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SPREAD OF *ACENTRIA EPHEMERELLA*
(LEPIDOPTERA: PYRALIDAE) IN CENTRAL NORTH AMERICAB. G. Scholtens¹ and G. J. Balogh²

ABSTRACT

The aquatic moth, *Acentria ephemerella*, was first reported from North America in 1927. Recent records from widespread localities in central North America indicate that the range of this European introduction continues to expand. The moth is well established in the western Great Lakes region and is recorded west to the Missouri River valley in Iowa.

The earliest North American record for the pyralid moth *Acentria ephemerella* (Denis & Schiffermüller) [= *A. nivea* (Olivier)] is from Montreal in 1927 (Sheppard 1945). It was reported from New York localities in the 1930's and 40's (Forbes 1938, Munroe 1947), southern Ontario localities in the vicinity of Lakes Ontario and Erie in the 1940's (Judd 1947, 1950), Massachusetts in the 1950's (Treat 1954), Wisconsin in the 1960's (Batra 1977), and most recently was reported from Minnesota (Newman and Maher 1995). From 1990 through 1995 this species was collected at multiple localities in Michigan, Iowa and Wisconsin. Subsequently, older specimens from Otsego Co., MI and both Tobermory and the Thunder Bay Region of Ontario were found in the collections of Michigan State University and the Canadian National Collection. All new localities are listed in Table 1.

At one time Munroe (1947) considered *A. ephemerella* a native species that had been overlooked prior to the 1920's, but recent authors refer to the species as introduced from Europe (Batra 1977, Buckingham and Ross 1981), where it is well known (Goater 1986, Palm 1986). The relatively recent discovery of the moth in a historically well collected region of North America, the record of its spread into the Great Lakes and other regions (Lange 1956) and the fact that the moth occurs in great abundance at some localities (Judd 1949) argue against *A. ephemerella* being an overlooked native.

Because most adult females of *A. ephemerella* are short lived and entirely aquatic with only rudimentary wings, rapid range expansion would seem to be precluded. However, diapausing larvae form hibernacula attached to host stems [a variety of aquatic plants including the introduced Eurasian water-milfoil, *Myriophyllum spicatum* (Haloragaceae)] which break up in severe weather, especially in fall and winter (Batra 1977). Several authors have indicated the likelihood that these plant fragments are dispersed by currents and boat traffic (Aiken et al. 1979, Smith and Barko 1990). Pieces of transported host stems may become established providing a food supply. It is likely that this is the means by which *Acentria* has spread along the St. Lawrence and Great Lakes drainage. The rarer winged female form provides an addi-

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Table 1. New records of *Acentria* from central North America.

Location	Date	Collector
Ont., Tobermory	31 Aug 1989	K. B. Bolte
Ont., Thunder Bay Region Stanley Area and Stanley	2 & 12 Aug 1980	J. P. Walas
MI, Cheboygan Co. Univ. of Mich. Bio. Station T37N R3W S33	4 Aug 1990	B. G. Scholtens
MI, Chippewa Co. Maxton Plains, Drummond Isl. T43N R6E S34	25 Aug 1990	G. J. Balogh
MI, Kalamazoo Co. Portage, bog on West Lk.	3 Jul 1993 17 Jun 1994	G. J. Balogh
MI, Mackinac Co. Summerbee Fen	14 Aug 1993	G. J. Balogh
MI, Mason Co. Luddington St. Pk.	12 Aug 1995	G. J. Balogh
MI, Otsego Co. T29N R2W S18	22 Aug 1969	M. C. Nielsen
WI, Waukesha Co. Ottawa Lk. Fen T6N R17E S34	26 Jul 1993	T. Barina
IA, Monona Co. Loess Hills State Forest Sioux Twp., S26/27	3 Jul 1992	G. J. Balogh
IA, Woodbury Co. Liberty Twp., S6	1 Jul 1992	G. J. Balogh

tional means of dispersal, especially across drainage basins. However, potential dispersal is limited because adults lack a proboscis and do not feed, and they are short lived (up to 24 hours) (Batra 1977).

Acentria ephemerella has recently been implicated in the biological control of Eurasian watermilfoil, an aquatic weed with significant nuisance potential (Painter and McCabe 1988, Creed et al. 1992, Creed and Sheldon 1994). Thus the spread of *Acentria* and other insect herbivores associated with Eurasian watermilfoil is of considerable interest (Newman and Maher 1995). Unfortunately, a number of factors limit historic monitoring of both insect and plant. Despite the presence of *Acentria* in North America for most of this century, few lepidopterists are familiar with it, and surveys for small moths (*Acentria* has a wingspan of 13-17mm) are geographically and temporally spotty. Lepidoptera are also given limited attention by most aquatic biologists. Eurasian watermilfoil can be confused with native watermilfoil species and may go un-

noticed for many years. Reports of plant occurrence may not be vouchered with herbarium specimens (Aiken et al. 1979, Voss 1985).

At first glance *A. ephemerella* is easily confused with a trichopteran because of the lack of markings, the plain light gray to whitish color (Fig. 1), the reduced number and shape of wing scales and the lack of a proboscis. The latter fact has caused the species to be placed in the Schoenobiinae, but Passoa (1988) has recently shown that, based on characters of the immatures, its correct placement is with the aquatic moths of the Nymphulinae.

The biology of *A. ephemerella* was described in detail by Batra (1977) and Judd (1950). In North America and Europe adults occur from late May to early September with peak adult emergence in July and August. Moths are occasionally observed to swarm in wetlands on favorable warm summer nights. Adults can be collected at light, by sweeping vegetation, and in live traps set over marsh vegetation. In addition to *Myriophyllum* in the Haloragaceae, larvae, in various parts of the range, will also feed on aquatic plants in the families Ceratophyllaceae, Elatinaceae, Hydrocharitaceae, Najadaceae, Potamogetonaceae, Trapaceae and Zannichelliaceae (Buckingham and Ross 1981). Larvae are active from the middle of May into September. Onset and cessation of winter diapause, in the cocoon-like hibernaculum, is dependent on water temperature.

A. ephemerella should be looked for in other localities where aquatic plants are abundant.

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John Fleckenstein of the Iowa DNR and Tim Orwig (Sioux City, IA) facilitated moth survey work and the discovery of *Acentria* in western Iowa during the summer of 1992. The attentive curation of the Michigan State Uni-



Figure 1. Male *Acentria ephemerella* (scale bar = 2 mm).

versity collection by Fred Stehr, Mo Nielsen, and the late Roland Fisher and of the Canadian National microlepidoptera collection by Jean-Francois Landry and Bernard Landry allowed us to locate *Acentria* specimens at those institutions. The University of Michigan Biological Station provided the use of its facilities and financial support for summer collecting. Finally, we thank numerous other lepidopterists and collection managers who kindly answered inquiries.

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