

## Key to the Puparia of the Dipterous Parasites of *Choristoneura fumiferana* Clem.<sup>1</sup>

By D. A. Ross<sup>2</sup>

The frequent failure of parasite development beyond the immature stages during insectary rearing work often results in incomplete qualitative and quantitative data on insect parasites. Keys to the larval and pupal stages are therefore an extremely useful aid in completing the picture in a study of a parasite complex.

The following illustrated key makes it feasible to obtain reasonably accurate specific determinations of the puparia of the dipterous parasites of the spruce budworm, *Choristoneura fumiferana* Clem., that occur in Canada. The writer gratefully acknowledges the inspiration and co-operation of A. R. Brooks during the preliminary preparations for the key. The illustrations were executed by Miss M. MacKay (Figs. 1-14) and B. Sugden (Fig. 15). Each figure illustrates the following: (a) posterior aspect of a puparium showing the location of the stigmal plates and the anal aperture, and any protuberances that are present; (b) one stigmal plate and the stigmal slits; (c) lateral aspect of the outline of a puparium.

### Key to Puparia of Dipterous Parasites of Spruce and Jack Pine Budworm

- |   |         |
|---|---------|
| 1. Spiracles in a deep cavity, partly hidden from view..... | Group A |
| Spiracles not in cavity.....                                | 2       |
| 2. Four slits in each stigmal plate.....                    | Group B |
| Three slits in each stigmal plate.....                      | Group C |

#### Group A

*Spiracles in a deep cavity*

- |  |  |
|--|--|
| 1. Opening of cavity, circular, fairly smooth edge.....    | (Fig. 1) <i>Pseudosarcophaga affinis</i> (Fall.) |
| Opening of cavity broadly elliptical, edge sculptured..... | (Fig. 2) <i>Sarcophaga aldrichi</i> Park.        |

#### Group B

*Four slits in each stigmal plate*

- |   |  |
|---|--|
| 1. Spiracular slits only slightly curved.....   | 2  |
| Spiracular slits serpentine; shallow protuberance ventrad to stigmal plates.....  | 3  |
| 2. Stigmal plates protruding; slits, oblique, sometimes fourth slit much reduced.....   |  |
|   | (Fig. 3) <i>Phorocera incrassata</i> Sm.     |
| Stigmal plates only slightly raised, stigmal slits almost horizontal.....   |  |
|   | (Fig. 4) <i>Phorocera erecta</i> Coq         |
| 3. Small, shallow, darkly pigmented swelling dorsad to stigmal plates; central portion of stigmal plate lighter in colour than the bevelled edge..... |  |
|   | (Fig. 6) <i>Madremyia saundersii</i> (Will.) |
| Dorsal swelling absent; stigmal plate apparently uniformly black.....   |  |
|   | (Fig. 5) <i>Phryxe pecosensis</i> (Tns.)     |

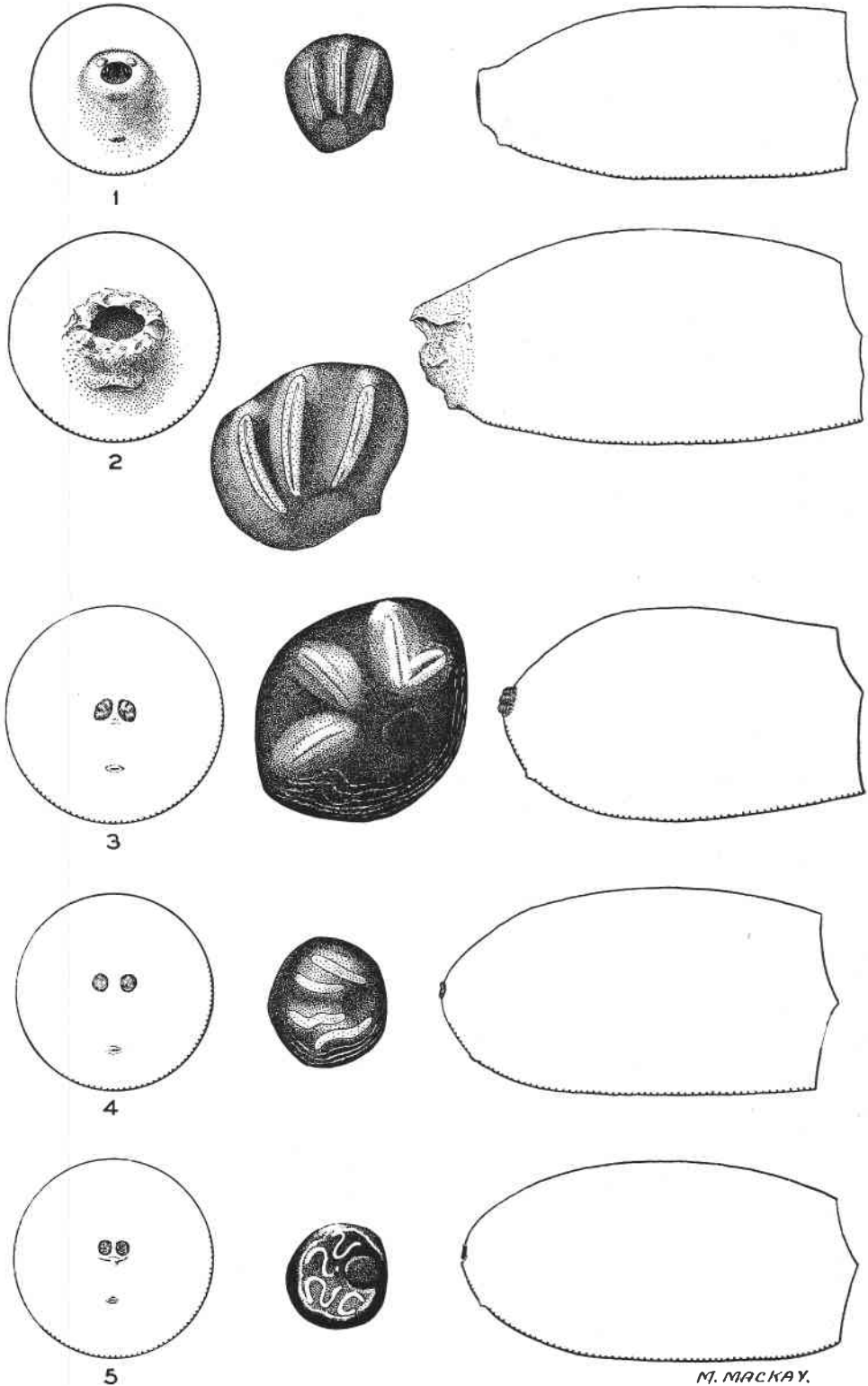
#### Group C

*Three slits in each stigmal plate*

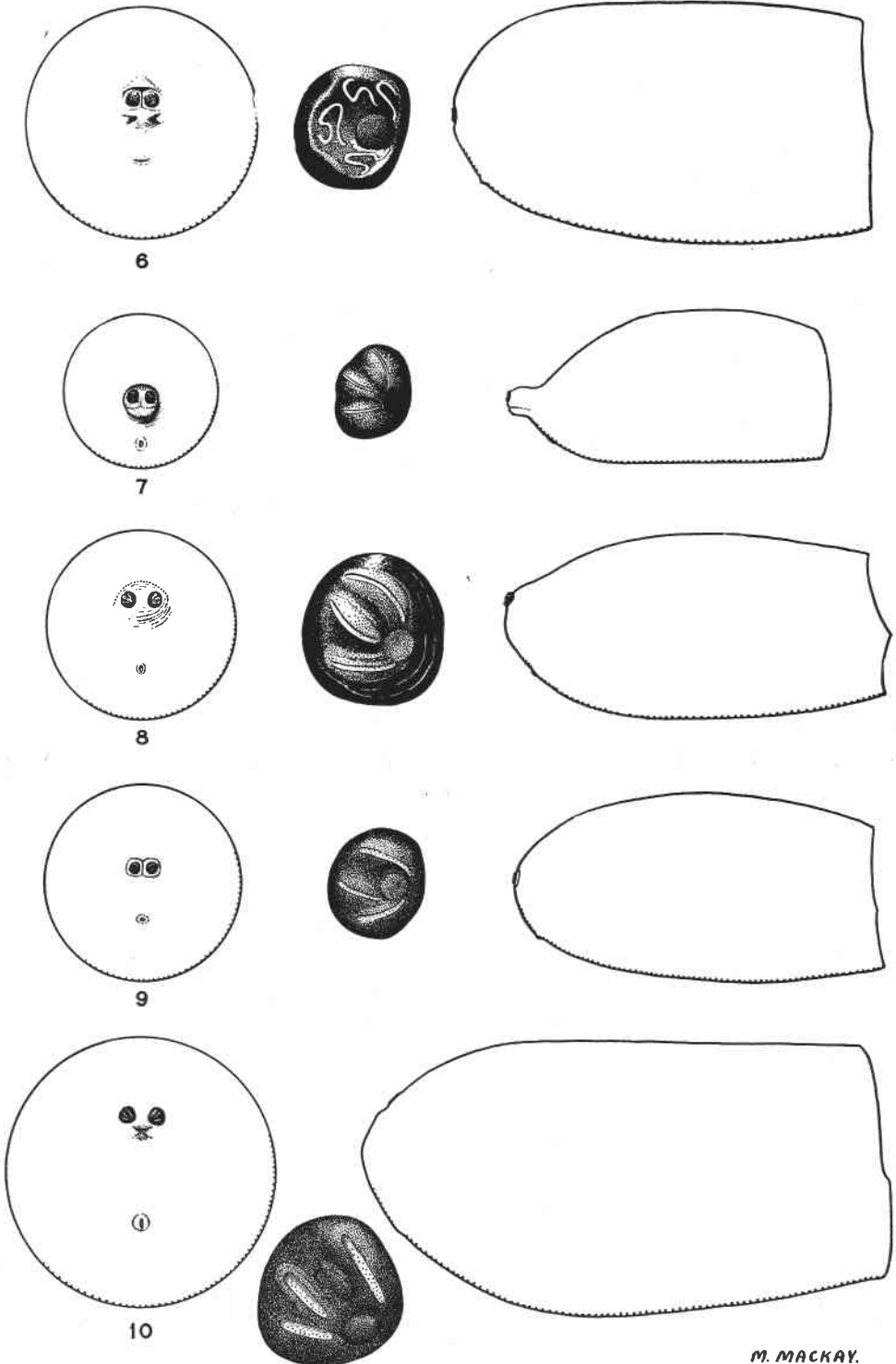
- |  |  |
|--|--|
| 1. Stigmal plates borne on a broad column.....   | (Fig. 7) <i>Actia interrupta</i> Curr.       |
| Stigmal plates not borne on a column.....  | 2  |
| 2. Spiracles situated at a distance at least three times the diameter of the stigmal plate above the horizontal axis of the puparium; stigmal plates flush with the surface of the puparium..... | (Fig. 10) <i>Tachinomyia nigricans</i> Webb. |
| Spiracles situated at a distance less than three times the diameter of the stigmal plate above the horizontal axis of the puparium.....  | 3  |
| 3. Stigmal plates small, encircled by a groove; puparium rugose, no protuberances.....   |  |
|  | (Fig. 9) <i>Lypsa setifacies</i> (West)      |
| Stigmal plates medium to large, not encircled by a groove, protuberances generally present   | 4  |

<sup>1</sup>Contribution No. 24, Division of Forest Biology, Science Service, Department of Agriculture, Ottawa, Canada.

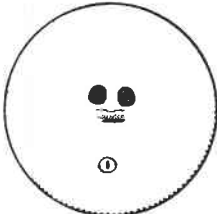
<sup>2</sup>Forest Insect Laboratory, Vernon, B.C.



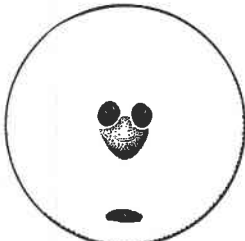
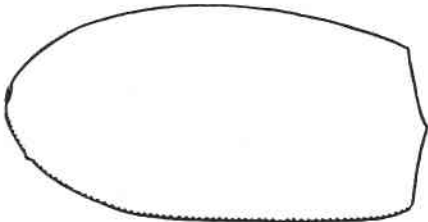
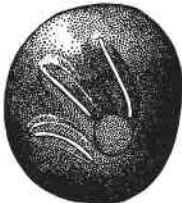
M. MACKAY.



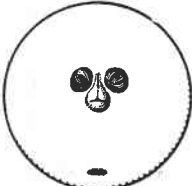
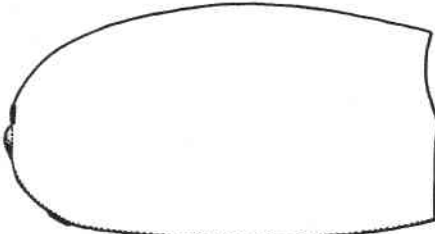
M. MACKAY.



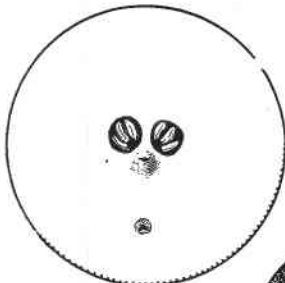
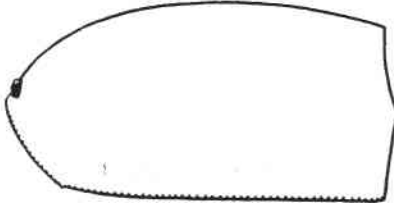
11



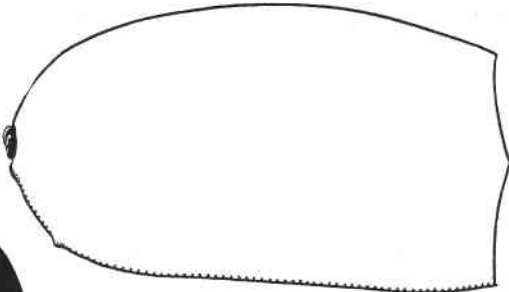
12



13



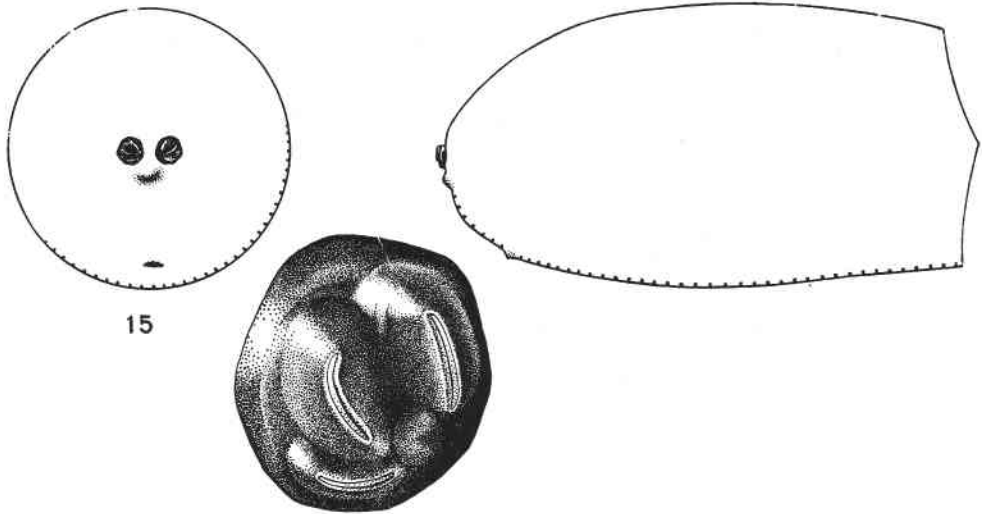
14



2 mm.

0.2 mm.

M. MACKAY.



4. Puparium slightly depressed above the stigmal plates and broadly rounded beneath; stigmal plates protruding, directed upward slightly..... (Fig. 8) *Nemorilla pyste* (Wlk.)  
Puparium not as above..... 5
5. Protuberance (usually present) ventrad to stigmal plates very small; stigmal plates only slightly raised; puparium glossy..... (Fig. 11) *Aplomya caesar* (Ald.)  
Protuberance ventrad to stigmal plates prominent..... 6
6. Stigmal plates not protruding, only slightly raised; slits on very small ridges.....  
(Fig. 12) *Omotoma fumiferanae* (Tll.)..... 7
7. Stigmal plates protruding; slits on prominent ridges.....  
Protuberance usually juts out beyond the stigmal plates, ridges bearing stigmal slits broadly rounded..... (Fig. 13) *Phorocera tortricis* Coq.  
Protuberance shallower than the stigmal plates..... 8
8. Ridges bearing long stigmal slits, narrow distally and broad at the base.....  
(Fig. 14) *Ceromasia aurifrons* Tns.  
Ridges bearing short stigmal slits, broadly rounded, not as prominent as in *Ceromasia aurifrons*..... (Fig. 15) *Ceromasia auricaudata* Tns.

### A Note on a Dipterous Predator of the Onion Maggot, *Hylemya antiqua* (Meig.)

By J. P. PERRON AND J. LAFRANCE

Field Crop Insect Laboratory, Division of Entomology  
Canada Department of Agriculture, St. Jean, Quebec

In investigations on the life-history of the onion maggot at St. Jean, Que., in 1951, a few specimens of a dipterous predator were found in the rearing cages in the laboratory. They were feeding voraciously on the adults, destroying a colony of nearly 300 flies within two weeks.

Specimens were identified by Mr. A. R. Brooks, Systematic Entomology, Division of Entomology, Saskatoon, Sask., as *Coenosia tigrina* (F.). Mr. G. E. Shewell, Systematic Entomology, Division of Entomology, Ottawa, has stated that nothing is known in Canada about the life-history of this species, but that it is apparently well known as a predator in Europe and that B. M. Hobby\* has published a long list of species on which it preys, including many anthomyiids.

This is the first Canadian record of *C. tigrina* as a predator of the adult of the onion maggot.

\*Proc. Ent. Soc. London 6, 1931, pp 13-15.