J. Acad. Entomol. Soc. 22: 24-27 (2025)

NOTE

First record of *Macrotylus sexguttatus* (Heteroptera: Miridae) in the Canadian Maritimes

Jeff C. Clements

Mirids (Hemiptera: Heteroptera: Miridae) are the largest and most species-rich family of true bugs (Heteroptera) on the planet. With >11,000 documented species worldwide, mirids are considered hyperdiverse and account for ≈25% of all heteropterans (Cassis and Schuh 2012; Oh et al. 2023). Given this hyperdiversity, mirid taxonomy remains unsettled, with new species uncovered often and taxonomic revisions being frequent (Raupach et al. 2014; Konstantinov and Namyatova 2019; Piemontese et al. 2020; Oh et al. 2023). The local diversity of mirids in many places around the world also remains poorly understood (e.g., Kobór 2021; Chordas and Tumlinson 2025). Notwithstanding, a recent inventory of Heteroptera in Central and Atlantic Canada, as well as adjacent U.S. states, reported 230 species of Miridae in the Canadian Maritimes (i.e., in at least one of three Maritime Provinces), with 40 of those (17%) being labelled as introduced (Roch 2024).

Macrotylus Fieber, 1858 is a genus of mirids belonging to the Cremnorrhinina tribe within the Phylinae. With 69 valid species, *Macrotylus* is the largest genus within the Phylinae (Kobór 2021). Aside from three species found exclusively in South Africa (Schuh 1974; Salas and Schuh 2018), *Macrotylus* are typically Holarctic, with >80% of species residing in Palearctic regions (Kobór 2021). Despite this diversity, the recent inventory by Roch (2024) suggested the presence of only a single *Macrotylus* species in Eastern Canada—*Macrotylus sexguttatus* (Provancher, 1887)—which has only been reported in Ontario and Québec in Canada, as well as Maine and New York in the U.S.A. (Roch 2024). This species is readily identifiable from other Miridae in the region by its distinctive black colouration and six highly-contrasted white markings at the rear of the elytra (Van Duzee 1916). Furthermore, *M. sexguttatus* is the only species of *Macrotylus* recorded in Canada (Roch 2024), and while another species, *Macrotylus amoenus* Reuter, is reported from New York, it has a distinctive bright yellow or green colour that is in stark contrast to the deep black colouration of *M. sexguttatus*.

On 06 July 2025, I observed a single adult *M. sexguttatus* (Figure 1) atop a leaf of a pre-flowering large-leafed aster, *Eurybia macrophylla* (L.) Cass, on the disturbed forest edge of my backyard in Clairville, New Brunswick, Canada (46.39719 °N, −65.07480 °W) (Figure 2). While an accurate size was not obtained, the individual was estimated to be ≈5 mm in length from head to the back of the wings and certainly <1 cm, which is typical of this species (Knight 1941). Previous documentations of *M. sexguttatus* have also reported the species feeding and mating on *E. macrophylla* (Drake 1922) and other Asteraceae (Knight 1941).

Images of the individual were uploaded to BugGuide (Clements 2025a) and iNaturalist (Clements 2025b). The identification was confirmed soon after on iNatruralist by Jean-François Roch (username *@jeanfrancoisroch*), a member of the Association des Entomologistes Amateurs du Québec and regional expert in the Heteroptera of Québec and adjacent provinces and states. Upon learning of the rarity of this species, I consulted numerous entomologists in the region (see Acknowledgements) to determine if any specimens of *M. sexguttatus* existed in any regional collections; no additional specimens were reported to me by those individuals. Coupled with the lack of Maritime records in the recent Roch (2024) inventory, it appears that this constitutes the first record of *M. sexguttatus* in the Maritimes.

M. sexguttatus is generally considered a rare species of Miridae. Alongside being the first record for the Canadian Maritimes, this observation is the first and only global record for this species on iNaturalist (iNaturalist 2025) and only the second record on BugGuide (BugGuide 2025). Despite its rarity, the presence of *M. sexguttatus* in New

Received September 2025. Accepted for publication October 2025. Published on the Acadian Entomological Society website at www.acadianes.ca/journal.php in Februrary 2026.

Jeff C. Clements: University of New Brunswick, 100 Tucker Park Road, Saint John, NB E2L 4L5, Canada

Corresponding author (email jefferycclements@gmail.com)

Figure 1. Images of the individual *Macrotylus sexguttatus* observed at Clairville, New Brunswick on 06 July 2025. Panels **a** and **b** show two separate images of the individual on different leaves of the same plant; panel **c** is a cropped version of panel **a**.

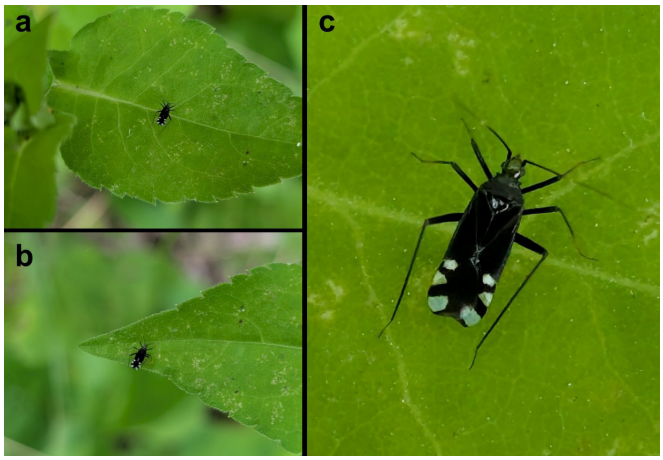
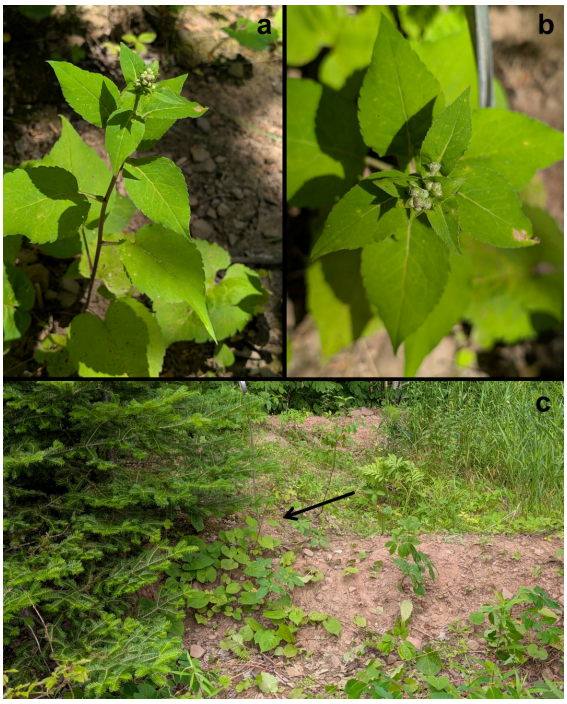


Figure 2. Side (**a**) and top (**b**) view images of the plant (large-leaved aster, *Eurybia macrophylla*), as well as the habitat (**c**) upon which the individual *Macrotylus sexguttatus* was observed. **Note**: images were taken on 12 July and 13 July 2025, respectively—six days after the *Macrotylus sexguttatus* individual was observed. The arrow in panel **c** denotes the plant.



Brunswick is not unexpected, as records of this species have existed for decades in regions directly adjacent to this Province. For example, the first record of this species in Québec was documented by Provancher (1887) and the only other record of this species on BugGuide is a 2015 observation from Maine, U.S.A. (Curtis 2015); the first record of this species in Ontario dates back to 1966 (Loan 1974, 1980). It is possible that this species has been in New Brunswick for some time and has gone undetected, most probably due to a combination of its small size (≈3 mm length; Knight 1941) and the lack of targeted surveys for this species (and mirid species in general; Kobór 2021). On the other hand, the species is visually conspicuous, and it is a bit surprising that it has not been recorded in any surveys. As such, the species may be numerically rare as well, as *M. sexguttatus* is documented to be parasitized at relatively high rates (≈25%) by braconid wasps of the genus *Peristenus* Foerster, 1862 (Loan 1974, 1980). Targeted interprovincial surveys for this species (and other mirids) could help elucidate its abundance and geographic distribution within the Maritimes. Given that this species appears to be often associated with Asteraceae (Drake 1922, Knight 1941), focusing efforts on asters may be most likely to yield further observations.

Ecological knowledge of mirids is generally restricted to the feeding ecology and host-plant associations of particular species, likely due to their economic impacts as pests (i.e., phytophagous mirids that consume crops) or biocontrol agents (i.e., predatory mirids) (Wheeler 2001; Cassis and Schuh 2012). *Macrotylus* mirids are generally considered phytophagous, with species being either mono- or oligophagous herbivores (Göllner-Scheiding 1972; Wagner 1974; Özgen et al. 2021). Notwithstanding, the biology and ecology of *Macrotylus*, including *M. sexguttatus*, has not been extensively studied. In a report on *Galeatus spinifrons* (Fallén, 1807) (Heteroptera: Tingidae) from New York, U.S.A. (Cranberry Lake region), Drake (1922) noted *M. sexguttatus* "feeding and breeding in considerable numbers" on large-leaved asters, *E. macrophylla*—the same species in which the individual presented herein was observed (although no obvious evidence of feeding or breeding was observed). Furthermore, Knight (1941) identified the wavy-leaf aster, *Symphyotrichum undulatum* (L.) G.L. Nesom, as a host plant of *M. sexguttatus*. However, *M. sexguttatus* collected in Ontario in June 1966 were reportedly breeding on Canada wild ginger, *Asarum canadense* L. (Loan 1974, 1980), which is not part of the Asteraceae. Consequently, the feeding ecology and host-plant associations of *M. sexguttatus* are largely unresolved and warrant investigation.

ACKNOWLEDGEMENTS

I want to thank Jean-François Roch for assistance and confirmation of species identification on iNaturalist. Thanks to many colleagues for advice and checking their collections for additional evidence of this species in the Maritimes (or lack thereof): Alana Pindar (Cape Breton University), David McCorquodale (Cape Breton University; retired), Randy Lauff (St. Francis Xavier University), Kirk Hillier (Acadia University), Chris Cutler and Paul Manning (Dalhousie University Agricultural Campus), Jeff Ogden (Nova Scotia Department of Natural Resources), Steven Heard (University of New Brunswick; retired), Reginald Webster (independent entomologist, Fredericton NB), Jessica Vickruck (Agriculture and Agri-Food Canada), Donald McAlpine (New Brunswick Museum), John Klymko (Atlantic Canada Conservation Data Centre), Denis Doucet (Fundy National Park), and Gaétan Moreau (Université de Moncton). Further thanks to Randy Lauff for constructive feedback on an earlier version of this manuscript, as well as two anonymous reviewers and the handling editor (Sara Edwards) for constructive comments which improved the manuscript.

REFERENCES

BugGuide. 2025. Species *Macrotylus sexguttatus*. BugGuide.net: Identification, images, & information for insects, spiders & their kin for the United States & Canada. Iowa State University [online]. Available from https://bugguide.net/node/view/1244188 [accessed 31 October 2025]

Cassis, G., and Schuh, R.T. 2012. Systematics, biodiversity, biogeography, and host associations of the Miridae (Insecta: Hemiptera: Heteroptera: Cimicomorpha). Annual Review of Entomology **57:** 377-404.

Chordas, S.W. III and Tumlinson, R. 2025. First records of 31 plant bug species (Hemiptera: Heteroptera: Miridae) from Arkansas, USA. Entomological News **132:** 140-147.

Clements, J. 2025a. *Macrotylus sexguttatus*. iNaturalist observation [online]. Available from https://inaturalist.ca/observations/295771014 [accessed on 31 October 2025]

Clements, J. 2025b. *Macrotylus sexguttatus*? -*Macrotylus sexguttatus*. BugGuide.net: Identification, images, & information for insects, spiders & their kin for the United States & Canada. Iowa State University [online]. Available from https://bugguide.net/node/view/2469708 [accessed on 31 October 2025]

Curtis, R. 2015. 9031639 mirid? - *Macrotylus sexguttatus*. BugGuide.net: Identification, Images, & Information for Insects, Spiders & Their Kin for the United States & Canada. Iowa State University [online]. Available from https://bugguide.net/node/view/1121468 [accessed on 31 October 2025]

Drake, C.J. 1922. Contribution toward the life history of *Galeatus peckhami* Ashmead. Technical Publication of the New York State College of Forestry at Syracuse University **22:** 105-110.

Göllner-Scheiding, U. 1972. Beiträg zur Heteropter.n-Fauna Brandenburgs. 2. Ubersicht über die Heteopteren von Brandenburg. Veröffentlichungen des Bizirksheimat Museum Potsdam **25:** 5-39.

iNaturalist. 2025. Observations of *Macrotylus sexguttatus* from North America [online]. Available from https://inaturalist.ca/taxa/1633072-Macrotylus-sexguttatus [accessed 31 October 2025]

Knight, H.H. 1941. The plant bugs, or Miridae, of Illinois. Illinois Natural History Survey Bulletin **22:** 1-234.

Kobór P. 2021. A review of the plant bug genus *Macrotylus* distributed in Hungary (Heteroptera: Miridae). Acta Phytopathologica et Entomologica Hungarica **56:** 187-200.

Konstantinov, F.V., and Namyatova, A.A. 2019. Taxonomic revisions and specimen databases in the internet age: Dealing with a species rich insect taxon. Entomological Review **99:** 340-361.

Loan, C.C. 1974. The North American species of *Leiophron* Nees, 1818 and *Peristenus* Foerster, 1862 (Hymenoptera: Braconidae, Euphorinae) including the description of 31 new species. Le Naturaliste Canadien **101:** 821-860.

Loan, C.C. 1980. Plant bug hosts (Heteroptera: Miridae) of some euphorine parasites (Hymenoptera: Braconidae) near Belleville, Ontario, Canada. Le Naturaliste Canadien **107:** 87-93.

Oh, M, Kim, S., and Lee, S. 2023. Revisiting the phylogeny of the family Miridae (Heteroptera: Cimicomorpha), with updated insights into its origin and life history evolution. Molecular Phylogenetics and Evolution **184:** 107796.

Özgen, İ, Dioli, P., Koç, İ, and Topdemir, A. 2021. Some Heteroptera (Hemiptera) species that are potential natural enemies of *Cimbex quadrimaculata* (Müller, 1766) (Hymenoptera: Cimbicidae). Journal of the Heteroptera of Turkey **3:** 151-156.

Piemontese, L., Giovannini, I., Guidetti, R., Pellegri, G., Dioli, P., Maistrelle, L., Rebecchi, L., and Cesari, M. 2020. The species identification problem in mirids (Hemiptera: Heteroptera) highlighted by DNA barcoding and species delimitation studies. The European Zoological Journal **87:** 310-324.

Provancher, L.A. 1887. Petite Faune Entomologique du Canada: Vol. 3—Les Hémiptères. Québec.

Raupach, M.J., Hendrich, L., Küchler, S.M., Deister, F., Morinière, J., and Gossner, M.M. 2014. Building-up of a DNA Barcode Library for true bugs (Insecta: Hemiptera: Heteroptera) of Germany reveals taxonomic uncertainties and surprises. PLoS One **9:** e106940.

Roch, J.F. 2024. Liste des punaises du Québec et des régions adjacentes (Hemiptera : Heteroptera). Document Faunique no. 27, version 3.1. Entomofaune du Québec, Saguenay.

Salas, R., and Schuh, R.T. 2018. *Macrotylus henryi*, a new species of Pelargonium-feeding Cremnorrhinina from South Africa (Hemiptera, Miridae, Phylinae, Cremnorrhinini). ZooKeys **796:** 267.

Schuh, R.T. 1974. The Orthotylinae and Phylinae (Hemiptera: Miridae) of South Africa with a phylogenetic analysis of the ant-mimetic tribes for the two subfamilies for the world. Entomologica Americana **47:** 1-332.

Van Duzee, E.P. 1916. Review of the Genus *Macrotylus.* Fieb. Pomona Journal of Entomology and Zoology **8:** 5-11.

Wagner, E. 1974. Über *Macrotylus* Fieber, 1858 (Hemiptera, Heteroptera). Memorie della Società Entomologica Italiana **48:** 300-310.

Wheeler, A.G. Jr. 2001. Biology of the plant bugs (Hemiptera: Miridae). Pests, predators, opportunists. Cornell University Press, Ithaca.