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**Notes on *Chrysomelobia labidomerae*
(Acari: Heterostigmata: Podapolipidae), Parasites of
Labidomera clivicollis (Coleoptera: Chrysomelidae)
in Michigan and Wisconsin**

Robert W. Husband¹ and Andrew H. Williams²

Abstract

Chrysomelobia labidomerae Eickwort, ectoparasitic mite of chrysomelid beetles, is reported from 11 Wisconsin counties, from 16 of 82 adult *Labidomera clivicollis* (Kirby) beetles wild-caught in Wisconsin, and from 27 of 141 presumably wild-caught *L. clivicollis* beetles from 13 Michigan counties. Wisconsin beetles harboring *C. labidomerae* were found in dry to wet-mesic, open habitats. A distribution map and comments are presented.

Mites in the family Podapolipidae are all haemolymph feeding parasites of insects, including Blattodea, Coleoptera, Hemiptera, Hymenoptera and Orthoptera (Kurosa and Husband 2013). These mites parasitize the subelytral space, trachea, reproductive tract and any surface area which may be penetrated by stylets with or without the aid of digestive enzymes for dissolving sclerotized tissue (Husband et al. 2008). Regenfuss (1968) first described the genus *Chrysomelobia* and species *C. mahunkai* based on one adult female on the beetle now known as *Chrysolina graminis* (Linnaeus) (Daccordi 1982) collected in Hungary. It has since been collected on a second chrysomelid beetle, *Phytodecta* sp., in Germany by the first author.

Chrysomelobia labidomerae Eickwort was discovered under the elytra of *Labidomera clivicollis* (Kirby) and described as only the second mite in this genus and the first from the Nearctic by Eickwort (1975), in which paper the mite's distribution data of Connecticut, Illinois, Indiana, Iowa, Michigan (Cheboygan Co.), New York, Ohio, Texas and Wisconsin (Rock Co.) were presented. This beetle is more widely distributed in eastern North America and is an obligate feeder on milkweeds, Asclepiadaceae (Clark et al. 2004, Riley et al. 2003). *Chrysomelobia labidomerae* was later found parasitizing four other species of chrysomelid beetles in the closely related genus *Leptinotarsa* in Mexico, including *L. decemlineata* (Say) (Drummond et al. 1984), now a very widespread pest of potatoes (Clark et al. 2004). As yet, five species of chrysomelid beetles are reported to host *C. labidomerae* (Houck 1992). Abbot and Dill (2001) reported *C. labidomerae* from *L. clivicollis* beetles collected off *Asclepias incarnata* Linnaeus in southern Ontario, at Queens University Biological Station near Elgin, at a latitude similar to central Wisconsin and central Michigan. The first author has collected *C. labidomerae* from *L. clivicollis* beetles in southern Texas, at Lyford. The reported limits of this mite's distribution to the northwest are Cheboygan Co., Michigan, and Rock Co., Wisconsin, (Eickwort 1975) (see Fig. 1).

Baker and Eickwort (1975) report that these mites do not parasitize eggs or larvae of *L. clivicollis*, that dispersal is accomplished only by adult females

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transferring between adult beetles, and that the incidence of these mites on 56 museum specimens of presumably wild-caught *L. clivicollis* from the vicinity of Ithaca, New York, was 14.3%. Abbot and Dill (2001) reported that, in mid-summer, over 90% of 118 wild-caught males and females in southern Ontario had these mites.

Serendipitous collection of mites in the course of broader research on this beetle in Wisconsin by the second author provided us with new information about the range of habitats in which this mite occurs, the plants on which the beetles harboring mites were collected and new distribution data. These last were supplemented with new county data from museum specimens of Michigan beetles inspected by the first author.

Materials and Methods

Over the course of ongoing research into the milkweed specific fauna of Wisconsin, the second author collected many eggs, larvae and adults of *L. clivicollis* to voucher various aspects of the beetle's life history and distribution. Eggs and larvae were reared. When partly grown, these larvae were each isolated and provided with sterile soil into which they burrowed to pupate. Adult beetles, either caught in the wild or reared in the lab, were quickly put into vials of 80% ethanol. These were later checked for mites by the first author. Some



Figure 1. In the original description of *Chrysolobus labidomerae* Eickwort (Podapolipidae), a mite parasitizing *Labidomera clivicollis* Kirby (Chrysolobidae), Eickwort (1975) listed Cheboygan Co., Michigan, and Rock Co., Wisconsin, as rough northwestern limits of the mite's broad distribution across much of the eastern United States. These counties are cross-hatched. The shaded counties — Cheboygan, Dickenson, Ingham, Ionia, Kalamazoo, Lenawee, Livingston, Midland, Oakland, Oceana, Ottawa, Washtenaw and Wayne in Michigan, and Adams, Buffalo, Crawford, Grant, Kewaunee, LaCrosse, Manitowoc, Sheboygan, Vernon and Walworth in Wisconsin — represent new collection data. These data show counties in which these mites have been found, not their actual distribution.

specimens were retained by the first author, others were later deposited into the Insect Research Collection of the Entomology Department at University of Wisconsin — Madison. Prompted by this research into the distribution of the mite in Wisconsin, the first author studied pinned specimens of *L. clivicollis* housed in the University of Michigan Museum of Zoology to generate new distribution data for the mite in Michigan. Plant nomenclature follows Gleason and Cronquist (1991).

Results

New records of *C. labidomerae* for Wisconsin are: **Adams Co.**, T15N R6E S14, sandy prairie, 10 August 2000, on *Asclepias syriaca* Linnaeus, #7002.2, A. H. Williams; **Buffalo Co.**, T20N R12W S10, open roadside, 24 July 2001, on *A. syriaca*, #7631.2, R. A. Christoffel; **Crawford Co.**, T6N R6W S11, highway right-of-way, 05 July 2000, on *Asclepias verticillata* Linnaeus, #6770.2, A. H. Williams; **Grant Co.**, T8N R3W S24, dry sandy prairie, 20 July 2001, on *Asclepias viridiflora* Rafinesque, #7589.2, A. H. Williams; **Kewaunee Co.**, T23N R23E S24, gravelly south-facing roadside bank, 10 August 2001, on *A. verticillata*, #7715.2, A. H. Williams; **LaCrosse Co.**, T16N R7W S32, Hixon Forest Nature Center, 30 June 2001, on *A. syriaca*, #7486.2, A. H. Williams; **Manitowoc Co.**, T18N R21E S10, gravelly roadside bank, 11 August 2001, on *A. verticillata*, #7740.2, A. H. Williams, T20N R22E S34, moist roadside, 11 August 2001, on *Asclepias incarnata*, #7738.2, A. H. Williams; **Cheboygan Co.**, T15N R20E S24, open roadside, 06 September 2000, on *A. verticillata*, #7189.2, A. H. Williams; **Vernon Co.**, T11N R7W S15, open roadside, 16 August 2000, on *A. syriaca*, #7067.2, A. H. Williams; **Walworth Co.**, T4N R16E S5, Young Prairie State Natural Area #132, a wet-mesic prairie, 30 June 2000, on *A. incarnata*, #6741.2, A. H. Williams.

New records of *C. labidomerae* for Michigan are: **Cheboygan Co.**, July 1964, collector unknown; **Dickenson Co.**, Floodwood, 26 July 1915, A. W. Andrews; **Ingham Co.**, date and collector unknown; **Ionia Co.**, 24 July 1941, R. R. Dreisbach; **Kalamazoo Co.**, Fort Custer Recreation Area, 30 July 1991, L. Williams; **Lenawee Co.**, southwest Adrian, 08 September 1980, R. W. Husband; **Livingston Co.**, E. S. George Reserve, 14 June 1955, D. C. L. Gosling, 07 June 1936 and 04 July 1937, S. Moore, June 1934, H. K. Wallace; **Midland Co.**, 8 miles west of Midland, 14 July 1935, A. Olsen and L. K. Gloyd, 14 July 1935, L. K. Gloyd; **Oakland Co.**, Bloomfield, 24 July 1932, S. Moore; **Oceana Co.**, 5 miles north of Hart, 29 July 1941, I. J. Cantrall; **Ottawa Co.**, Grand Haven, 30 August 1911, H. Ramstadt; **Washtenaw Co.**, 29 July 1933 and 02 August 1933, I. J. Cantrall, Ann Arbor, 01 August 1927, W. K. Bigelo, Pittsfield Ponds, 02 June 1919, T. H. Hubbell, Mud Lake, 12 June 1950, C. S. Rogers; **Wayne Co.**, 04 July 1909, collector unknown, Detroit, 15 June 1916, A. W. Andrews.

None of 86 adult *Labidomera clivicollis* reared in isolation in the lab in Wisconsin hosted *C. labidomerae*. Of 82 wild-caught beetles from Wisconsin, 18 (22%) hosted these mites. Of 141 adult beetles collected in Michigan and presumably caught in the wild, specimens in the collection of the University of Michigan Museum of Zoology, 27 (19%) hosted these mites.

Discussion

These data shift the known distribution of this mite in Wisconsin from Rock Co. (Beloit, 07 July 1962, R. Beardon) (Eickwort 1975), Beloit being central and right at the southern border, up through and all across the southern half of the state, a total of 11 counties (Fig. 1). These data shift the mite's known distribution in Michigan from Cheboygan Co. (21 June 1953, S. E. Neff) (Eickwort 1975), at the northern tip of the Lower Peninsula, to include at least part of the Upper Peninsula and to occur more generally around the southern half

of the Lower Peninsula, a total of 13 counties (Fig. 1). These data show where these mites have been found, not their actual distribution. *Labidomera clivicollis* occurs throughout Wisconsin, though it is much harder to find in northern Wisconsin than in southern Wisconsin.

These data include the first association of the mite with *L. clivicollis* collected from a spectrum of open habitats, from dry sandy prairie through dry south-facing roadside bank, open roadside, moist roadside to wet-mesic prairie, as well as beetles on four local food plants that are associated with this spectrum of habitats, typically growing in situations ranging from dry to moist: *Asclepias viridiflora*, *A. verticillata*, *A. syriaca* and *A. incarnata*.

That no mites were found on the 86 lab-reared adult beetles is not a surprising result. Baker and Eickwort (1975) stated that mites parasitize only adult beetles to which adult females disperse from other adult beetles. These 86 lab-reared adults never had contact with any other beetles from which mites might have been acquired. Our frequencies of occurrence of 22% on beetles wild-caught in Wisconsin and 19% on presumably wild-caught Michigan beetles are similar to the 14.3% reported on presumably wild-caught New York beetles (Baker and Eickwort 1975). In contrast, Abbot and Dill (2001) reported that, in midsummer, over 90% of 118 wild-caught males and females in southern Ontario had these mites.

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