

## A VIRUS DISEASE OF PIERIS RAPAE (L.) IN QUEENSLAND

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### SUMMARY

The incidence of a virus with particles of similar measurements to those of the *P. rapae* granulosus virus *Bergoldia virulentum* is discussed.

The cabbage white butterfly (*Pieris rapae* (L.)) was introduced to Australia from New Zealand about 1939 and has subsequently become a major pest of crucifers. A virulent granulosus virus disease was reported by Wilson (1960) from field-collected larvae at Canberra (Australian Capital Territory) and under experimental conditions artificially applied aqueous suspensions of the virus were found to induce epizootics in natural infestations of *P. rapae* in the field.

During a study of natural factors regulating insect numbers on cabbages in south-eastern Queensland, considerable mortality of *P. rapae* larvae was observed from a disease producing symptoms similar to those reported by Wilson (1960). Dead larvae tended to remain attached to the plant, were soft and "squashy" and ruptured readily, releasing a liquid containing minute particles approximately  $375 \times 200 \text{ m}\mu$  in size. Treatment of a purified suspension of the particles with dilute alkali by the method of Bergold (1963, p. 536) resulted in the liberation of rod-shaped virus particles. Thirty-two of these measured  $301.7 \pm 6.3 \times 47.1 \pm 0.6 \text{ m}\mu$ , which is in good agreement with the measurements of  $293.6 \pm 23.7 \times 46.9 \pm 7.5 \text{ m}\mu$  given for the *P. rapae* granulosus virus *Bergoldia virulentum* Tanada (Tanada 1956).

Virus-killed larvae were observed on batches of unsprayed cabbages grown in the glasshouse and exposed to insect infestation in the field for periods of a month, and on commercially-grown cabbages and cauliflowers in several areas.

The disease was particularly apparent at Rochedale, near Brisbane, in December 1966, when *P. rapae* numbers were at peak. On a plot of 3,750 cabbages which had not been sprayed for about 8 weeks, an average of nine virus-killed larvae per plant was recorded, representing a 95% mortality. Of the survivors, 84% were in their first or second instar.

A virus epizootic was again observed in July 1967, on an adjacent plot of cauliflowers. The plants had been sprayed 2 weeks earlier for a heavy *P. rapae* infestation which had developed during a period of prolonged rain. The incidence of granulosis is given in Table 1. Harvesting of the crop was completed 3 weeks later and during this period no significant build-up in numbers of *P. rapae* larvae occurred.

TABLE 1

INCIDENCE OF GRANULOSIS IN *P. rapae* LARVAE ON A SAMPLE OF 128 PLANTS ON A COMMERCIAL CAULIFLOWER PLANTING AT ROCHEDALE IN JULY 1967

| Larval Instar | Live | Virus-killed | Total |
|---------------|------|--------------|-------|
| 1             | 36   | 7            | 43    |
| 2             | 26   | 19           | 45    |
| 3             | 30   | 8            | 38    |
| 4             | 5    | 19           | 24    |
| 5             | 6    | 112          | 118   |

Studies of the role of this virus in regulating numbers of *P. rapae* in southern Queensland are continuing.

## REFERENCES

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