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SCIENTIFIC NOTE

First Report of the Yellowmargined Leaf Beetle, *Microtheca ochroloma* Stål, 1860 (Coleoptera: Chrysomelidae), in Pennsylvania

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The yellowmargined leaf beetle, *Microtheca ochroloma* Stål, 1860 (Figs. 1–3), which is native to South America, was first intercepted in the USA in New Orleans, Louisiana in 1945. Shortly thereafter, established field populations were discovered around Mobile, Alabama in 1947 (Chamberlin and Tippins1948; Balsbaugh 1978). The species has since spread throughout the southeastern USA from Florida and North Carolina west through Texas and Oklahoma (Balusu *et al.* 2017) and recently was recorded in California (Gilbert *et al.* 2011) and Illinois (Marché 2013). Manrique *et al.* (2012) tested the temperature-dependent development and cold tolerance of *M. ochroloma* and predicted that its northern distribution could extend into Kansas, Illinois, Kentucky, and Virginia.

Yellowmargined leaf beetles are a serious pest of cruciferous crops. They are strongly attracted and cause significant damage to turnips (*Brassica rapa* L. var. *rapa*, Brassicaceae) and napa cabbage (*B. rapa* var. *pekinensis*), although they are recorded from a number of other Brassicaceae, including varieties of *B. oleracea* L. and *B. juncea* (L.), arugula (*Eruca sativa* Mill.) and radish (*Raphanus sativus* L.) (Balusu and Fadamiro 2011; Balusu *et al.* 2017). Additionally, they can be found on uncultivated and wild Brassicaceae, which may serve as alternative hosts to crop plants and sustain beetle populations between crop plantings (Marché 2013; Balusu *et al.* 2017). They are particularly damaging during the fall and winter growing months in Florida when natural enemies are less abundant (Ameen and Story 1997) and in organic operations, which have limited control options (Montemayor *et al.* 2016). Balusu *et al.* (2017) reviewed in detail the biology, ecology, and management of *M. ochroloma* in organic crucifer production.

Here, we report the first records of *M. ochroloma* in Pennsylvania from two localities. The first beetles were discovered at a farm in Philadelphia, Philadelphia County (40.0497°N, 75.2192°W) in mid-September 2017 on (in descending order of preference according to the client) *B. rapa* varieties, radish, and arugula. A second infestation was discovered in late October 2017 at an organic farm in Horsham, Montgomery County (40.175209°N, 75.165149°W), which is approximately 14.7 km distant from the first site. At the second site, dozens of individuals of all life stages were present. Larvae and adults caused significant damage to *B. rapa* varieties (Fig. 4), but they were not found on nearby kale or broccoli (*B. oleracea*).

Philadelphia and Horsham are at the northern limit for *M. ochroloma* predicted by Manrique *et al.* (2012), and our findings of the beetle are the most northern records of the species to date. Clients at both farms and a local extension educator were asked to search for *M. ochroloma* specimens during the spring of 2018 on both planted and wild, weedy crucifers, but none were found. However, despite their absence during the spring and summer, *M. ochroloma* larvae were found on 18 September 2018 at one of the farms. This suggests the population successfully overwintered and is likely established in Pennsylvania. It is unclear how climate change will affect the distribution of *M. ochroloma*. Warming temperatures may allow them to persist further north than current conditions allow, while more severe or erratic winter conditions and temperatures may limit northern expansion.

References Cited

Ameen, A. O., and R. N. Story. 1997. Feeding preferences of larval and adult *Microtheca ochroloma* (Coleoptera: Chrysomelidae) for crucifer foliage. Journal of Agricultural Entomology 14: 363–368.

Balsbaugh, E. U., Jr. 1978. A second species of *Microtheca* Stål (Coleoptera: Chrysomelidae) found in North America. The Coleopterists Bulletin 32(3): 219–222.

Balusu, R. R., and H. Y. Fadamiro. 2011. Host finding and acceptance preference of the yellowmargined

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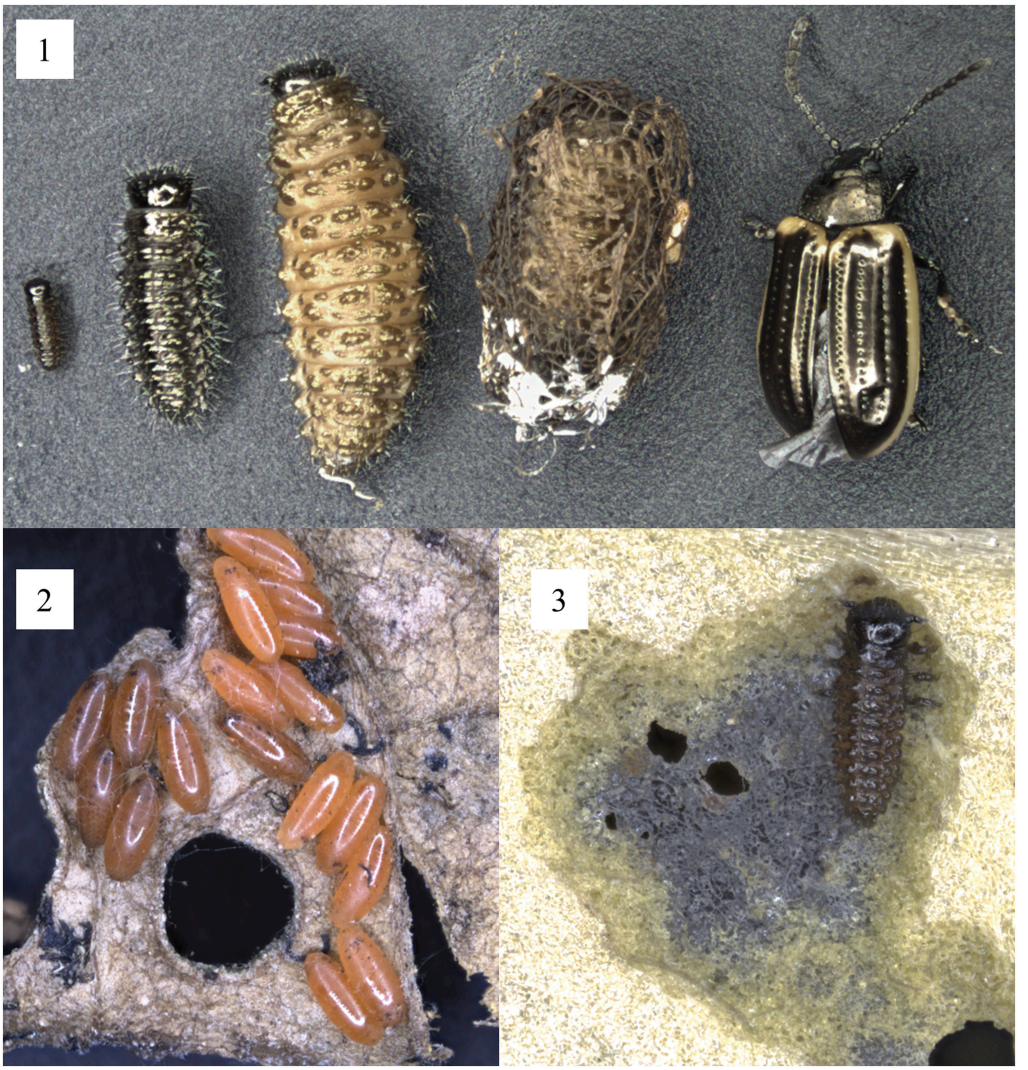

Figs. 1–3. *Microtheca ochroloma*. **1)** First, second, and fourth instars, pupal chamber, and adult; **2)** Eggs on an old napa cabbage leaf; **3)** First instar feeding on an old napa cabbage leaf.

leaf beetle, *Microtheca ochroloma* (Coleoptera: Chrysomelidae), on cruciferous crops. Environmental Entomology 40(6): 1471–1477.

Balusu, R. R., and H. Y. Fadamiro. 2013. Susceptibility of *Microtheca ochroloma* (Coleoptera: Chrysomelidae) to botanical and microbial insecticide formulations. Florida Entomologist 96: 914–921.

Balusu, R. R., E. M. Rhodes, O. E. Liburd, and H. Y. Fadamiro. 2015. Management of yellowmargined leaf beetle *Microtheca ochroloma* (Coleoptera: Chrysomelidae) using turnip as a trap crop. Journal of Economic Entomology 108: 2691–2701.

Balusu, R. R., E. M. Rhodes, A. Majumdar, R. D. Cave, O. E. Liburd, and H. Y. Fadamiro. 2017. Biology, ecology, and management of *Microtheca ochroloma* (Coleoptera: Chrysomelidae) in organic crucifer production. Journal of Integrated Pest Management 8(1): 1–10.

Chamberlin, F. S., and H. H. Tippins. 1948. *Microtheca ochroloma*, an introduced pest of crucifers, found in Alabama. Journal of Economic Entomology 41(6): 979–980.

Gilbert, A. J., J. Willems, and J. Sohal. 2011. *Microtheca ochroloma* Stål 1860, a newly introduced leaf beetle to California (Coleoptera: Chrysomelidae: Chrysomelinae). Pan-Pacific Entomologist 87(3): 201–202.

Manrique, V., R. Diaz, C. Montemayor, D. Serrano, and R. D. Cave. 2012. Temperature-dependent development and cold tolerance of *Microtheca*

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Fig. 4. Defoliation by the yellowmargined leaf beetle to Yokatta-Na, a type of Asian cabbage (*Brassaca rapa* ssp. *narinosa*). Photograph by Stephanie Jones, used with permission.

ochroloma (Coleoptera: Chrysomelidae), a pest of cruciferous crops in the southeastern United States. Annals of the Entomological Society of America 105(6): 859–864.

Marché, J. D., II. 2013. First record of *Microtheca ochroloma* Stål (Coleoptera: Chrysomelidae) from Illinois, USA. The Coleopterists Bulletin 67(4): 602–603.

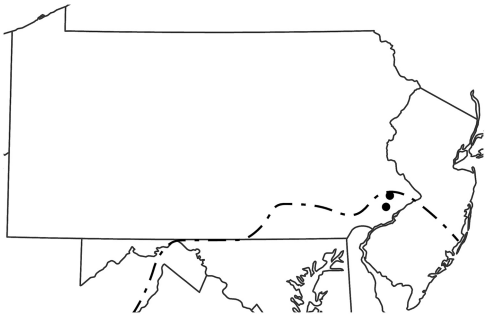

Fig. 5. *Microthecha ochroloma* collection localities in Pennsylvania (solid black circles). Isothermal line (dashed line) indicates lower limit of region where 90% of *M. ochroloma* populations are predicted to succumb to cold temperatures (LT_{90} = 0° C >38 days), adapted from Manrique *et al.* (2012).

Montemayor, C. O., and R. D. Cave. 2009. Prospects for biological control of the yellow-margined leaf beetle, *Microtheca ochroloma* Stål. Proceedings of the Florida State Horticultural Society 122: 250–252.

Montemayor, C. O., and R. D. Cave. 2011. Development time and predation rate of *Podisus maculiventris* (Hemiptera: Pentatomidae) feeding on *Microtheca ochroloma* (Coleoptera: Chrysomelidae). Environmental Entomology 40: 948–954.

Montemayor, C. O., and R. D. Cave. 2012. Evaluation of the predation capacity of *Podisus maculiventris* (Hemiptera: Pentatomidae) on *Microtheca ochroloma* (Coleoptera: Chrysomelidae) in field cages. Journal of Economic Entomology 105: 1719–1725.

Montemayor, C. O., P. B. Avery, and R. D. Cave. 2016. Infection and mortality of *Microtheca ochroloma* (Coleoptera: Chrysomelidae) by *Isaria fumosorosea* (Hypocreales: Cordycipitaceae) under laboratory conditions. Biocontrol Science and Technology 26(5): 605–616.

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