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PARASITES OF *PIERIS RAPAE* L. IN SOUTH-EASTERN QUEENSLAND

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SUMMARY

In spring, the principal parasites of *Pieris rapae* were *Apanteles glomeratus* for the larvae, and *Pteromalus puparum*, *Brachymeria regina* and *Compsilura concinnata* for the pupae.

The highest level of parasitism by *A. glomeratus* was 67%, and the highest pupal parasitism was approximately 63% by *P. puparum*.

I. INTRODUCTION

The cabbage white butterfly, *Pieris rapae* L., is a major pest of cabbage and other cruciferous crops in Australia, and other temperate and subtropical regions of the world (Bonnemaison, 1965). It was accidentally introduced into Melbourne, Victoria, in 1939 from New Zealand (McCubbin, 1971). It then spread to many parts of Australia.

Due to the absence of effective native parasites, the population of *P. rapae* built up rapidly (Pescott, 1939). Later, parasites were imported into Victoria and Tasmania: the pupal parasite *Pteromalus puparum* L. (Hymenoptera: Pteromalidae) from New Zealand, the A.C.T. and New South Wales; the larval parasites *Apanteles glomeratus* L. from Canada and England; and *Apanteles rubecula* Marsh (Hymenoptera: Braconidae) from England and Switzerland.

Except for the work of Rahman (1966) in South Australia and R. E. Teakle (unpublished) in south-eastern Queensland, there is no recent report of quantitative data on parasitism of field populations of *P. rapae* in any part of Australia.

This report presents data on parasitism of spring populations of *P. rapae* at three localities in south-eastern Queensland: Gatton, Brisbane and Redland Bay.

II. MATERIALS AND METHODS

In July 1973, approximately 500 cabbage plants were established at each of three localities: Brisbane (campus of the University of Queensland, St. Lucia), Gatton (Queensland Agricultural College, Lawes, 80 km west of Brisbane), and Redland Bay (40 km east of Brisbane). In 1974, plants were established at Brisbane and Gatton only.

The pupae and fifth instar larvae of *P. rapae* were collected from the cabbage plants on the sampling dates shown in tables 1, 2, 3 and 4. The larvae were reared on cabbage leaves at 25°C. The pupae were also kept at 25°C. The number of parasitized hosts was determined after the parasites emerged.

III. RESULTS AND DISCUSSION

The principal parasites obtained were *A. glomeratus* from the larvae and *P. puparum*, *Brachymeria regina* Girault (Hymenoptera:Chalcididae) and *Compsilura concinnata* Meig. (Diptera:Tachinidae) from the pupae (Tables 1, 2, 3 and 4). Pupal parasites of minor importance were the ichneumonid *Coryphus turneri* and other *Brachymeria* and *Coryphus* spp.

Two batches of *A. glomeratus* pupae were hyperparasitized by a hymenopteran spp. of Eurytomidae.

R. E. Teakle (unpublished) also recorded similar parasites of *P. rapae* at four localities (Stanthorpe, Gatton, Redlands, and Rochedale) in south-eastern Queensland.

The highest larval parasitism was 67% in October 1974 at Gatton. The highest pupal parasitism was approximately 63% by *P. puparum* in November 1974 at Gatton.

In Brisbane, *B. regina* has been a common pupal parasite of *P. rapae* (tables 2 and 4), though in 1974 the tachinid *C. concinnata* was the dominant pupal parasite. Neither of these two species has previously been recorded as parasites of *P. rapae* in Australia. However, the genus *Brachymeria* is relatively common in Australia and parasitizes a wide range of hosts, mostly Lepidoptera (Riek, 1970).

The levels of parasitism obtained seem to indicate that the various parasites of *P. rapae* do not control *P. rapae* numbers below damaging level.

TABLE 1
PERCENTAGE PARASITISM OF FIELD POPULATIONS OF THE LARVAE OF *P. rapae* (1973)

Locality	Date (1973)	Number collected	Number parasitised	% parasitism	Parasites
Gatton	29 Aug ..	109	30	27.5	<i>Apanteles glomeratus</i> <i>A. glomeratus</i>
	24 Sep ..	69	34	49.3	
Brisbane	20 Sep ..	15	0	0	<i>A. glomeratus</i> <i>A. glomeratus</i>
	28 Sep ..	20	0	0	
	4 Oct ..	30	0	0	
	24 Oct ..	23	3	13.0	
	1 Nov ..	19	8	42.1	
Redland Bay ..	17 Oct ..	251	0	0	
	14 Nov ..	30	0	0	

TABLE 2

PERCENTAGE PARASITISM OF FIELD POPULATIONS OF THE PUPAE OF *P. rapae* (1973)

Locality	Date (1973)	Number collected	Number parasitised	% parasitism	Parasites
Gatton	29 Aug ..	42	2	4.8	<i>Pteromalus puparum</i> <i>P. puparum</i> , Tachinid (<i>Winthemia</i> spp.)*
	24 Sep ..	51	3	5.9	
Brisbane	13 Sep ..	30	0	0	<i>Brachymeria regina</i> <i>B. regina</i> <i>B. regina</i> , Tachinid (<i>Winthemia</i> spp.)* <i>B. regina</i> , Ichneumonid* <i>B. regina</i> <i>B. regina</i>
	20 Sep ..	42	5	11.9	
	28 Sep ..	60	15	25.0	
	4 Oct ..	34	16	47.1	
	24 Oct ..	25	11	44.0	
	1 Nov ..	18	10	55.6	
14 Nov ..	5	2	40.0		
Redland Bay ..	17 Oct ..	16	1	6.3	<i>P. puparum</i>
	14 Nov ..	30	0	0	

* Minor parasites.

TABLE 3

PERCENTAGE PARASITISM OF FIELD POPULATIONS OF THE LARVAE OF *P. rapae* (1974)

Locality	Date (1974)	Number collected	Number parasitised	% parasitism	Parasites
Gatton	24 Sep ..	60	12	20.0	<i>A. glomeratus</i> <i>A. glomeratus</i> <i>A. glomeratus</i>
	16 Oct ..	141	23	16.3	
	30 Oct ..	103	69	67.0	
Brisbane	11 Oct ..	82	2	2.4	<i>A. glomeratus</i> <i>A. glomeratus</i> <i>A. glomeratus</i>
	25 Oct ..	130	9	6.9	
	8 Nov ..	15	2	13.3	

TABLE 4

PERCENTAGE PARASITISM OF FIELD POPULATIONS OF THE PUPAE OF *P. rapae* (1974)

Locality	Date (1974)	Number collected	Number parasitised	% parasitism	Parasites
Gatton	24 Sep ..	10	0	0	<i>P. puparum</i> , <i>Brachymeria</i> spp.* <i>P. puparum</i> , <i>Brachymeria</i> spp.* <i>P. puparum</i> , <i>Brachymeria</i> spp.*
	16 Oct ..	356	12	3.4	
	30 Oct ..	134	83	62.0	
	13 Nov ..	30	19	63.3	
Brisbane	12 Aug ..	55	13	23.6	<i>Compsilura concinnata</i> , <i>P.</i> <i>puparum</i> *, <i>B. regina</i> * <i>C. concinnata</i> , <i>P. puparum</i> * <i>C. concinnata</i> , <i>P. puparum</i> *, <i>Brachymeria</i> spp.* <i>C. concinnata</i> , <i>P. puparum</i> *, <i>Brachymeria</i> spp.*
	30 Aug ..	62	19	30.7	
	20 Sep ..	96	50	50.1	
	11 Oct ..	10	6	60.0	

* Minor parasites.

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