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## *Urophora Quadrifasciata* (Diptera: Tephritidae), An Introduced Seedhead Fly New to Midwestern North America

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*UROPHORA QUADRIFASCIATA* [DIPTERA: TEPHRITIDAE], AN INTRODUCED SEEDHEAD FLY NEW TO MIDWESTERN NORTH AMERICAA. G. Wheeler, Jr.<sup>1</sup>

## ABSTRACT

The Old World tephritid *Urophora quadrifasciata*, a gall-inducing seed-head fly, was released in western and eastern North America for the biological control of knapweeds, *Centaurea* spp. (Asteraceae). Its establishment in the West (BC, CA, ID, MT, OR, WA) and in the East (CT, MA, MD, NH, NJ, NY, PA, RI, VA, VT, WV) has been previously reported. Collections from eastern Minnesota and western Michigan in 1995 are the first for the Northcentral region of North America.

The tephritid genus *Urophora* (about 100 spp.) includes eight species indigenous to the Nearctic Region and three Eurasian species that have been introduced to North America for the biological control of adventive knapweeds, *Centaurea* spp. (Asteraceae) (White and Korneyev 1989, Turner et al. 1994). *Urophora affinis* (Frauenfeld) and *U. quadrifasciata* (Meigen), the best known of the introduced gall-inducing, seedhead flies, were released in the early 1970s in British Columbia to help suppress infestations of diffuse knapweed (*C. diffusa*) and spotted knapweed (*C. biebersteinii* = *C. maculosa* of American authors). These weeds limit productivity in rangelands and displace native herbaceous vegetation. Larvae of both tephritids are able to coexist in heads of their host plants; despite negative interaction between these flies, their effects on knapweed seed production are complementary (Berube 1980, Harris and Myers 1984, see also Wheeler and Stoops, 1996).

Establishment of *U. quadrifasciata* in the West is well documented. It is known to occur not only in British Columbia, where it was released, but it has also dispersed to, and become established in, California, Idaho, Montana, Oregon, and Washington (Maddox 1982, Julien 1992, Foote et al. 1993). Although *U. quadrifasciata* was released in eastern North America—Quebec in 1979 and Maryland and New York in 1983—postrelease monitoring has been scant in comparison to that in the West. Establishment was not verified until the early 1990s when it was discovered in Connecticut, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont (Hoebeke 1993). This tephritid has since been found in Maryland, Virginia, and West Virginia (Wheeler and Stoops, 1996).

Recent fieldwork in Minnesota has resulted in the first records of *U. quadrifasciata* from the Midwest. Adults, including several mating pairs, were common on spotted knapweed growing along the railroad at Hinckley (Pine Co.) on 28 June 1995. Eighteen specimens (8 females, 10 males) were

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collected. In a much smaller population of the host (5–6 plants), two females were collected on the same date at Eden Prairie (Hennepin Co.) near Minneapolis. In addition, E.R. Hoebeke made available his record of *U. quadrifasciata* from spotted knapweed in Michigan: Kent Co., Grand Rapids, 11 Aug. 1995. Voucher specimens have been deposited in the insect collection of Cornell University, Ithaca, NY.

*Urophora quadrifasciata* disperses more readily than *U. affinis*, but the latter species tends to become dominant where they co-occur (Berube 1980, Harris 1980, Harris and Myers 1984, Story et al. 1992). The record of *U. quadrifasciata* from Minnesota and Michigan are the first for an area between eastern Montana in the West and western New York and western Pennsylvania in the East. Further collecting in this region is encouraged to document the continued spread of *U. quadrifasciata* and to detect the possible arrival of *U. affinis*.

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