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NOTES ON TAENIOGONALOS GUNDLACHII (HYMENOPTERA: TRIGONALIDAE) FROM WISCONSIN

Steven J. Krauth¹ and Andrew H. Williams¹

ABSTRACT

This is the first report of *Taeniogonalos gundlachii* (Cresson) (Hymenoptera: Trigonalidae) from Wisconsin and of this hyperparasitoid reared from the initial host *Euchaetes egle* (Drury) (Lepidoptera: Arctiidae). Data are provided from 30 Malaise trap specimens and from a single reared specimen.

Taeniogonalos gundlachii (Cresson) (Hymenoptera: Trigonalidae) is a rarely collected hyperparasitoid that generally uses a caterpillar as its initial host (intermediate host, sensu Carmean and Kimsey 1998) and then fully develops only if a parasitoid suitable as an ultimate host, often a tachinid or an ichneu-
monid, is within the caterpillar (Smith 1996, Carmean and Kimsey 1998).

Since 1997, Williams has been studying the fauna restricted to 15 Wisconsin milkweed species (Apocynaceae and Asclepiadaceae) and rearing many immature insects and their parasitoids. *Euchaetes egle* (Drury) (Lepidoptera: Arctiidae) is a distinctive caterpillar that feeds on the foliage of any of several milkweed species and that supports many parasitoids (Arnaud, Jr. 1978, see pg. 2529 in Krombein et al. 1979).

MATERIALS & METHODS

Samples from Townes-style Malaise traps (Townes 1972) using propylene glycol or 95% ethanol were collected in many Wisconsin counties as part of the Wisconsin Insect Survey over 1975 -1977. Wasps were determined by Krauth and specimens are deposited in the University of Wisconsin Insect Research Collection. Plant nomenclature follows Gleason and Cronquist (1991).

RESULTS

There are only 31 known specimens of *T. gundlachii* from Wisconsin. Thirty of these were taken in Malaise traps over 1975 - 1977. These trap samples yielded 27 specimens from one site in Oneida Co., in northeastern Wisconsin, two specimens from Bayfield Co., in northwestern Wisconsin, and one specimen from Jackson Co., in west-central Wisconsin (Table 1). In all, 10 females and 20 males were trapped.

One specimen was reared. A solitary, half-grown, *E. egle* caterpillar was found in Grant Co., in the southwestern corner of the state, on 6 August 2005. It fed on a leaf of *Asclepias purpurascens* growing beside a dirt road in rocky oak woods sloping down to the Mississippi River. It was reared on leaves of *Asclepias syriaca* due to the rarity of *A. purpurascens* in Wisconsin. Later in August, it spun a fragmentary cocoon and pupated. With all other remaining immatures, it was moved to a garage on 20 October, and then was returned to lab conditions on 3 February 2006. An adult wasp (Figs. 1 and 2) appeared on 29 April 2006, having chewed an exit hole through the side of the abdomen of the arctiid's pupa (Fig. 3). Most adult *E. egle*, other herbivores, and their parasitoids emerged prior to *T. gundlachii*; 29 April was essentially the end of this annual rearing exercise. The *E. egle* pupa was softened in soapy water

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Table 1. Collection data of *Taeniogonalos gundlachii* taken in Wisconsin. One reared specimen is from Grant County. Thirty other specimens are from Townes-style Malaise trap samples.

COUNTY SEX	LOCATION	DATE	NUMBER,
Bayfield	T46N R9W Sect. 16	5 - 12 July 1977	1♂
		19 - 26 July 1977	1♀
Grant	T4N R6W Sect. 26, 35	reared	1♀
Jackson	T21N R4W Sect. 27	30 June - 8 July 1975	1♂
Oneida	T35N R11E Sect. 17	1 - 8 July 1975	1♂
		8 - 14 July 1975	2♀
		14 - 22 July 1975	1♀, 3♂
		22 - 29 July 1975	1♀, 4♂
		29 July - 5 August 1975	1♀, 2♂
		5 - 12 August 1975	2♂
		12 - 25 August 1975	1♂
		6 - 13 July 1976	1♀, 1♂
		13 - 20 July 1976	1♀, 1♂
		20 - 27 July 1976	1♀, 1♂
		27 July - 2 August 1976	2♂



Figure 1. *Taeniogonalos gundlachii* reared from the initial host *Euchaetes egle*, a previously unreported initial host of this hyperparasitoid.



Figure 2. Front view of the head of *Taeniogonalos gundlachii* showing its relatively massive mandibles.



Figure 3. Pupa of *Euchaetes egle* showing exit hole of *Taeniogonalos gundlachii*.

for 48 hrs and dissected. One tachinid puparium was extracted but specific determination was not possible as its spiracles were destroyed.

Scores of Malaise trap samples collected since 1977 and hundreds of samples from window traps (Chandler 1987, Chatzimanolis et al. 2004), another kind of flight intercept trap widely used in Wisconsin since 1990, have failed to yield more *T. gundlachii* specimens. We have no explanation for this.

DISCUSSION

Smith (1996) found 440 *T. gundlachii* in Townes-style Malaise trap samples taken over 12 years of season-long trapping in Virginia, Maryland, and West Virginia. He reported the wasp from mid-May through the first week in October, with its peak flight from mid-June through the first third of July. He also noted its presence in low numbers through the rest of the season with a very low peak from the end of August through the first third of September. Our 30 Wisconsin specimens represent trapping dates 30 June - 30 August, though most were taken in July.

Weinstein and Austin (1991) characterized the genus *Taeniogonalos* as allowing their initial hosts to complete cocoon formation. They also wrote that adult trigonalids use their mandibles (Fig. 2) to cut emergence holes (Fig. 3) in the side of the host cocoon/puparium (Ichneumonidae, Tachinidae, Lepidoptera) and that, in temperate regions, emergence tends to occur in spring or summer, with both initial host and trigonalid being univoltine. In Wisconsin, *E. egle* is univoltine, and the events documented in rearing this one wasp support these authors' generalizations.

This is the first report of this wasp reared from the initial host, *E. egle*. Smith (1996) and Carmean and Kimsey (1998) summarized the known initial hosts of *T. gundlachii* as caterpillars in Arctiidae (a label bearing the name "*Apantesis anna*"); Megalopygidae (a label bearing "*Megalopyge opercularis*"); Noctuidae (*Acronicta lobeliae* Guenee, *Phosphila turbulenta* Hubner, and a label bearing "*Hadena turbulenta*"); Notodontidae (labels bearing "*Macrurocampa marthesia*" and "*Symmerista albifrons*"); Saturniidae (*Automeris io* (Fabricius) and labels bearing "*Anisota discolor*" and/or "*Anisota senatoria*"); and probably other large caterpillars; and both cite Gelhaus' (1987) report of a larva in Tipulidae (*Tipula* sp., probably *flavoumbrosa* Alexander), in Diptera.

This is the first report of *T. gundlachii* from Wisconsin. Despite its having been rarely collected in this state, our collection data indicate this wasp is distributed over most of Wisconsin, even to its southwestern and northwestern corners. Carlson (1979) summarized this species' range as, "southeastern Massachusetts south to mid-Florida, west to southern Ohio and southwestern Louisiana." Gelhaus (1987) added Kansas, Smith (1996) added Texas, and Carmean and Kimsey (1998) added Canada, Costa Rica and Central America.

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