

The Great Lakes Entomologist

Volume 26

Number 3 - Fall 1993 *Number 3 - Fall 1993*

Article 7

October 1993

New Records of Leaf-Feeding for Adult *Diabrotica Barberi* (Coleoptera: Chrysomelidae)

Louis S. Hesler

USDA-ARS

Follow this and additional works at: <http://scholar.valpo.edu/tgle>



Part of the [Entomology Commons](#)

Recommended Citation

Hesler, Louis S. (1993) "New Records of Leaf-Feeding for Adult *Diabrotica Barberi* (Coleoptera: Chrysomelidae)," *The Great Lakes Entomologist*: Vol. 26 : No. 3 , Article 7.

Available at: <http://scholar.valpo.edu/tgle/vol26/iss3/7>

This Peer-Review Article is brought to you for free and open access by the Department of Biology at ValpoScholar. It has been accepted for inclusion in The Great Lakes Entomologist by an authorized administrator of ValpoScholar. For more information, please contact a ValpoScholar staff member at scholar@valpo.edu.

NEW RECORDS OF LEAF-FEEDING FOR ADULT *DIABROTICA BARBERI*
(COLEOPTERA: CHRYSOMELIDAE)Louis S. Hesler¹

ABSTRACT

The first records of leaf-feeding on *Iva xanthifolia* (marsh elder) and *Helianthus annuus* (common sunflower) by adult *Diabrotica barberi* are reported. During September 1992, beetles were observed feeding on leaves of these plants, despite the availability of alternate flowering hosts. Beetles confined to clip cages in the laboratory fed readily on leaves of *I. xanthifolia* and *H. annuus* but not on those of *Solidago missouriensis* (goldenrod).

Diabrotica barberi Smith & Lawrence (northern corn rootworm, Coleoptera: Chrysomelidae) develop as larvae principally on the roots of maize (*Zea mays*) (Branson & Krysan 1981). Upon emergence from the soil, adults feed on maize tassels, silks, and ear tips. Maize leaves are not preferred food of adult *D. barberi* (Ludwig & Hill 1975) and are less suitable to their fecundity and longevity (Lance & Fisher 1987). As the floral structures of maize dry and deteriorate, adult *D. barberi* become increasingly abundant on the flowers of weeds, prairie forbs, and crops other than maize (Forbes 1882, Cinereski & Chiang 1968, Krysan & Branson 1983, Ludwig & Hill 1975, Riley & Enns 1979, Fisher et al. 1984, Mullin et al. 1986). Adult *D. barberi* also feed on fungal spores (Forbes 1882, Ludwig & Hill 1975) and on apples, especially where the skin has been broken by other insects (Forbes 1882). The literature is devoid of any reference to adult *D. barberi* feeding on leaves of plants other than maize.

During September 1992, however, I observed leaf-feeding by adult *D. barberi* at several sites throughout Brookings County, South Dakota. First, individuals were frequently observed throughout the month feeding on leaves of *Iva xanthifolia* (marsh elder), a composite widely distributed throughout North America. Beetles were seen less frequently on the floral parts of *I. xanthifolia*, and they could be found on the leaves of individual plants after floral parts had dried. At three of four sites (1–2 km W of Aurora), plants were growing adjacent to or within fields of maize, and plants at the remaining site (1 km N of Brookings) were in a field of soybeans (*Glycine max*). Other host plants of adult *D. barberi* (besides maize) were present, though not abundant, near patches of *I. xanthifolia*. Several of these alternate hosts (e.g., *Cirsium* spp., *Helianthus annuus*, *Solidago missouriensis*) were flowering, and *D. barberi* were present on them.

In a second instance (23 Sept.), I observed seven *D. barberi* adults feeding on the leaves of a single *H. annuus* (common sunflower) plant growing adja-

¹USDA-ARS, Northern Grain Insects Research Laboratory, Rural Rt. 3, Brookings, SD 57006-9401. Current address: U.S. Army, AMEDD Center and School, Fort Sam Houston, TX 78234.

cent to a maize field (located immediately NE of Bushnell). Flower buds were present but had not yet opened on this plant. Several flowering aster plants (*Erigeron* sp., another host of adult *D. barberi*) were growing across a grassy access road, and only one beetle was observed on these flowers. Finally, I did not observe beetles feeding on the leaves of flowering *H. annuus* growing in nearby areas, although beetles were quite abundant on flower heads.

Field-collected beetles confined in clip cages (2.8 × 2.8 × 1.5-cm hinged, plastic cages with eight 3-mm diameter, mesh-covered holes) fed readily on leaves of *I. xanthifolia* (n = 14) or *H. annuus* (n = 3) in the laboratory (two beetles per cage per leaf). I estimated that beetles consumed up to 30 and 20%, respectively, of the *I. xanthifolia* and *H. annuus* leaf tissue present in clip cages during a 48-h period. By comparison, beetles fed only slightly on maize leaves (n = 2 and previous observations) and not at all on *S. missouriensis* (goldenrod) leaves (n = 5). Voucher specimens of field-collected *D. barberi* have been deposited at the Northern Grain Insects Research Laboratory, Brookings, SD.

These observations represent the first records of leaf-feeding on *I. xanthifolia* and *H. annuus* by adult *D. barberi*. However, Lance & Fisher (1987) have noted that, although adult *D. barberi* can be observed to feed on numerous plant species, the relative quality of different food plants varies significantly in terms of beetle fecundity and longevity. Nevertheless, leaf-feeding by beetles on *I. xanthifolia* when other favored flowering hosts are available suggests that the foliage of this plant is a preferred food. Leaves of *H. annuus* appear to be much less preferred than flower heads, but apparently are preferable to aster flowers. Additional detailed studies comparing the quality of *I. xanthifolia* and *H. annuus* leaves with other plant tissues are needed for understanding the ecological implications of the host-utilization patterns of *D. barberi* (Lance & Fisher 1987).

ACKNOWLEDGMENTS

Leon J. Wrage, South Dakota State University, identified *H. annuus* and *S. missouriensis* plants. David A. Beck assisted in identifying *I. xanthifolia* plants. David A. Tolk helped collect beetles from the field and maintain them in the laboratory. Gerald R. Sutter, Robert W. Kieckhefer, and Horace R. Burke graciously reviewed drafts of this manuscript.

LITERATURE CITED

- Branson, T. F. and J. L. Krysan. 1981. Feeding and oviposition behavior and life cycle strategies of *Diabrotica*: an evolutionary view with implications for pest management. *Environ. Entomol.* 10:820-825.
- Cinereski, J. E. and H. C. Chiang. 1968. The pattern of movements of the northern corn rootworm inside and outside of corn fields. *J. Econ. Entomol.* 61:1531-1536.
- Fisher, J. R., T. F. Branson, and G. R. Sutter. 1984. Use of common squash cultivars, *Cucurbita* spp., for mass collection of corn rootworm beetles, *Diabrotica* spp. (Coleoptera: Chrysomelidae). *J. Kans. Entomol. Soc.* 57: 409-412.
- Forbes, S. A. 1882. The corn root-worm. Ill. *St. Ent. Annu. Rep.* 12:10-31.
- Krysan, J. L. and T. F. Branson. 1983. Biology, ecology, and distribution of *Diabrotica*, pp. 144-150. In: Gordon, D. T., J. K. Knoke, L. R. Nault, and R. M. Ritter [eds.], *Proc. intl. maize virus colloq. workshop*. Ohio Agricultural Research and Development Center, Wooster.
- Lance, D. R. and J. R. Fisher. 1987. Food quality of various plant tissues for adults of

- the northern corn rootworm (Coleoptera: Chrysomelidae). *J. Kansas Entomol. Soc.* 60:462-466.
- Ludwig, K. A. and R. E. Hill. 1975. Comparison of gut contents of adult western and northern corn rootworms in northeast Nebraska. *Environ. Entomol.* 4:435-438.
- Mullin, C. A., B. D. Siegfried, and W. R. Wenerick. 1986. Host plant effects on insecticide resistance in corn rootworms, no. 3E-28. *In: Pestcon 86, Abstracts sixth intl. congress pestic. chem. International Union of Pure and Applied Chemistry, Ottawa.*
- Riley, E. G. and W. R. Enns. 1979. An annotated checklist of Missouri leaf beetles. *Trans. Mo. Acad. Sci.* 18: 53-83.