

Laphygma frugiperda S. & A. and Mocis repanda F. in Suriname

by

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(Concluded)

II. Mocis repanda F.

Introduction

The caterpillars of this moth have been noticed severely injuring rice and pasture grasses. Sometimes they occur simultaneously with the caterpillars of *L. frugiperda*. The newly hatched larvae start feeding on the upper or lower surface of the leaf, eating the tissue in long narrow strips, while only one membranaceous epidermis remains like a whitish transparent film. It is difficult to distinguish between the type of injury of *L. frugiperda* and of *M. repanda*. All moth stages are present during the whole year.

Description of the stages

Egg. Spherical, somewhat flattened at the base; diameter about 0.7 mm.

The shell shows a cell-like structure and is regularly divided by longitudinal ribs. Fig. 3 shows the central top part of the egg. Eight rather uniform cells are arranged around the micropyle. The egg colour of the new-laid egg is light green. Afterwards the colour becomes darker green, while several brown spots may be noticed.

Larvae. There are 7 instars. The table mentions the measured head widths in comparison with the theoretical ones according to DYAR's law.

Larval instar	Observed widths	Dyar's law (ratio 1.41)
1st instar	0.4 mm	(0.4 mm)
2nd "	0.6—0.7 "	0.6 "
3rd "	0.8—1.1 "	0.8 "
4th "	1.3—1.5 "	1.1 "
5th "	1.7—1.9 "	1.6 "
6th "	2.0—2.3 "	2.2 "
7th "	2.9—3.1 "	3.1 "

Larva 1. Light yellow-green as the body contents are visible through the hyaline cuticle. Length of the young larva 0.3—0.4 cm, of the fullgrown one 0.5—0.6 cm. Head yellowish light brown. One pair of legs on each of the abdominal segments 5, 6 and 10. Pronotum and dorsal part of abdominal segment 10 more chitinised than the other parts. Setae, often with a notched end, inserted on small brown-black chitinous plates (see fig. 4).

Larva 2. Length 0.7—1 cm; larva shows parallel red-brown lines extending backwards along the entire body length; dorsally one on either side of the median on the inner row of setae; laterally one on the lateral row of setae; between these two lines a third one can be noticed. Ventrally there are three parallel lines. Dorsally in the median a white yellow band runs along the length of the body.

Head capsule whitish yellow with four brown lines on either side of and paral-

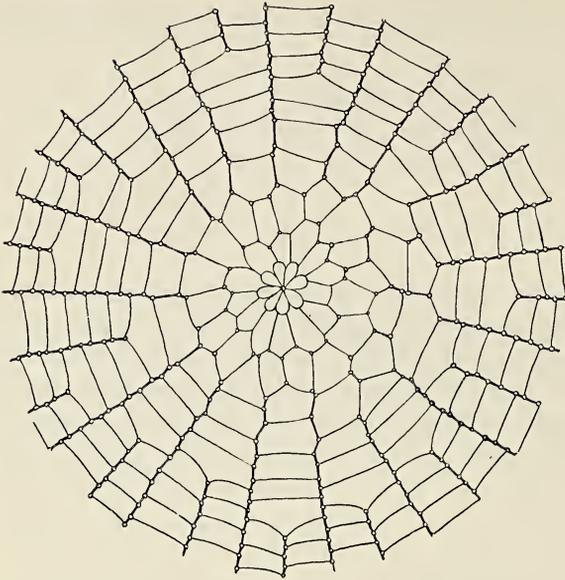


Fig. 3. Central top part of *M. repanda* egg.

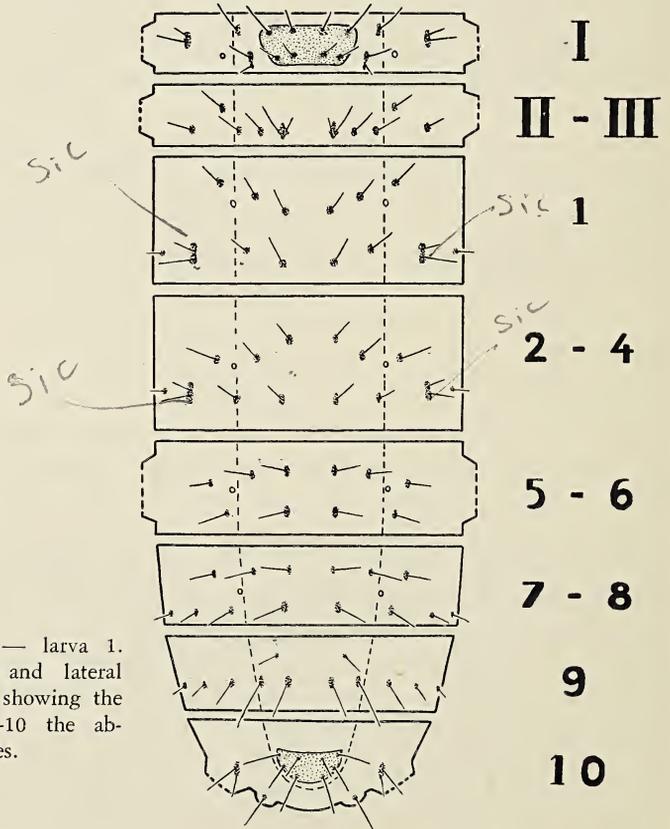


Fig. 4. *M. repanda* — larva 1. Setae map of dorsal and lateral body parts; I, II, III showing the thoracic segments, 1—10 the abdominal ones.

lel to the epicranial stem: the one nearest the median is bifurcated; the next one is also bifurcated but forms a loop as the two lines fuse again after a short distance. On the anterior part of the lateral third line four ommatidia are situated, grouped in a crescent; just beneath the latero-ventral fourth line, at its anterior part, a fifth ommatidium is situated, whereas the sixth ommatidium can be noticed near the base of the maxillary palp.

Larva 3. Length of young larva 1.1 cm; full grown 1.5 cm. For further description, see larva 4.

Larva 4. Length 1.5—2 cm. Head capsule bone-white. Eight dark or even black parallel lines at both sides of the epicranial stem. Several of these lines are each more or less distinctly separated into two fine lines lying very closely together.

The third and fourth line from the epicranial stem are bifurcated and form an elongated loop. The epicranial stem is often darkly bordered.

In the median, dorsally extending along the entire body, there is a whitish cream-coloured band, on both sides bordered by two parallel dark lines. These lines are the extensions of the two lines placed directly at both sides of the epicranial stem. The lateral body part is formed by lighter coloured band on which four parallel dark lines extending lengthwise may be vaguely distinguished. Ventrally at each side and parallel with the ventral-median four dark lines are situated closely together. The median is formed by a black line which broadens on the abdominal segments 3 and 4. The posterior and anterior borders of the abdominal segments 1—2 and 2—3, dorsally with a black pigmentation, form two characteristic transverse black band-like zones.

Larva 5. Length about 3 cm. Head capsule bone-white. Epicranial stem darkly bordered; on both sides eight black parallel lines. In the median a whitish cream coloured band is to be found, narrow on the pronotum, broadening on the abdomen and narrowing gradually again on the ninth segment.

In the middle of this band, extending lengthwise, there are two brown parallel lines. The band is bordered on each side by a brown-black band. The lateral body-part is creamy-yellow, with four brown fine lines extending lengthwise; the lower border is deep yellow.

For the ventral body part: see preceding instar.

Larva 6. Length 3.6—4 cm. Head capsule bone-white, epicranial suture darkly bordered; at both sides eight black parallel lines. Several of these lines are each more or less distinctly separated into two fine lines lying closely together. In the median, dorsally extending along the entire body, a whitish cream-coloured band is situated. In the middle of this band there are two sepia-coloured parallel lines, which bifurcate on the abdominal segments 1 to 6.

This median band is bordered at both sides by a grey brownish-black band, composed of about five longitudinal greyish brown lines. Dorsally, at the borders of the abdominal segments 1—2 and 2—3 an intensively black small transverse band is situated. The lateral body-part is yellow with about eight parallel longitudinal orange-brown lines; the lower margin of this lateral body zone is deep yellow.

Ventrally the body shows eight to nine parallel longitudinal brownish-black



Fig. 5. *M. repanda*-larvae 7. About natural size.

lines, so that the primary grey yellow body colour is only vaguely visible; on the median there is a dark line, bordered with whitish yellow.

Larva 7. Length 4—5.5 cm; see discription of larva 6 and fig. 5.

For each of the preceding larval stages a coulour description has been given of the most generally occurring caterpillar type. During breeding experiments with about one hundred larvae several colour variants could be distinguished, especially during later stages. There is a drab to sallow-coloured form; the whitish cream coloured dorsal-median band is bordered at both sides by a yellowish-brown band, composed of about five longitudinal brownish lines; the lateral body part is yellowish-white with about eight orange-brown lines; the longitudinal lines on the head capsule are light brown.

Sometimes the normal type may change into a dark form e.g. after the moulting from larva 5 to larva 6 or from 6 to 7. The arrangement of bands and lines as mentioned for the larval stages of the normal type may be only vaguely visible in this dark caterpillar type, as the dark greyish-black body colour masks these colour details. Dorso-laterally there often are greyish-white irregular spots.

Moths bred from caterpillars belonging to the several caterpillar types, however, could not be distinguished.

Pupa. Size variable; length 1.6—2.6 cm, width 0.5—0.6 cm. Brown, covered more or less by a bluish white film of wax.

Adult. Primary colour of body and wings greyish brown. Front wing somewhat triangular in shape. Length of anterior, lateral and posterior border 2, 1.3, and 1.5 cm respectively. The following pattern can be noticed: a brown cross

line at a distance of about 0.5 cm parallel with the lateral wing border. Another brown straighter cross line is situated at a distance of about 0.5 cm from the wing base. These lines divide the front wing into 3 zones. Lateral and posterior wing borders provided with a short fringe. On the lateral border a lighter coloured outer and a darker coloured inner fringe are present. The male can easily be distinguished from the female by the presence of long hairtufts on the hind legs.

Life history.

In our breeding experiments the eggs were deposited singly, or in masses of two to eight on the leaves and stems of the foodplants. In groups the eggs often touch each other. They hatch in four days. The long slender caterpillar gnaws a hole in the lateral part of the egg, quits the egg, devours the shell and soon starts feeding on the foodplant tissue. The caterpillar is a typical looper and moves by looping rather than by crawling. The first three larval stages feed upon the upper or lower surface of the leaves in such a way that only one epidermis remains. As the larvae gradually move backwards during feeding, long narrow strips appear, running parallel to the leaf veins; the length of these strips may vary from 1—8 mm, the width from 0.2—0.5 mm.

The larvae of the later stages devour irregular leaf parts. During a heavy caterpillar infestation the foodplant may be completely defoliated. For the duration of the respective larval stages the following data can be given: 3, 3, 2—3, 2—3, it drops onto the ground and spins a loose silken cocoon usually between leaves or other plant rubbish near the base of its foodplant. After resting for about two days, the larva transforms into a greenish-brown pupa, which after a short time changes its colour to brownish. As the pupal stage lasts 7—10 days, the time required for the life cycle from the egg to the moth stage varies between 30 and 37 days. During breeding experiments female moths started egg laying in about 10 days after emergence. This means that there will be eight generations annually.

Natural enemies

The wasps *Polistes canadensis* var. *panamensis* Holm. and *P. versicolor* Ol. prey intensively upon the caterpillars. Several of the *Polybia* spp. mentioned for *L. frugiperda* caterpillars are probably also enemies of *M. repanda*. Often the *M. repanda* caterpillar succeeds in escaping a wasp attack in dropping rapidly onto the ground. *Apanteles marginiventris* Cress. also parasitizes the larvae.

Verzoek om medewerking. Met het oog op een revisie van de palaeartische en Aziatisch-Australische soortgroepen van het bijengeslacht *Anthophora* Latr. (sensu lato), zou ik het op prijs stellen zoveel mogelijk materiaal te kunnen onderzoeken. Ook de in Nederland gevonden soorten komen bij het vaststellen van de subgenerieke kenmerken, het verspreidingsgebied en de variabiliteit der soorten, voor een revisie in aanmerking.

Wie voor dit doel zijn materiaal voor enige tijd wil afstaan, ontvangt dit binnen afzienbare tijd gedetermineerd terug; de bewerking van „kritische” soorten kan echter langere tijd in beslag nemen.

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