

NATURAL CONTROL of the EUROPEAN CORN BORER

by

PARASITES

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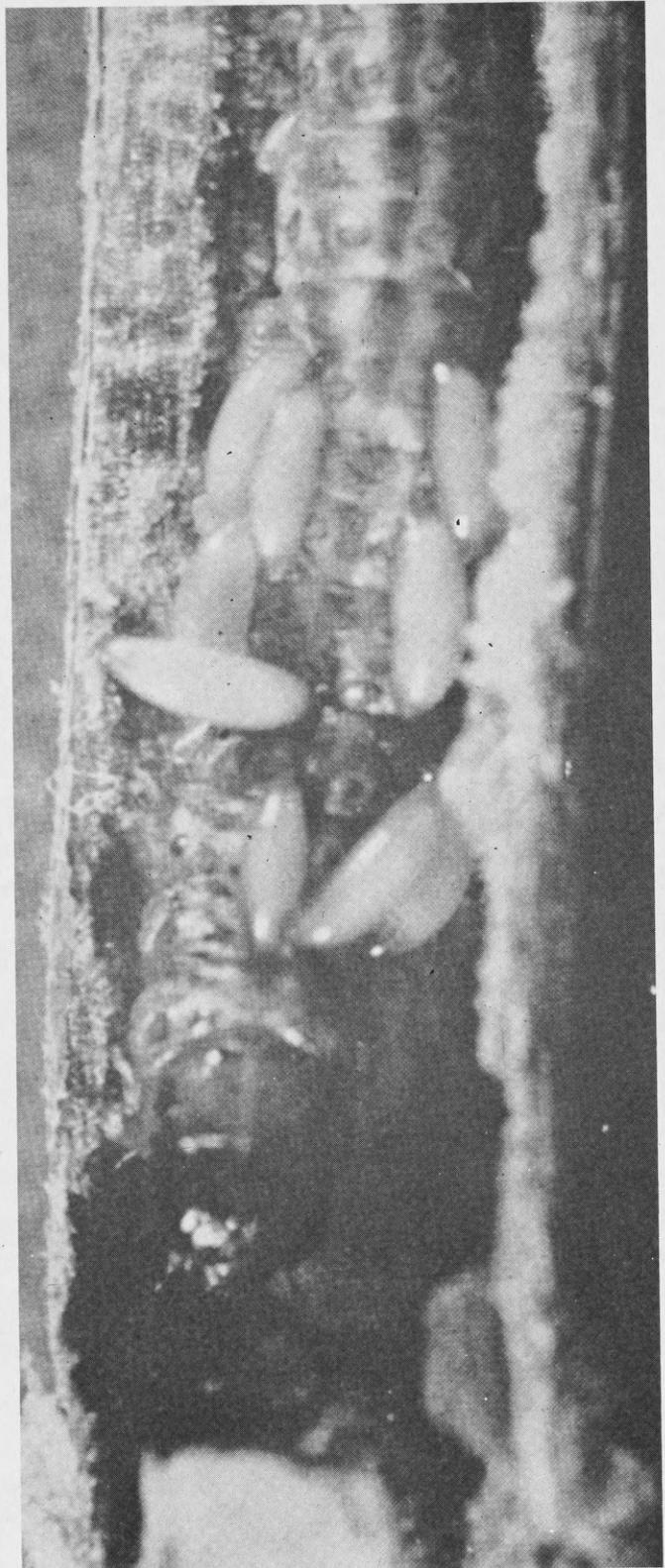
Introduction

Parasitism is a natural control factor affecting insect populations. Several species of insects parasitize the European corn borer, *Ostrinia nubilalis* (Hübner). Most parasitism is associated with the larval stage of the borer, but Huber *et al.* (1928) observed that eggs and pupae are sometimes affected by parasites. Clark (1934) suggested that a combination of parasites was responsible for control in the Orient. Baker *et al.* (1949) summarized early work involving the importation of foreign parasites into the United States for borer control.

Blickenstaff *et al.* (1953) summarized the status of parasites in Iowa. *Lydella grisescens* R. D., a fly, and *Sympiesis viridula* (Thoms.), a wasp, were

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Larvae of a parasitic wasp on a borer killed by their feeding.

recovered in Boone county, Iowa. Rolston *et al.* (1958) found that of 18 species of corn borer parasites released in Ohio, *L. grisescens*, *S. viridula*, and *Horogogenes punctorius* (Roman); a wasp, had become established permanently. *L. grisescens* was the most abundant.

During the summer of 1951, three species of corn borer parasites were released in southeastern North Dakota (Munro *et al.*, 1952). Included in the release were *L. grisescens*, and the wasps *Chelonus annulipes* Wesm. and *Macrocentrus gifuensis* Ashm. There is no evidence that any of these became established. Although not released in North Dakota, *S. viridula* has been recovered and appears to have established itself in several southeastern counties, (Frye and Brandvik, 1967).

Procedures

Corn borer larvae collected in the fall from all sections of the state during the period 1964 through 1969 were examined for parasites. The incidence of parasitism and the distribution of parasites were determined. *S. viridula* is an external

Table 1. Parasites recovered from fall collected corn borer larvae, North Dakota, 1963-1969.

Year	County	Larvae examined ¹	Percent incidence of borers with	
			<i>Sympiesis viridula</i>	<i>Pyraustomyia penitalis</i>
1963	Cass	53	1.9	0
1964	Cass	358	3.4	0
	Ransom	106	3.8	0
	Richland	155	3.2	0
	Sargent	100	0	0
1965	Cass	200	3.0	0
	Ransom	50	2.0	0
	Richland	250	0.8	0
	Sargent	100	0	0
1966	Cass	315	2.5	0
	Ransom	24	0	0
	Richland	17	0	5.9
	Sargent	25	0	0
1967	Cass	50	10.0	0
	Ransom	50	2.0	2.0
	Richland	50	0	0
	Sargent	50	0	0
1968	Cass	50	6.0	0
	Ransom	50	0	0
	Richland	50	12.0	0
	Sargent	400	1.8	0
1969	Cass	150	4.0	0
	Ransom	100	0	0
	Richland	100	4.0	0
	Sargent	100	1.0	0
	Trail	185	2.7	0

¹Some of the determinations were made at the Corn Borer Investigations Laboratory, Ankeny, Iowa.

parasite, and examinations were made in the field or in the laboratory after small stages of the parasite had had time to develop. The native fly *Pyraustomyia penitalis* (Coq.) was reared from collections of borers incubated in the laboratory.

Results and Discussion

Parasites recovered from corn borer larvae collected in North Dakota during 1963-1969 are tabulated in Table 1.

S. viridula was not released in North Dakota, but found its way into the southeastern corner of the state. It appears to be established and has had some effect on borer populations, especially in Cass county during 1967 and 1968 and in Richland county during 1968. It was recovered in Cass county each year of the study (Table 1). The parasite extended its distribution westward during 1968 when it was recorded for the first time in Sargent county (Table 1). It was found in Traill county during 1969, thus extending its northern limit of distribution. This is evidence that the parasite may be gradually extending its range to the west and the north. It is interesting to note that *S. viridula* was found mostly on borers from the upper one-third of the plant. However, the significance of this is not clear.

P. penitalis was found in only two larvae during the seven-year period. It is doubtful if this parasite had any real impact upon the borer population.

Summary

The wasp *Sympiesis viridula* (Thoms.) was the only parasite of the European corn borer which appeared consistently. It was found only in the southeastern corner of the state. The incidence was low, but the parasite appears to be maintaining itself. As a natural enemy, parasites are only one of several environmental factors affecting borer populations.

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