainesville, FL), BMNH (The Natural History Museum, London, UK), CNC (Canadian National Collection, Ottawa, Ontario, Canada), UWIM (University of Wyoming Insect Museum, University of Wyoming, Laramie, WY), USNM (National Museum of Natural History, Smithsonian Institution, Washington, DC). A list of other collections which provided *Aleiodes* specimens for the revision, but did not include *pallidator*-group species, is given in Shaw et al. (1997).

ALEIODES PALLIDATOR SPECIES-GROUP

Included Species: *pallidator* (Thunberg) 1822, Europe, introduced into North America; *lymantriae* (Watanabe) 1937, new combination, Japan, introduced into North America; *indiscretus* (Reardon) 1970, new combination, India, introduced into North America; *martini* new species, Florida; *xanthoclypeus* new species, Canada and northern U.S.A.

Distinguishing Characters. Eyes and ocelli large (Figs 1, 6, 10, 13, 18), diameter of lateral ocellus greater than ocell-ocular distance, lateral ocellus width usually at least 2x wider than ocell-ocular distance; malar space shorter than basal width of mandible (Figs 5, 9, 17); hind wing vein RS sinuate (Figs 4, 16), marginal cell narrowest in middle or near apical 2/3 distance from wing base; tarsal claws either entirely pectinate (Fig. 12) or with strong pre-apical spines along base of claw (Fig. 3); koinobiont parasitoids of Lymantriidae caterpillars (Figs 23–28).

Comments. The *pallidator* species-group was defined and discussed by Fortier and Shaw (1999). Species of this group are seldom collected as commonly as those of many other *Aleiodes* species-groups; however, they are very distinctive because of their exceptionally large ocelli (Figs 1, 6, 10, 13, 18). This is a small group of species, most of which are known to attack Lymantriidae caterpillars (Figs 23–28). Three Old World species have been released in North America as potential biological control agents for the gypsy moth (Fig. 24).

IDENTIFICATION KEY TO SPECIES OF THE *PALLIDATOR* SPECIES-GROUP IN THE U.S.A. AND CANADA

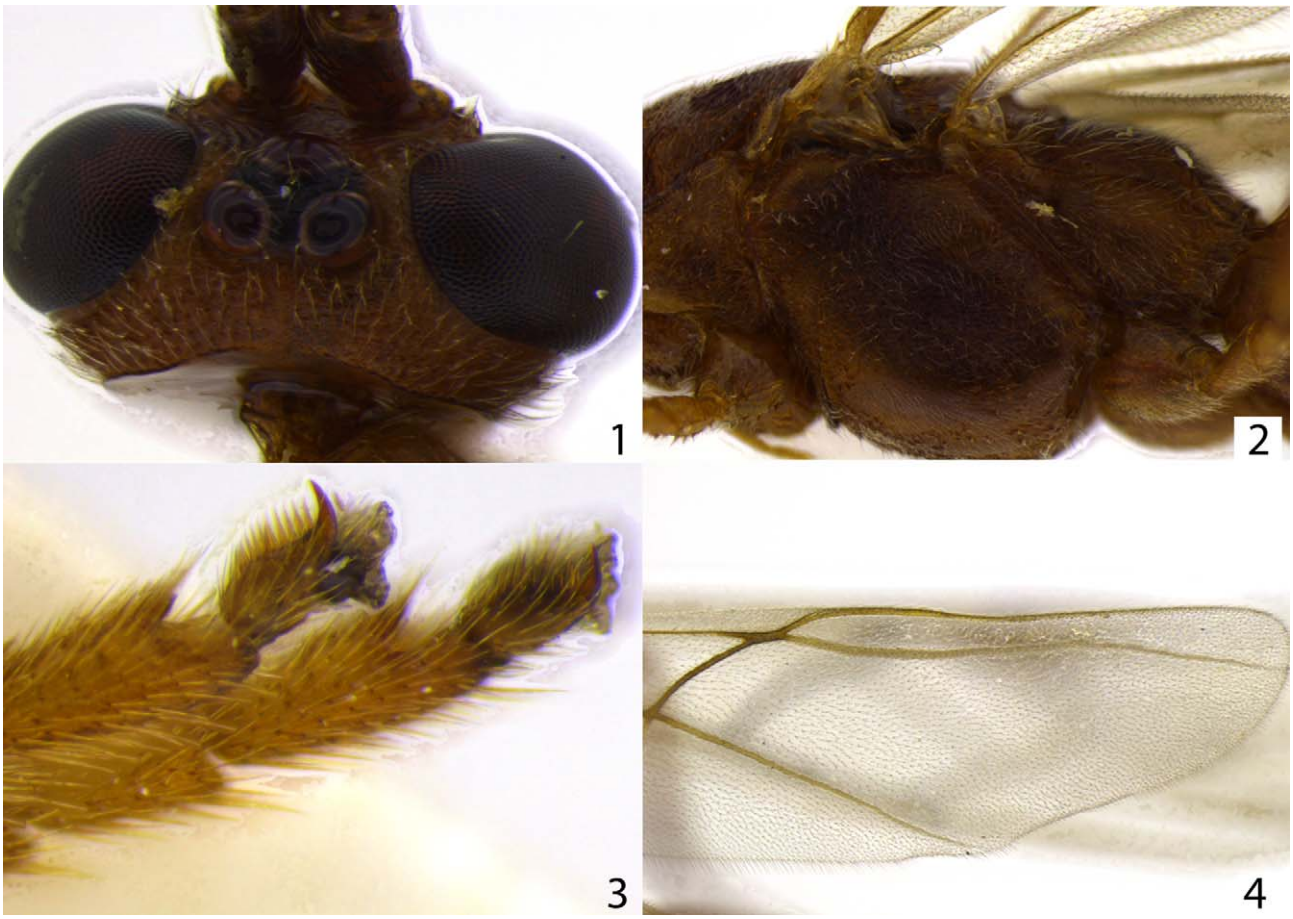
1. Head and mesosoma extensively marked with black or brown (Figs 5, 17, 19, 20), metasoma black or yellow (Figs 8, 22) . . . 2
– Body entirely orange or honey yellow (Figs 2, 9, 11, 14, 15) . . . 3
2(1). Fore wing pterostigma bi-colored, brown with yellow at base and occasionally at apex (Fig. 7); metasoma black, occasionally with yellow spots medially (Fig. 8) .. . . . ***lymantriae*** (Watanabe)
– Fore wing pterostigma uni-colored brown or yellow (Fig. 21); metasoma yellow to light brown (Fig. 22) . . . . . ***xanthoclypeus*** sp.nov.
3(1). Tarsal claws distinctly and completely pectinate (Fig. 12); small species about 5 mm long with 43–45 flagellomeres (Fig. 11); southern species known only from Florida . . . . . ***martini*** sp.nov.
– Tarsal claws not entirely pectinate, with several long setae pre-apically but with a distinct gap between apical tarsal claw and pre-apical setae (Fig. 3); larger species about 6–8 mm long with 48–55 flagellomeres (e.g. Fig. 15); northern species distributed from Maine to Maryland, and possibly in the Pacific northwest 4
4(3). Hind wing vein RS sinuate beyond middle (Fig. 4) . . . . . ***indiscretus*** (Reardon)
– Hind wing vein RS sinuate at or before middle (Fig. 16) . . . . . ***pallidator*** (Thunberg)

Aleiodes indiscretus (Reardon, 1970)
(Figs 1–4, 23)

Rogas indiscretus Reardon, 1970, Proc. Entomol. Soc. Wash. 72: 473.

Diagnosis.—Body mostly honey yellow except ocellar triangle black (Fig. 1), dorsum of mesosoma and metasoma marked with light brown, antenna of male brown, wings hyaline, veins brown, pterostigma light brown to yellow; body length 6.0–8.0 mm; malar space slightly less than basal width of mandible and about 1/5 eye height; oral opening small and circular, diameter equal to basal width of mandible and about 1/2 face height; antenna with 48 flagellomeres; ocelli very large, ocell-ocular distance about 1/3 diameter of lateral ocellus; face and frons rugulose coriaceous, vertex and temple coriaceous; pronotum rugulose; mesonotum and scutellum coriaceous; mesopleuron coriaceous, subalar sulcus rugose, sternaulus rugulose (Fig. 2); propodeum rugulose coriaceous dorsally, coriaceous laterally, median carina complete; first, second and basal 3/4 of third metasomal terga rugose costate, median carina complete on first and second and, sometimes weak or absent on third tergum; fore wing with vein 1cu-a beyond 1M by distance about twice length of 1cu-a; hind wing with vein RS arched slightly beyond middle, marginal cell narrowest beyond middle (Fig. 4); tarsal claws not pectinate but with 6 thin spines at base (Fig. 3).

Distribution.—This species is native to India (Punjab, Kulu). It was introduced to the United States and released at study sites in Connecticut and Massachusetts during 1968. Recovery attempts during 1969 were unsuccessful (Reardon, 1970). More recently, specimens were collected from Maryland indicating that the species has apparently been established.



FIGURES 1–4. *Aleiodes indiscretus* (Reardon). Figure 1. Head and ocelli, dorsal view. Figure 2. Mesosoma, lateral view. Figure 3. Hind tarsus and claws. Figure 4. Hind wing venation showing sinuate RS vein.

Biology.—In India, *Aleiodes indiscretus* is a parasitoid of *Lymantria obfuscata* Walker, a relative of the gypsy moth. It was laboratory-cultured by Reardon (1970) on *Lymantria dispar* (L.), the gypsy moth, and released into

the eastern United States against that pest. Specimens were recently reared from *Dasychira* species in Maryland. Further biological observations were provided by Reardon *et al.* (1973).

Comments.—This exotic species now appears to be established in the eastern states from Massachusetts southwards to Maryland. It is similar to *A. pallidator* but *A. indiscretus* differs from *A. pallidator* by having the temples more strongly converging behind the eyes (Fig. 1), by having more coarse sculpture on the mesopleuron (Fig. 2), propodeum, and first tergum, and by the body color being somewhat darker and more reddish brown (Figs 1, 2). *Aleiodes indiscretus* reproduces sexually, while *A. pallidator* often reproduces parthenogenetically. Caterpillar mummies of *Dasychira* induced by this species, and by *A. pallidator*, are virtually identical. The hind wing RS vein of *A. indiscretus* is sinuate beyond the middle of the vein (Fig. 4), not before and near the middle as in *A. pallidator* (Fig. 16).

FIGURES 5–8. *Aleiodes lymantriae* (Watanabe). Figure 5. Head and clypeus, anterior view. Figure 6. Head and ocelli, dorsal view. Figure 7. Pterostigma and fore wing venation. Figure 8. Metasoma, dorsal view.

Aleiodes lymantriae (Wantanabe, 1937)
(Figs 5–8, 24)

Rhogas lymantriae Wantanabe, 1937, J. Fac. Agric. Hokkaido Imper. Univ. Sapporo 42: 57–58.

Diagnosis.—Body mostly dark brown to black, except malar space (Fig. 5), mandible, palpi, tegula, wing base, metasomal terga 1–2 apico-medially (Fig. 8), and metasomal venter on basal 1/2 yellow, tegula bright yellow, pterostigma with small yellow spots basally and apically (Fig. 7), fore and middle legs, hind leg from coxa to femur yellow, hind tibia and tarsus brown, middle tibia and tarsus of male pale brown; body length 6–8 mm; 55

antennomeres; ocelli large (Fig. 6), diameter of lateral ocellus about three times ocell-ocular distance, lateral ocellus approaching eye margin; malar space shorter than basal width of mandible; face, frons, vertex and temple coriaceous; oral opening small, diameter slightly less than basal width of mandible; pronotum rugose; mesonotum and scutellum coriaceous; mesopleuron rugose coriaceous and dull, subalar sulcus rugose, sternaulus absent; propodeum rugulose coriaceous, median carina complete; first and second metasomal terga rugulose coriaceous, median carina complete, third tergum rugulose coriaceous on basal half, median carina absent; fore wing with vein 1cu-a beyond 1M by distance about twice length of 1cu-a; hind wing with vein RS arched medially, marginal cell narrowest in middle; tarsal claws with only weak pre-apical spines.

Distribution.—Japan (Hokkaido, Honshu). Imported into the eastern United States from Japan as a biological control agent of the gypsy moth but not known to be established.

Biology.—Recorded as a parasitoid of the gypsy moth, *Lymantria dispar* (Watanabe, 1937). The species overwinters in *Orgyia recens* (Hubner) and will develop in *O. thyellina* Butler in the laboratory (Marsh, 1979).

Comments.—This species is included in this revision because of the possibility that it has become established in the United States, although it has not yet been recovered. This species can be distinguished from *A. indiscretus*, another gypsy moth parasitoid, by its much darker coloration, with the body being mostly dark brown to black, and by its exceptionally large ocelli (Fig. 6).

Aleiodes martini Shaw and Marsh, sp.nov.

(Figs 9–12)

Female.—**Body color**: entirely yellow including legs and antennae, propodeum and first metasomal tergum occasionally marked with light brown (Figs 9, 11); wings hyaline,veins brown, stigma and veins C+Sc+R and 1-R1 yellow. **Body length**, 5.0 mm; fore wing length, 5.0 mm. **Head**: eyes and ocelli large (Fig. 10), covering most of head; 45–47 antennomeres, flagellomeres slightly longer than wide; malar space short, less than basal width of mandible and about 1/5 eye height; temple narrow, about 1/3 eye width; occipital carina not quite meeting hypostomal carina, absent on vertex behind ocelli; oral opening small and circular, diameter equal to basal width of mandible; ocelli large, nearly touching eye, ocellocular distance 1/3 diameter of lateral ocellus; face coriaceous, weakly costate below antennae, frons, vertex and temple coriaceous; maxillary palpus not swollen; mandibles small, tips not crossing when closed. **Mesosoma**: pronotum coriaceous, weakly procate dorsally; mesonotum and scutellum coriaceous, notauli shallow and finely scrobiculate; mesopleuron coriaceous, subalar sulcus rugose, sternaulus absent; propodeum rugose-coriaceous dorsally, coriaceous laterally, median carina complete. **Legs**: tarsal claws entirely pectinate with 4–6 long spines on inner edge (Fig. 12) ; hind coxa coriaceous dorsally; inner spur at apex of hind tibia less than 1/2 length of hind basitarsus. **Wings**: fore wing with vein r 1/2 length of 3RSa and about 2/3 length of m-cu, vein 1cu-a beyond 1M by distance slightly greater than 1cu-a, vein 1CUa 1/3 length of 1CUb; hind wing with marginal cell slightly but distinctly narrower in middle and slightly widening at apex, vein RS weakly sinuate, vein r-m nearly as long as 1M, vein M+CU longer than 1M; vein m-cu short and weak but distinct. **Metasoma**: first tergum slightly wider at apex than long, strgate coriaceous, median carina complete; second tergum strigate coriaceous, median carina complete, third tergum strigate coriaceous on basal half, coriaceous on apical half, median carina absent on apical half; remainder of terga weakly coriaceous; ovipositor short, less than 1/2 length of hind basitarsus.

Male.—Unknown.

Holotype.—Female: FLORIDA, Oneco, March 22, 1955, John C. Martin. Deposited in CNC.

Paratypes.—FLORIDA: 2 females, same data as holotype; 1 female, Highlands Co., Archibold Biol. Sta., October 9, 1987, D. Wahl; 1 male, Gainesville, May 1–4, 1986, John LaSalle. Deposited in USNM, UWIM, AEI.

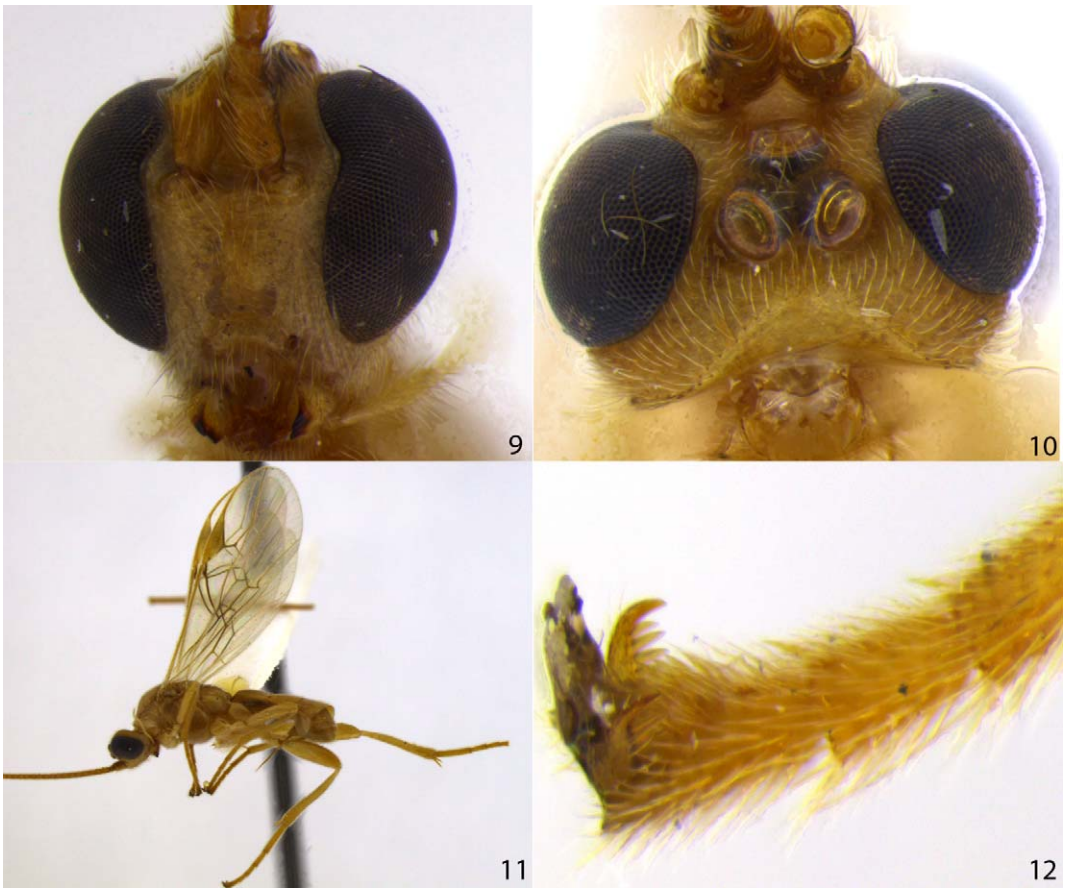
Distribution.—Known only from southwestern Florida.

Biology.—Unknown.

Comments.—Because of its small body size and light yellow color, this *A. martini* may appear similar to some species in the *gastritor* species-group, which are more commonly collected (see Shaw 2006). But *A. martini* can be distinguished from species of the *gastritor* group by its strongly pectinate tarsal claws (Fig. 12) and shorter malar space (Fig. 9). It can be distinguished from other light-colored species in the *pallidator* species-group by its small

body size (5 mm), completely and strongly pectinate tarsal claws, shorter antennae with 43–45 flagellomeres, and southern distribution (known only from Florida).

Etymology.—This species is named for the collector of most of the type-series, the late John C. Martin.



FIGURES 9–12. *Aleiodes martini* Shaw & Marsh, sp. nov. Figure 9. Head and face, anterior view. Figure 10. Head and ocelli, dorsal view. Figure 11. Habitus, lateral view. Figure 12. Hind tarsus and claws.

Aleiodes pallidator (Thunberg, 1822)
(Figs 13–16, 25–27)

Ichneumon pallidator Thunberg, 1822, Mem. Acad. Sci. St. Petersburg 8: 259.
Aleiodes unicolor Wesmael, 1838, Nouv. Mem. Acad. Brux. 11: 111. Synonymized by Roman, 1912.

Diagnosis.—Body mostly honey yellow (Figs 14, 15) except ocellar triangle brown to black (Fig. 13), antenna of male brown, wings hyaline, veins brown, pterostigma and C+Sc+R light brown to yellow; body length 6.0–8.0 mm; malar space equal to basal width of mandible and about 1/3 eye height; oral opening small and circular, diameter equal to basal width of mandible and about 1/2 face height; antenna with 51–55 flagellomeres; ocelli very large, ocell-ocular distance about 1/3 diameter of lateral ocellus (Fig. 13); face weakly rugulose, frons, vertex and temple coriaceous; pronotum coriaceous, rugulose medially; mesonotum and scutellum coriaceous; mesopleuron coriaceous, subalar sulcus rugose, sternaulus rugulose; propodeum rugulose coriaceous dorsally, coriaceous laterally, median carina complete; first, second and basal 1/2 of third metasomal terga rugose costate, median carina complete on first and second and, sometimes weak or absent on third tergum; fore wing with vein 1cu-a beyond 1M by distance slightly greater than length of 1cu-a; hind wing with vein RS arched slightly beyond middle, marginal cell narrowest beyond middle (Fig. 16); tarsal claws not entirely pectinate but with with 5–6 thin spines at base.

FIGURES 13–16. *Aleiodes pallidator* (Thunberg). Figure 13. Head and ocelli, dorsal view. Figure 14. Mesosoma, lateral view. Figure 15. Habitus, lateral view. Figure 16. Hind wing venation showing sinuate RS vein.

Distribution.—This species is native to Europe, where it is reported to be a monophagous parasitoid of the satin moth. During the 1930s it was introduced and released in the northeastern United States (Maine, Massachusetts, New Hampshire, Rhode Island, and Connecticut) for biological control of the satin moth, and also released in the Pacific northwest (Washington state). More recently it has been reported from Maryland (Barbosa *et al.* 2001).

Biology.—In the eastern United States, *A. pallidator* has been reared from the satin moth, *Leucoma salicis* (L.). In Maryland, possibly other Lymantriidae including *Orgyia definita* Packard, the white-marked tussock moth, *Orgyia leucostigma* (J.E. Smith), and *Dasychira* species are hosts (S. Shaw 2006). Prior to its release into the United States, the biology of this species was studied in great detail. There is one generation per year, with the parasitoid overwintering as a larva inside overwintering caterpillars. Dowden (1938) studied this species (as *Rogas unicolor*) and reported that it is a monophagous feeder on caterpillars of *Leucoma salicis*. He also noted that that in Europe, as well as the populations released into the United States, reproduction by this species is parthenogenetic, with females producing females without males. More recent studies by Mark Shaw confirm that in Europe the species is a strict monophage, reproducing parthenogenetically (M. Shaw 1983, 1994, 2002). Material from Maryland poses an interesting puzzle, as it includes both males and females, and has been reared from other lymantriid hosts including *Orgyia definita* Packard, the white-marked tussock moth, *Orgyia leucostigma* (J.E. Smith), and *Dasychira* species. It is not yet clear if this is a sexually reproducing population of *A. pallidator* or if this population is a previously unrecognized sibling species.

Comments.—This is one of the oldest known species in the genus, having been assigned to *Aleiodes* by Wesmael (1838). It is similar to *A. indiscretus*, a parasitoid of the gypsy moth. However, *A. pallidator* is lighter in color, and has less dense sculpture, especially notable on the side of the mesopleuron where there is a smooth shining area (Fig. 14). By comparison, *A. indiscretus* is more reddish brown, and has coarser sculpture on the mesopleuron. The hind wing RS vein of *A. pallidator* is sinuate before or near the middle of the vein (Fig. 16), not distinctly beyond the middle as in *A. indiscretus* (Fig. 4).

FIGURES 17–22. *Aleiodes xanthoclypeus* Shaw & Marsh, sp. nov. Figure 17. Head and clypeus, anterior view. Figure 18. Head and ocelli, dorsal view. Figure 19. Habitus, lateral view. Figure 20. Head and mesosoma, lateral view. Figure 21. Pterostigma and fore wing venation.Figure 22.Metasoma, dorsal view.

***Aleiodes xanthoclypeus* Shaw and Marsh, sp.nov.**
(Figs 17–22, 28)

Female.—**Body color**: bicolored (Figs 19, 20, 22), head including antenna black, clypeus and mouthparts yellow (Fig. 17), scape and margins around eyes occasionally light brown; mesosoma black, pronotum, scutellum and propodeum occasionally brown; metasoma (Fig. 22) and legs yellow to light brown; wings hyaline, veins including pterostigma brown (Fig. 21), tegula yellow. **Body length**, 7.0–8.0 mm; fore wing length, 6.0–7.0 mm. **Head**: eyes and ocelli large; 54–55 antennomeres, all flagellomeres longer than wide, first and second equal in length; malar space short, equal to basal width of mandible and about 1/4 eye height; temple narrow, about 1/3 eye width; occipital carina reaching hypostomal carina; oral space small and circular, width equal to malar space and about 1/2 face height; clypeus swollen; ocelli large (Fig. 18), ocell-ocular distance less than 1/2 diameter of lateral ocellus; face, frons and vertex rugose coriaceous, temple coriaceous; occiput weakly coriaceous and shining;

maxillary palpus not swollen; mandibles small, tips not crossing when closed. **Mesosoma**: pronotum rugose; mesonotum and scutellum coriaceous, notauli weakly scrobiculate, meeting in triangular rugose area before scutellum; mesopleuron coriaceous, smooth above episternal scrobe, subalar sulcus rugose, sternaulus represented by wide, shallow, weakly impressed rugose area; propodeum rugulose coriaceous dorsally, coriaceous laterally, median carina complete. **Metasoma**: First tergum rugose striate, length longer than apical width, median carina complete; second tergum rugulo-striate, median carina complete; third tergum rugulo striate on basal 1/2, coriaceous on apical 1/2, median carina distinct on basal 4/5; remainder of terga coriaceous; ovipositor equal to 1/2 length of hind basitarsus. **Legs**: tarsal claws not completely pectinate but with several long spines on basal 1/2; hind coxa weakly coriaceous dorsally. **Wings**: fore wing with vein r 1/2 length of 3RSa and about 2/3 length of m-cu, vein 1cu-a beyond 1M by distance slightly greater than length of 1cu-a. vein 1CUa about 1/3 length of 1CUb; hind wing with vein RS slightly arched medially, marginal cell narrowest in middle, vein r-m shorter than 1M, vein M+CU longer than 1M, vein m-cu represented by infuscated short line.

FIGURES 23–28. Mummified host caterpillar remains. Figure 23. *Dasychira* sp. parasitized by *A. indiscretus.* Figure 24. *Lymantria dispar* (gypsy moth caterpillar) parasitized by *A. lymantriae*. Figure 25. *Dasychira* sp. parasitized by *A. pallidator.* Figure 26. *Leucoma salicis* (satin moth caterpillar) parasitized by *A. pallidator.* Figure 27. *Orgyia leucostigma* parasitized by *A. pallidator.* Figure 28. *Olene grisefacta* parasitized by *A. xanthoclypeus.*

Male.—Essentially as in female.

Holotype.—Female: SASKATCHEWAN, Henribourg, Weyerhauser Seeds, June 19, 1989, *Dasychira plagiata* on w. spruce. Deposited in CNC.

Paratypes.—BRITISH COLUMBIA: 1 female, Boston Bar, July 29, 1950, ex. *Olene grisefacta*; 1 female, Davie Lake, July 29, 1950, *Olene* sp.; 1 male, Radium Hot Springs, July 12, 1948, *Olene* sp.; 1 female, Invermere, August 27, 1948, *Olene* sp. MANITOBA: 2 males, Sipwisk Lake, July 12, 1963, *Paragia plagiata*; 1 female, The Pas., July 14, 1956. WISCONSIN: 2 females, 1 male, Douglas Co., Gordon Nursery, August 25, 1948, July 13-August 25, 1951, R. D. Shenefelt; 1 male, Sawyer Co., Hayward Nursery, July 14, 1951, R. D. Shenefelt. Deposited in USNM, RMSEL, CNC, BMNH, AEI.

Distribution.—Occurs throughout Canada and into Wisconsin.

Biology.—Specimens have been reared from the lymantrids *Dasychira plagiata* (Walker), *Olene* sp. and *O. grisefacta* Dyar.

Comments.—This species is similar to *A. indiscretus* but is distinguished by its weakly pectinate claws, with spines restricted to the basal ½ of the claw, and by its distinctly bi-colored body. The bright yellow clypeus contrasting with the dark face (Fig. 17) is distinctive of *A. xanthoclypeus*.

Etymology.—The specific name is from the Greek *xanthos* meaning yellow in reference to the yellow clypeus.

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