

MORPHOLOGY OF THE PUPAE OF THE JAPANESE LEPIDOPTERA (1)

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In the present report I intend to describe the pupae of following seven species :

Family Bombycidae

Oberthueria falcigera Butler

Family Geometridae

Agathia carissima Butler

Hipparchus dieckmanni Graeser

Ophthalmodes albosignaria Bremer
et Grey

Angerona nigrisparsa Butler

Family Noctuidae

Phytometra mandarina Freyer

Cucullia fraterna Butler

It seems to me that the pupae of these species have up to the present been almost unknown.

Before going further, I express my hearty thanks to Prof. K. Monzen for his constant guidance and Messrs. H. Sugawara and M. Hashimoto for their gifts of specimens.

Family Bombycidae

Oberthueria falcigera Butler

(Pl. II, Figs. 13 & 14)

The body ellipsoidal. The head, thorax, appendages and wings densely wrinkled. The abdomen coarsely punctured, sparsely scattered with minute setae. A line between the proximal end of the antenna and the pretentrina represented by a impressed line at the cephalic half of the line. The labrum not adjacent to the maxillae. The antennae extending to the distal end of the maxillae. The glazed eye-pieces distinct, touching the antennae and the prothoracic legs. The

maxillae extending about two-fifths the distance from their proximal end to the caudal margin of the mesothoracic wings. The labium concealed. The thoracic spiracles indistinct. The prothoracic and mesothoracic legs as well as the mesothoracic wings on both sides meeting respectively with each other on the meson posterior to the maxillae. The mesothoracic wings not extending to the caudal margin of the 4th abdominal segment. The distal end of the metathoracic legs visible between the distal ends of the mesothoracic wings. The metathoracic wings visible along the dorsal margin of the mesothoracic wings, extending to the level of the spiracles of the 4th abdominal segment. The caudal margin of the 4th~6th abdominal segments elevated on the dorsal area. The abdominal spiracles situated in the 2nd~8th segment; those of the 2nd and 3rd adjacent to the metathoracic wings; those of the 8th degenerate. The caudal end of the body scattered with many spines. Length 18mm., width 6.5 mm.

The colour of the living pupa dark purplish brown, tinged with black on the dorsal surface.

The pupa in a cocoon which is spun on twigs or leaves. The cocoon ellipsoidal, rather flat. Length 23 mm., width 14 mm. The colour dark brown.

I examined one male and one female pupae which were bred by me at Morioka, Iwate Pref., Honshu.

Family Geometridae

Agathia carissima Butler

(Pl. I, Figs. 1 & 2; Pl. II, Fig. 15)

The body fusiform, with the blunt cephalic end. The head, thorax, appendages and wings finely wrinkled. The cephalic part of the 5th~7th abdominal segments coarsely punctured. A line between the proximal end of the antenna and the pretentrina represented by a short impressed line at the cephalic part of the line. The labrum not adjacent to the maxillae. The antennae extending to the caudal margin of the mesothoracic wings. The glazed eye-pieces indistinct; their inner margin adjacent to the antennae and the prothoracic legs. The maxillae extending near the caudal margin of the mesothoracic wings. The labium visible between the labrum and the maxillae, forming a pentagon in outline. The thoracic spiracles normal. The prothoracic legs extending about two-thirds the distance from the proximal end of the maxillae to the caudal margin of the mesothoracic wings. The mesothoracic legs extending near the distal end of the maxillae. The mesothoracic wings not extending to the caudal margin of the 4th abdominal segment. The distal end of the metathoracic legs visible between the distal ends of the antennae. The metathoracic wings visible along the dorsal margin of the mesothoracic wings, extending to the level of the spiracles of the 4th abdominal segment. The abdominal spiracles situated in the 2nd~8th segments; those of the 2nd and 3rd adjacent to the metathoracic wings; those of the 6th situated at the level markedly ventral to those of the other segments; those of the 8th degenerate. The cremaster furnished with four pairs of hooked setae. Length 15 mm., width 4 mm. The colour of the living pupa pale brown, tinged with green; the thorax and abdomen dotted with black.

The pupa in a pale yellowish brown cocoon

which is spun between leaves.

I examined one male and two female pupae which were bred by Mr. M. Hashimoto at Hizume, Iwate Pref., Honshu.

Hipparchus dieckmanni Graeser

(Pl. I, Figs. 3 & 4; Pl. III, Figs. 16)

The body fusiform, with the blunt cephalic end. The head, thorax, appendages and wings finely wrinkled. The abdomen scattered with minute granules. A line between the proximal end of the antenna and the pretentrina represented by a short impressed line at the cephalic part of the line. The labrum adjacent to the maxillae. The antennae extending to the caudal margin of the mesothoracic wings. The glazed eye-pieces indistinct; their inner margin adjacent to the antennae and the prothoracic legs. The maxillae extending slightly beyond the caudal margin of the mesothoracic wings. The labium visible between the maxillae, forming an obtuse triangle in outline. The thoracic spiracles distinct; their caudal margin slightly elevated. The prothoracic legs extending about five-sevenths the distance from the proximal end of the maxillae to the caudal margin of the mesothoracic wings. The mesothoracic legs extending near the distal end of the antennae. The mesothoracic wings not extending to the caudal margin of the 4th abdominal segment. The metathoracic legs concealed. The metathoracic wings visible along the dorsal margin of the mesothoracic wings, extending slightly beyond the level of the spiracles of the 4th abdominal segment. The abdominal spiracles situated in the 2nd~8th segments; those of the 6th situated at the level slightly ventral to those of the other segments; those of the 8th degenerate. The cremaster furnished with

four pairs of hooked setae. Length 19 mm., width 5.5 mm.

The colour of the living pupa pale green.

The pupa in a white cocoon which is spun between leaves.

I examined one female pupa which was collected by me at Morioka, Iwate Pref., Honshu.

Ophthalmodes albosignaria Bremer et Grey

(Pl. I, Figs. 7 & 8 ; Pl. III, Fig. 17)

The body fusiform, with the blunt cephalic end. Its surface rather polished. The head, thorax, appendages and wings finely wrinkled. The abdomen roughly punctured. A line between the proximal end of the antenna and the pretentrina represented by a impressed line. The labrum adjacent to the maxillae. The antennae extending near the distal end of the maxillae. The glazed eye-pieces distinct, touching the antennae and the prothoracic legs. The maxillae extending near the caudal margin of mesothoracic wings. The labium visible between the maxillae, forming a obtuse triangle in outline. The thoracic spiracles distinct; their caudal margin slightly elevated. The prothoracic legs extending about four-fifths the distance from the proximal end of the maxillae to the caudal margin of the mesothoracic wings. The mesothoracic legs extending to the distal end of the antennae. The mesothoracic wings not extending to the caudal margin of the 4th abdominal segment. The distal end of the metathoracic legs visible between the distal ends of the mesothoracic wings. The metathoracic wings visible along the dorsal margin of the mesothoracic wings, extending beyond the level of the spiracles of the 4th abdominal segment. The cephalic margin of the 5th~7th abdominal segments

forming a raised line. The abdominal spiracles situated in the 2nd~8th segments; those of the 2nd, 3rd and 4th adjacent to the metathoracic wings; those of the 8th degenerate. The cremaster spiniform, sharply bifurcate at the tip. Length 16 mm., width 6 mm.

The colour of the living pupa blackish brown.

The pupa in the ground.

I examined one male pupa which was bred by me at Morioka, Iwate Pref., Honshu.

Angerona nigrisparsa Butler

(Pl. I, Figs. 5 & 6 ; Pl. III, Fig. 18)

The body fusiform, with the blunt cephalic end, almost smooth and polished on the surface. The cephalic part of the 3rd~7th abdominal segments scattered with minute granules. A line between the proximal end of the antenna and the pretentrina represented by a short impressed line at the cephalic part of the line. The labrum adjacent to the maxillae. The antennae extending about one half the distance from the distal end of the maxillae to the caudal margin of the mesothoracic wings. The eyes uniformly polished; their inner margin adjacent to the antennae and the external angle of the proximal end of the maxillae. The maxillae extending about four-fifths the distance from their proximal end to the caudal margin of the mesothoracic wings. The labium visible between the maxillae, forming a obtuse triangle in outline. The thoracic spiracles distinct; their caudal margin markedly elevated. The prothoracic legs not extending to the distal end of the maxillae. The mesothoracic legs extending slightly beyond the distal end of the antennae. The mesothoracic wings not extending to the caudal margin of the

4th abdominal segment. The distal end of the metathoracic legs visible between the distal ends of the mesothoracic wings. The metathoracic wings visible along the dorsal margin of the mesothoracic wings, extending slightly beyond the level of the spiracles of the 4th abdominal segment. The abdominal spiracles situated in the 2nd ~8th segments; those of the 8th degenerate. The cremaster furnished with four pairs of hooked setae. Length 21 mm., width 6 mm.

The colour of the living pupa brown.

The pupa in a cocoon which is spun between leaves.

I examined one female pupa which was collected by me at Morioka, Iwate Pref., Honshu.

Family Noctuidae

Phytometra mandarina Freyer

(Pl. II, Figs. 9 & 10)

The body fusiform, with the blunt cephalic end. The front and prothorax marked with transverse impressed lines. On the dorsal surface, the metathorax and the first seven abdominal segments roughened with many granules. The remainder of the surface almost smooth. The tufts of minute setae situated on the position of the primary tubercles. The front provided with a pair of projections. A line between the proximal end of the antenna and pretentrina represented by a impressed line. The labrum adjacent to the maxillae. The antennae not extending to the distal end of the mesothoracic legs. The glazed eye-pieces distinct, touching the antennae and the maxillae. The maxillae extending near the caudal margin of the mesothoracic wings. The labium and labial palpi visible between the maxillae, extending about one-fifth the length of the maxillae.

The thoracic spiracles normal. The prothoracic legs extending about one half the distance from the proximal end of the maxillae to the caudal margin of the mesothoracic wings; the coxa exposed between the tarsus and the maxilla. The mesothoracic legs not extending the distal end of the maxillae. The mesothoracic wings not extending to the caudal margin of the 4th abdominal segment. The distal end of the metathoracic legs visible between the distal ends of the mesothoracic wings. The metathoracic wings visible along the dorsal margin of the mesothoracic wings, extending slightly beyond the caudal margin of the third abdominal segment. On the dorsal surface, the caudal margin of the first six abdominal segments forming a raised line. On the 5th and 6th abdominal segments, the scars of the larvapods markedly elevated. The abdominal spiracles situated in the 2nd ~8th segments; those of the 2nd and 3rd adjacent to the metathoracic wings; those of the 8th degenerate. The cremaster furnished with many spines. Length 16 mm., width 4.5 mm.

The colour of the living pupa brown, tinged with black on the dorsal surface.

I examined two male and one female pupae which were bred by Mr. H. Sugawara at Morioka, Iwate Pref., Honshu.

Cucullia fraterna Butler

(Pl. II, Figs. 11 & 12)

The body fusiform, with the blunt cephalic end. Its surface almost smooth and polished. A line between the proximal end of antenna and the pretentrina represented by a impressed line. The labrum adjacent to the maxillae. The antennae not extending to the distal end of the mesothoracic legs. The eyes uniformly polished; their inner margin adjacent to the

antennae and the maxillae. The maxillae extending the distal end of the mesothoracic wings, then turning back along the projecting portion of the mesothoracic wings. The labium and labial palpi visible between the maxillae, extending about one-fifth the length of the maxillae. The thoracic spiracles normal. The prothoracic legs extending about three-fifths the distance from the proximal end of the maxillae to the distal end of the mesothoracic wings; the coxa exposed between the tarsus and the maxilla. The mesothoracic legs not extending the distal end of the mesothoracic wings. The distal end of the mesothoracic wings markedly projected, not extending the caudal margin of the 5th

abdominal segment. The metathoracic legs concealed. The metathoracic wings visible along the dorsal margin of the mesothoracic wings, extending slightly beyond the caudal margin of the 3rd abdominal segment. The abdominal spiracles situated in the 2nd ~8th segments; those of the 2nd and 3rd adjacent to the metathoracic wings; those of the 8th degenerate. The cremaster furnished with no spines. Length 20~23 mm., width 7~7.5 mm.

The colour of the living pupa brown.

The pupa in the ground.

I examined three male and two female pupae which were bred by me at Morioka, Iwate Pref., Honshu.

Explanation of Plates

Plate I (Pupa \times 3)

1. *Agathia carissima* Butler, male (ventral view).
2. Ditto (lateral view).
3. *Hipparchus dieckmanni* Graeser, female (ventral view).
4. Ditto (lateral view).
5. *Angerona nigrisparsa* Butler, female (ventral view).
6. Ditto (lateral view).
7. *Ophthalmodes albosignaria* Bremer et Grey, male (ventral view).
8. Ditto (lateral view).

Plate II (Pupa \times 3)

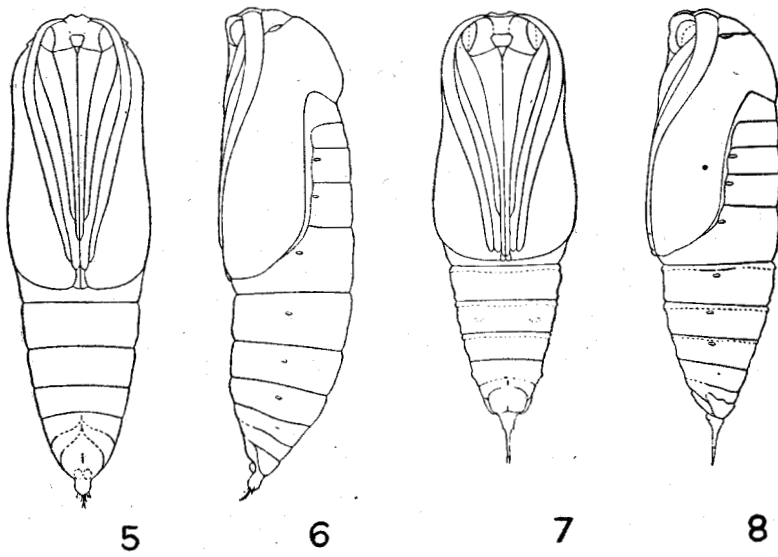
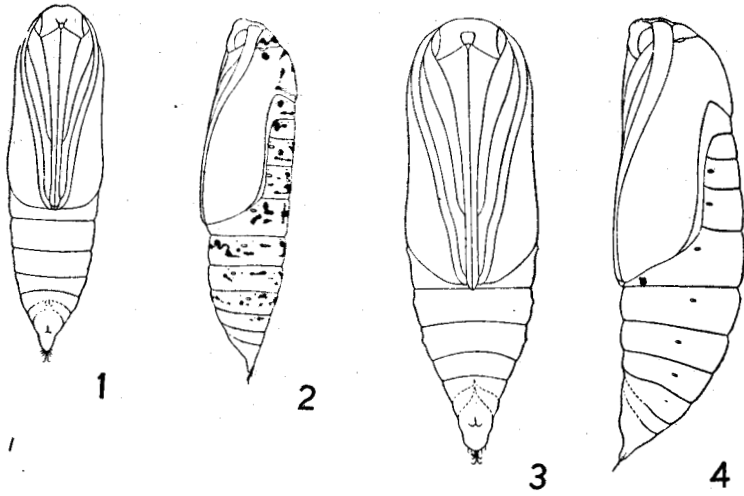
9. *Phytometra mandarina* Freyer, female

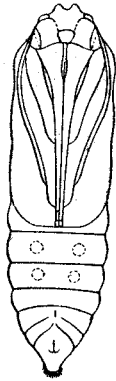
(ventral view).

10. Ditto (lateral view).
11. *Cucullia fraterna* Butler, male (ventral view).
12. Ditto (lateral view).
13. *Oberthueria falcigera* Butler, male (ventral view).
14. Ditto (lateral view).

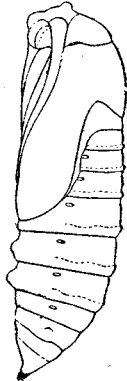
Plate III (Cremaster \times 30)

15. *Agathia carissima* Butler.
16. *Hipparchus dieckmanni* Graeser.
17. *Ophthalmodes albosignaria* Bremer et Grey.
18. *Angerona nigrisparsa* Butler.

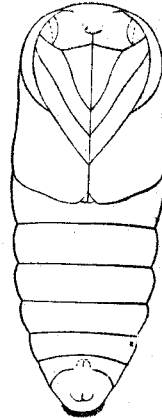




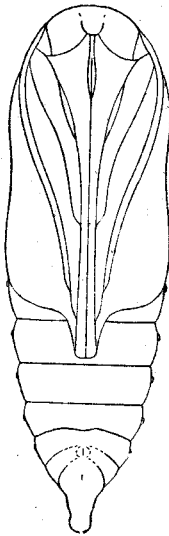
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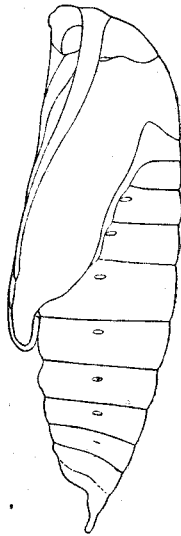
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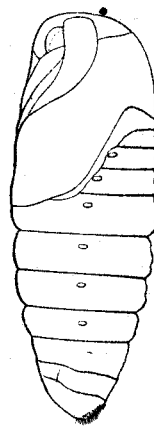
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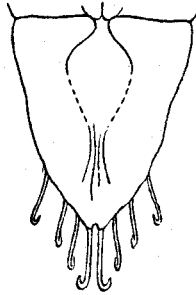
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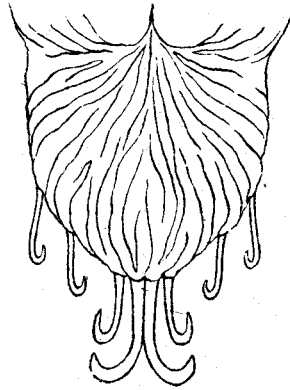
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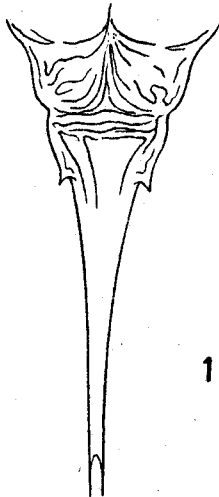
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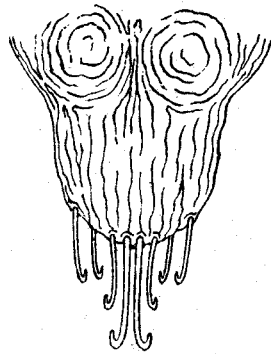
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