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THE FIELD STATUS OF PARASITES OF THE EUROPEAN
CORN BORER AT THE CLOSE OF 1941

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The introduction and establishment of foreign parasites and the increasing importance of this biologic factor in the natural control of the European corn borer (Pyrausta nubilalis (Hbn.)) in various localities in the United States have led to a development in the parasite situation which may be followed in this report in conjunction with similar reports listed in various supplements of the Insect Pest Survey Bulletin¹ of the United States Department of Agriculture.

The status of the corn borer parasites in the field has not been and is not now in a static condition. There has been a considerable enlargement in the size of the territory in which the exotic parasites are attacking the borer, and this improving condition can be expected to continue as the parasites disperse into previously unoccupied territory and as additional releases are made in new and widely separated localities. In several localities the parasites have become abundant enough to cause appreciable mortality in the borer population.

At the close of 1941, parasite surveys were conducted at 12 localities located in or including parts of nine States. The size of these areas ranged from 7 square miles at a locality in Michigan to 2,375 square miles in southeastern New England. A total of 19,273 host larvae were collected, isolated in individual containers, and observed for parasitization. Of the 17 species of larval parasites of the corn borer imported from Europe and the Orient and released in the United States, only the 5 species discussed in this report were recovered from the collections made at the close of 1941. A summary showing the status of these five -- Chelonus annulipes Wesm., Eulophus viridulus Thoms., Inareolata punctoria (Roman), Lydella grisescens R. D., and Macrocentrus gifuensis Ashm. -- is given in table 1.

The figures on borer parasitization in table 1 tend to be low since the territory covered by most of the survey localities included locations at the perimeters of parasite dispersion. Parasitization near the center of release points where the parasites have been established for some time are in most cases somewhat higher, and in some localities much higher than the table figures.

¹/ The supplements referred to are found in the following issues:
Vol. 18, No. 9, Dec. 20, 1938; Vol. 19, No. 8, Oct. 15, 1939; Vol. 20, No. 9,
Dec. 1, 1940; Vol. 21, No. 9, Dec. 15, 1941.

Table 1.--Summary of European corn borer parasitization in various localities at the close of 1941

Locality	Area surveyed	Hosts observed	Parasitization by--					Total
			Lydella grisescens	Inareolata punctoria	Macrocentrus gifuensis	Chelonus annulipes	Eulophus viridulus	
	Sq. miles	Number	Percent	Percent	Percent	Percent	Percent	Percent
Massachusetts								
Middlesex Co.	36	1,553	0.9	6.8	0	0	0	7.7
New England								
Southeastern	2,375	4,295	3.2	2.6	3.8	0.2	0	9.8
Connecticut								
Central	1,452	4,273	2.6	4.8	T*	T*	0	7.6
New York								
Hudson River Valley	38	148	0.7	0	0	2.7	-	3.4
New Jersey								
Colt's Neck								
Regular survey		1,434	8.2	4.3	1.3	0	-	13.8
Supplementary survey		775	9.5	0	0	0	-	9.5
Subtotal	227	2,209	8.6	2.8	0.8	0	-	12.2
Burlington								
Regular survey		3,177	20.7	0	0	0	-	20.7
Supplementary survey		857	1.1	0	0	0	-	1.1
Subtotal	227	4,034	16.5	0	0	0	-	16.5
Virginia								
Eastern Shore	88	388	2.6	0	0	0	-	2.6
Onley	24	385	2.1	0	0	0	-	2.1
New York								
Catt. Ind. Res.	78.5	775	0	2.7	0	0	0	2.7
Ohio								
Sandusky	7	311	31.8	0	0	0	0	31.8
Bono	12	606	19.8	0	0	0	3.1	22.9
Michigan								
Erie	7	296	23.6	0	0	0	0.3	23.9

* T, Trace, less than 0.1 percent parasitization.

Lydella grisescens R. D.

The introduced tachinid Lydella grisescens is present east of Worcester and Fitchburg, Mass., but borer parasitization by it is low throughout most of this territory except near the shore around Buzzards Bay, where parasitization by the tachinid in several collections was over 25 percent in 1941.

In central Connecticut Lydella grisescens has spread rapidly and is now present over approximately 1,400 square miles. It is more abundant west of the Connecticut River than east of it. Parasitization is rather low, but in individual fields it often exceeds 10 percent.

In New Jersey Lydella grisescens is present in an area of over 227 square miles around the town of Colt's Neck in Monmouth County. Individual collections were often 20 percent parasitized, and the average was from 3.5 percent at the close of 1940 up to 9.1 percent at the close of 1941 in the central portion of the surveyed locality. This parasite had attacked 20.7 percent of the 3,177 hosts collected in Burlington County. Many collections showed over 25 percent parasitization by this species, several 50 percent, and one over 85 percent. It has crossed the Delaware River from Burlington and is present in Bucks County, Pa.

Lydella grisescens was the only parasite recovered in Virginia at the close of 1941. It had parasitized over 10 percent of the hosts in two collections obtained near the Maryland State line in northern Accomac County on the Eastern Shore of Virginia. It was present, but scarce, in the central part of the Eastern Shore around the town of Onley. An informal survey showed that it was abundant in a limited locality around a recent release point on the mainland near Back Bay in Princess Anne County, Va.

This parasite was also present and abundant along the shore of Lake Erie. The average borer parasitization was 32 percent at Sandusky, Erie County, Ohio; 23 percent near Toledo, Lucas County, Ohio; and 24 percent in Monroe County, Mich. In one collection in the last locality 75 percent of the hosts collected were parasitized by this tachinid.

Inareolata punctoria (Roman)

Another parasite, Inareolata punctoria, is present over an area of approximately 600 square miles in eastern Massachusetts. At the close of 1941 it was only about half as abundant as usual in this State, probably because of the very low status of the corn borer population. The parasite was recorded in Rockingham County, N. H., where it had parasitized 13 percent of the borers observed. I. punctoria is present over a territory of approximately 800 square miles in central Connecticut, where it is the most important parasite present. It is continuing to spread and increase in this State. This ichneumonid is firmly established at the more recently established parasite release point in Monmouth County, N.J., where it is present over an area of 30 square miles. It is also present in a locality of approximately 50 square miles in western New York State around the Cattaraugus Indian Reservation, but borer parasitization by it was low here at the close of 1941, being only 2.7 percent of the hosts observed.



Macrocentrus gifuensis Ashm.

The polyembryonic braconid Macrocentrus gifuensis is well established in southeastern Massachusetts, central Connecticut, and Monmouth County, N. J. It was most important in Massachusetts, where borer parasitization was lower in 1941 than for several years previous, but nevertheless in several collections over 25 percent of the hosts observed had been killed by this parasite. At the newer points of establishment in Connecticut and New Jersey the species is neither widely distributed nor abundant as yet, but it seems to be paralleling in proper sequence the history of its rise in southeastern Massachusetts.

Chelonus annulipes Wesm.

An imported parasite recovered in southeastern Massachusetts, central Connecticut, and the Hudson River Valley of New York is Chelonus annulipes. It is of little importance in any of these localities and may not survive in the last two, since the specimens recorded were few in number and represent recoveries from relatively recent releases.

Eulophus viridulus Thomson

An introduced parasite that was unreported for a number of years has increased steadily in the last few seasons in Lucas County, Ohio, and was again recovered in Monroe County, Mich. This is Eulophus viridulus. It was much more numerous at the close of 1941 than in 1940, but borer parasitization is still low (3.1 percent in Ohio).