

**The early stages of *Thaumato-grapha eremnotorna* Diakonoff & Arita with remarks on the status of the Hilarographini (Lepidoptera Tortricioidea)**

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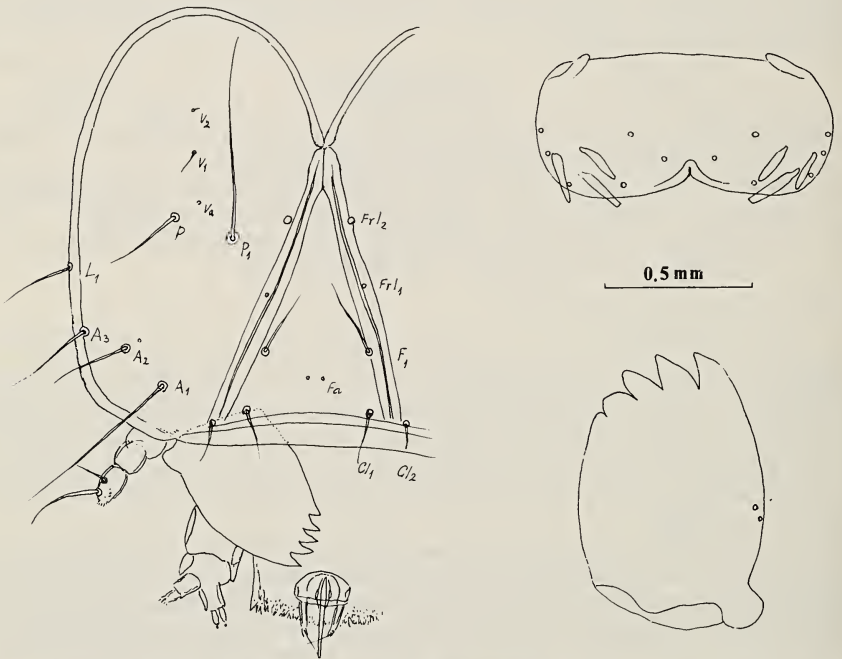
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**ABSTRACT.** — Description of the chaetotaxy of the mature larva and of the pupa of *Thaumato-grapha eremnotorna* Diakonoff & Arita, 1976, a borer in living cambium of *Pinus densiflora* Sieb. & Zucc., in Japan, belonging to the Hilarographini (Tortricidae). The immature stages of this tribe become known for the first time. Quite surprising is the presence of a bisetose L group of setae of the prothorax, a feature, so far unknown in the superfamily Tortricioidea.

The peculiar group of the Hilarographini, apparently belonging to the Tortricidae, but only recently (Diakonoff, 1977) transferred to this family from the complex, so called Glyphipterigidae auctorum (= Glyphipterygidae Meyrick, 1913), is represented by elegant, gaudily colored and marked tropical and subtropical species of the Old and the New World.



Figs. 1-3. Sketch of the head of mature larva of *Thaumato-grapha eremnotorna*. 1 (left), right half, in dorso-ventral aspect (A. D. del.); 2 (right, top), the same, labrum; 3 (right, bottom), the same, right mandible (Y. A. del.).

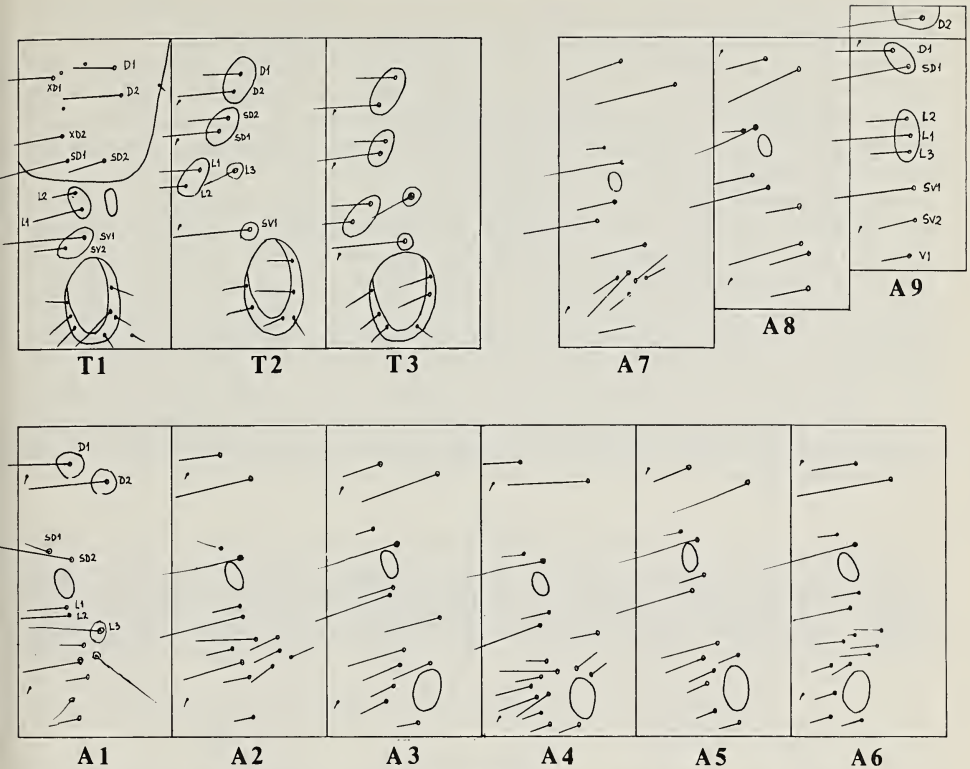


Fig. 4. Sketch of the chetotaxy of mature larva of *Thaumato-grapha eremnotorna* (Y. A. and A. D. del.).

Their early stages remained unknown, which made their systematic position somewhat uncertain. (Larvae of one species have been recorded from Java once, but never described).

Lately, the second author had the good luck of collecting larvae and pupae of *Thaumato-grapha eremnotorna* Diakonoff & Arita, 1976, a species belonging to this group, a borer in living cambium of a Coniferous tree (*Pinus densiflora* Von Siebold & Zuccerini), on Mt. Hira, Shiga Prefecture, Honshu, Japan, presenting us with the opportunity of studying important features of these immature stages. Several mounts of the material, now in possession of both authors, have been jointly made and drawn; they served for the following descriptions, figures and remarks.<sup>1)</sup>

#### THE MATURE LARVA

Length 7-8 mm. Colour bone-yellow, with a dark brown head capsule. Head prognathous. Ocelli lacking. Adfrontals reaching vertical triangle. Spinneret long and slender. Frontal seta one, F1. Fronto-lateral (adfrontal) setae 2. Clypeal setae 2, Cl1 and Cl2. Anterior setae, 3. Ocellar setae present, not visible in mount. Lateral seta L1 present. Posterior setae, 2, P2 rather approximated to P1. Vertical setae 2, V1 and V2, pore Vb lacking.

Body slender, with fine, not dense secondary setae; spiracula about equal in size, on

<sup>1)</sup> The costs of figs. 6 and 7 (by Mr. A. C. M. van Dijk, The Hague), have been covered by a grant of the Uytenboogaart-Eliassen Stichting, Amsterdam.

abdominal segments 1-6, slightly broader oval and larger on segments 8 and 9 slightly smaller. Pinnacula of the setae little sclerotised and therefore partly not easily discernible.

Prothorax with two prespiracular setae L1 and L2 on one pinnaculum, seta L3 absent, SV1 and SV2 on one pinnaculum, SV2 proterodorsal of SD1. Meso- and metathorax with D1 and D2 on one pinnaculum, D1 posterodorsal of D2; SD1 and SD2 on one pinnaculum, SD2 posterodorsal of SD1; L1 and L2 on one pinnaculum, L3 absent on mesothorax, on metathorax L3 on a separate small pinnaculum; SV group unisetose.

Abdominal segments with D1 closer together than D2 on segments 1-8, segment 9 with D1 on one pinnaculum with SD1, about equidistant from SD1 and SD2 on indistinct pinnacula (therefore these pinnacula not figured); abdominal segments with SD1 distinctly anterior to spiracle, SD2 posteroventral to SD1, slightly posterad of spiracle on segments 1-7, on segment 8 slightly anterad of spiracle; SV1 and SV2 on one pinnaculum upon segments 1-8, SV3 absent on segments 1, 2, 7, 8 and 9; furthermore the SV group is confusingly multisetose on segments 1-8: apparently on 1 with 5 bristles, on 2 with 7, on 3 with 5, on 4 with 9, on 5 with 5, on 6 with 7, on 7 with 5 and on segment 8 with 2 bristles. Segment 9 with L group trisetose, on one pinnaculum, SV1 and SV2 separate. Anal shield rounded posteriorly, anal fork absent. Prolegs rather short, crochets 13-14 in uniordinal circle on abdominal prolegs, anal prolegs with 6-7 crochets in an uniordinal semicircle.

#### PUPA

Length  $\pm$  5.5 mm, light brown-bone colour, spindle-shaped with rather abruptly narrowed abdomen. Haustellum short and thick, not reaching middle of antennae. Maxillary palpus traceable. Labial palpus shorter than haustellum. Antennae reaching halfway between tips of

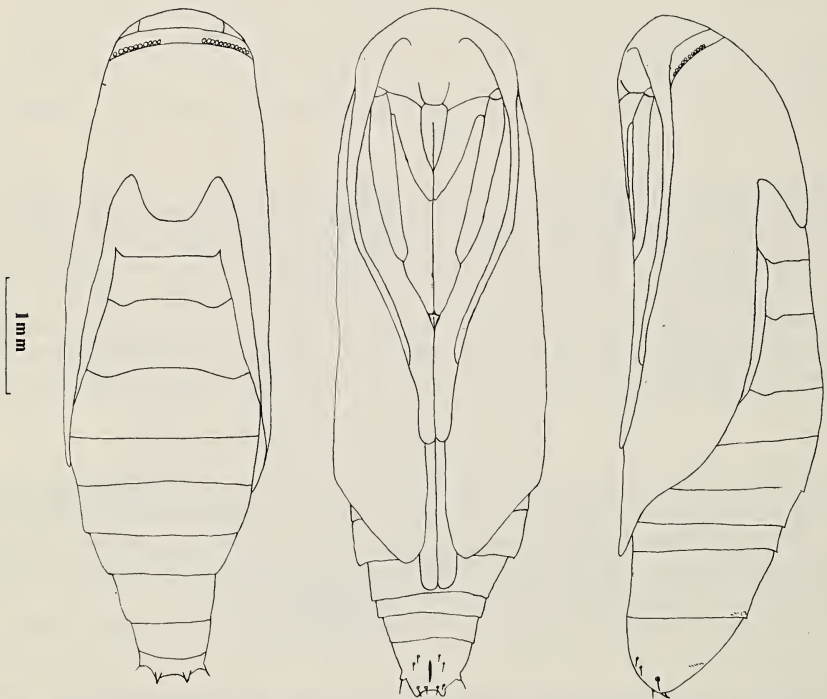
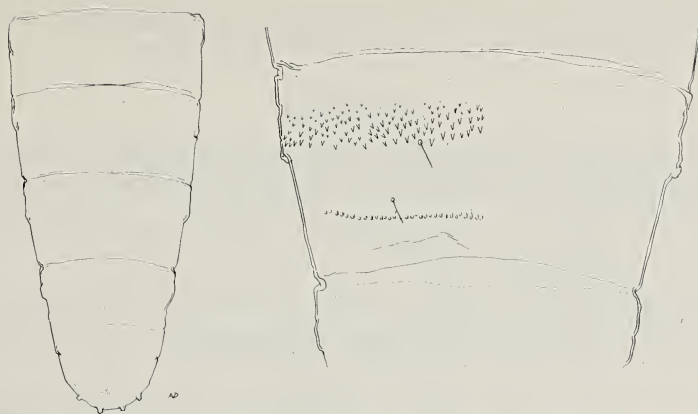


Fig. 5. Sketch of the pupa of *Thaumatogeta eremnotorna*, dorsal, ventral and lateral aspect (Y. A. del.).





Figs. 6-7. Abdomen of the pupa 6 (left), dorsal aspect; 7 (right), one tergite more magnified, showing two bands of spines (on the right side omitted). (A. C. M. van Dijk del.).

fore and mid legs and exceeding middle of wings. Hind legs exceeding tips of wings. Thorax with wing tips reaching posterior edge of sternite 4. Stigma on verge of meso- and metathorax darkly sclerotic and visible. Abdomen with rather ill-defined bands of small spines across tergites, each segment with a broader anterior submarginal band, formed of about 5-6 irregular rows of small posterad-directed spines, and a second narrow, sometimes partly interrupted posterior, supramarginal band, of a single row of spines. Cremaster consisting of four small warts, two lateral, two subapical, and on the ventral side, two groups of four small bristles.

#### REMARKS

As far as we know, all the representatives of the superfamily Tortricoidea possess three prestigmal setae of the L group upon the prothorax of the mature larva, without exception. (Mackay (1959) records incidental aberrant larvae with two and even one prestigmal bristle, sometimes different numbers right and left, which must be an anomaly). The absence of a third seta of this group in *Thaumato-grapha eremnotorna* is as unexpected, as it is striking. Several larvae studied did not vary in this respect. However, most other characteristics do not differ from those in true Tortricidae: setae L1 and L2 of the lateral group are on the same pinnaculum of the abdominal segments 1-8; seta SV3 is absent on the abdominal segments 1, 2, 7, 8 and 9, where this SV group is bisetose; seta D1 on segment 9 is equidistant to D2 and SD1 and not in a straight line with these. Also the crochets of the prolegs follow the tortricoid pattern, as well as the spiny bands on the abdomen of the pupa.

An important point that should be borne in mind, is that the studied larva is an internal feeder, a borer in tough, living plant tissue. The prognathous head and the absence of ocelli (stemmata) must be recent adaptations, as a consequence of these life habits. Whether the loss of the prespiracular seta L3 may be ascribed to the same factor, we do not know. Neither do we know still what the life habits and chaetotaxy of the larvae of other species of this characteristic group are, except that the undescribed larva of *Thaumato-grapha leucopyrga* Meyrick has been bred in Java in shoots of *Ardisia sieboldi* (Myrsinaceae), and so is also a borer in living plants. It will be interesting to study external feeders, free-living larvae of the present group, if these do exist.

To venture another surmise, the Hilarographini are closely related to the Polyorthini; both belong to the Chlidanotinae. Perhaps all species of this subfamily are bisetose. In that case their systematic position ought to be reconsidered, and eventually, the group be restored in the rank of a family, the Chlidanotidae, as Meyrick originally did (1913). Further discovery of bisetose larvae is not only conceivable, but seems to have been done already: Mr. John Dugdale of

Auckland, New Zealand, kindly wrote us, that he is rearing tortricoid larvae, possibly of the Chlidanotinae, which indeed have the L group of the prothorax bisetose!

## REFERENCES

- Diakonoff, A. & Y. Arita, 1976. New and old species of Glyphipterigidae and a new species of Acrolepiidae from Japan and the Far East (Lepidoptera). — *Zool. Meded. Leiden* 50: 179-219, 37 figs.
- Diakonoff, A., 1977. Description of Hilarographini, a new tribe in the Tortricidae (Lepidoptera). — *Ent. Ber., Amst.* 37: 76-77.
- Mackay, M. R., 1959. Larvae of the North American Olethreutidae (Lepidoptera). — *Can. Ent.* 91 (Suppl. 10): 1-138, 161 figs.
- Meyrick, E., 1913. Carposinidae, Heliodinidae, Glyphipterigidae. — *In Lep. Cat.* 13: 1-53.
- Dr. A. Diakonoff, Rijksmuseum van Natuurlijke Historie, Postbus 9517, 2300 RA Leiden.  
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 NIEUWE AANWINSTEN VOOR DE BIBLIOTHEEK

- ANOPHELES and malaria in the Near East, 1950 (H. S. Leeson a.o.; Mem. Lond. School Hyg. trop. Med. 7).
- ATYEO, W. T. & N. L. Braasch, 1966. The feather mite genus Proctophyllodes (Sarcoptiformes Proctophyllodidae) (Bull. Univ. Nebraska St. Mus. 5).
- BLAND, R. & H. E. Jaques, 1978. How to know the insects.
- CAPDEVILLE, P., 1979/80. Les races géographiques de Parnassius apollo, fasc. 4 & 5.
- COOPER, R., 1973. Butterflies of Rhodesia.
- DIRECTORY of North American entomologists and acarologists, 1979 (W. B. Hull & G. C. Odland, eds).
- ESTABLISHING efficacy of sex attractants and disruptants for insect control, 1979.
- FAUNE de Madagascar 51, 1979. H. Coiffait, Staphylinides, Oxytelidae, Osoriinae.
- KASTON, B. J., 1978. How to know the spiders, 3rd ed.
- KELLOG, V. L. & G. F. Ferris, 1915. The Anoplura and Mallophaga of North American mammals.
- MACGREGOR, M. E., 1927. Mosquito surveys. A handbook for anti-malarial and anti-mosquito field workers.
- MILLER, D., 1950. Catalogue of the Diptera of the New Zealand subregion. (Bull. Dept. sc. ind. Res., N. Z. 100).
- OBRAZTSOV, N. S., 1966. Die palaearktischen Amata-Arten (Lepidoptera, Ctenuchidae) (Veröff. zool. St. Samml. München 10).
- PIOTROWSKI, F., 1963. Wszy (Anoplura) i ich rola epidemiologiczna.
- POINAR, G. O., jr., 1979. Nematodes for biological control of insects.
- POPOV, V. M., 1962. Ixodid ticks of western Siberia.

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 NIEUWE TIJDSCHRIFTEN

- Beiträge zur Naturkunde Niedersachsens*, Hannover, B.R.D., vanaf vol. 1, 1948 (niet helemaal compleet).
- Biocontrol news and information*, Farnham Royal, England, vanaf vol. 1, 1980.
- Biologičeskii Žurnal Armenii*, Erevan, USSR, vanaf vol. 18, 1975.
- Bulletin of the association for Mexican cave studies*, Austin, U.S.A., vanaf vol. 2, 1968.
- Bulletin of the Kitakyushu museum of natural history*, Kitakyushu, Japan, vanaf vol. 1, 1979.
- Novitates arthropodae*, Crete, U.S.A., vanaf vol. 1, 1979.