A NEW EGG-PARASITE
OF GIPSY MOTH *LYMANTRIA DISPAR* (L.)

BY

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Different species of the genus *Hadronotus* FOERST. (*Hym. Scelionidae, Scelioninae*) are well known as economically important egg-parasites of various bugs (*Heteroptera*) and butterflies (*Lepidoptera*). Some of them attack dangerous pests as e.g. *Lymantria dispar* (L.). From this host, the species *Hadronotus howardi* MOKR. et OGL. were bred in Crimea and neighbouring districts of U.S.S.R. MOKRZECKI (1981) quotes *Hadronotus howardi* MOKR. & OGL. to be an important parasite of gipsy moth in Crimea, infesting 75-85 % of gipsy moth's eggs. HOWARD & FISKE (1911) mention this species (at that time known as *Telenomus* sp.) as one to be introduced in U.S.A. against gipsy moth. MEYER (1929) quotes this parasite in his list of parasites, bred from dangerous insects in Russia. From *Lymantria dispar* (L.) also a Telenomine — *Telenomus phalaenarum* NEES — was reared (THOMPSON, 1946).

By courtesy of my friend ing. Mr. ČAPEK (Research Institute of Forest Economy, Banská Štiavnica), I have obtained material consisting of 5 females of a new *Hadronotus* — species, reared from eggs of *Lymantria dispar* (L.) in East-Slovakia. This is already the third known Scelionide, parasiting in eggs of gipsy moth. Owing to the fact that only the above mentioned 5 females were obtained from several thousand of gipsy moth-eggs, it seems this species will be rather rare. Nevertheless, it could be perhaps possible — at least for the future — to introduce this species in the biological fighting against such dangerous pest as *Lymantria dispar* (L.).

Hadronotus lymantriae n.sp.

FEMALE. — Black, somewhat shining. All three pairs of legs reddishyellow, excepting coxae. Radicula black, scapus red, in the distal part somewhat darker. Flagellum dark-brown to black; pedicellus somewhat paler. Mandibels dark red. Wings quite hyaline, without any darkness.

Head nearly semi-globular in shape, wider than long (16:8), regularly and finely coriaceous (colour of grey steel), shining, covered with minute hairs. Cheeks finely striated. Frons beneath the antennal insertion with a shallow impression; its margin not sharply carinated. Mandibels with two strong teeth. Ocelli situated in a low triangle; the lateral ocell distant from the eye-margin by the length of its own diameter and very far from the central one. Eyes bare. Vertex without carina, rounded, not elevated; occiput margined by a crenulated semi-circular line posteriorly.

Hadronotus lymantriae n. sp.

Scapus oblong (7:1), pedicellus slightly oblong (2.5:1), thicker posteriorly, the 3rd joint inconspicuously oblong (1.5:1), 4th joint cubic (1:1), 5th slightly transverse (0.75:1), 6th still shorter (0.70:1). Six following joints forming an indistinctly separated club. The 7th and 8th joint rather short and distinctly transverse; 9th-11th joint nearly cubic or slightly transverse; 12th joint oblong, pointed.

Thorax slightly gibbose above, mesoscutum as wide as head (16:16), wider than long (16:8), shining, with the same sculpture as on the head, i.e. regularly and finely coriaceous. Scutellum large, broadly

rounded, covering metanotum as well as propodeum. Its sculpture corresponds with that of the head and mesoscutum.

Wings hyaline, exceeding abdomen. Fore-wings quite veinless, only an inconspicuous short trace of subcosta slightly visible at the base. Hind-margin toward apex with rather long, dark fringe-hairs, closely attached to the wing-margin, forming here a very narrow dark stripe. Hind-wing with conspicuous subcostal vein, reaching the fore-margin beyond the basal half of the wing's length. Three frenal hooks present. Hind-margin with rather long erected whitish fringe-hairs.

Legs slender and rather thin (see fig. 1).

Abdomen robust, oval, somewhat wider than long (18:16). First tergite strongly transverse, with longitudinal keels, second tergite the largest, roughly net-like sculptured, nearly without striation at the base; its posterior part with somewhat finer net-like sculpture. Third tergite with fine net-like sculpture gradually inconspicuous posteriorly. Fourth tergite shows the same sculpture as the third. Apex of abdomen with two pairs of unequally long bristles; the inner ones being shorter, the exterior very long.

Length. — 1.169 mm

Holotype. — 1 ♀, Cat. No. 3106 — deposited in collections of the Entomological Department of the National Museum of Praha (coll. L. MASNER).

Paratypes. — 3 ♀♀, deposited along with the holotype

1 ♀, deposited in collections of Commonwealth Institute of Entomology (British Museum), London.

MALE. — Unknown.

HOST. — *Lymantria dispar* (L.) — eggs.

BIONOMY. — Solitary entoparasite.

LOCALITY. — Beluja (Slov. merid.), 25. III. 1955, ing. Čapek lgt.

With respect to the general habitus, *H. lymantriae* n.sp. seems to be closely related to *H. howardi* MORK. et OGL., differing from it chiefly by having the wings fully veinless and eyes bare. Through the veinless wings it reminds *H. bernardi* MANEV. (parasite of eggs of *Mantis religiosa* L. in France) as well as Egyptian *Eremioscelio cydnoides* PRIESN. (bionomy unknown). These two species are distinguished from *H. lymantriae* n.sp. chiefly (apart from other characters) by having the vertex sharply carinated. It is necessary to notice that *H. bernardi* MANEV. represents a nomen nudum only; this species, however, was figured in GRASSÉ (1951, p. 968, fig. 897), but never described.

Hadronotus lymantriae n.sp. differs from all other *Hadronotus*-species by veinless, but simultaneously well developed wings.

The following key is destined for a quick determination of Scelio-nide egg-parasites, reared up to now from eggs of gipsy moth, *Lymantria dispar* (L.).

1. Abdomen aside with blunt lateral edge only; head smooth and polished. Female's antennae 11 jointed *Telenomus phalaenarum* NEES
- Abdomen aside with sharp lateral edge; head roughly sculptured. Female's antennae 12 jointed *Hadronotus*-species 2
2. Fore-wing with well developed veins /i.e. Sc, marginalis, radialis and postmarginalis. Eyes finely pilose *Hadronotus howardi* MOKR. et OGL.
- Fore-wing fully veinless, only a slight trace of Sc indicated on the base. Eyes bare *Hadronotus lymantriae* n. sp.

Phylogenetical position of *Hadronotus lymantriae* n.sp.

The species of *Hadronotus* FOERST. form a relatively polymorphous but yet monophyletic group. We can find among them both somewhat elongated and nearly rounded types. The same opinion has been suggested by OGLOBLIN (1931). Already KIEFFER (1917) divided *Hadronotus* FOERST. in two subgenera, namely *Hadronotus* s.str. and *Hadronotellus* KIEFF. This separation was based on differences shown mainly in palpi and two types of eyes — bare or pubescent. Some authors have taken up a sceptic standpoint towards this conception (e.g. MUESEBECK et WALKLEY 1951, 1956), considering both subgenera as synonyms. The author supposes — in conformity with MUESEBECK — that KIEFFER's subgenera can be hardly justified. *Hadronotus* s.str. and *Hadronotellus* KIEFF. — as they were originally proposed and delimited — do not represent phylogenetically homogeneous groups. The pilosity of eyes cannot be here successfully used as a subgeneric character, because there are various types of it with indistinct transitions. So e.g. in *H. howardi* MOKR. et OGL. the eyes are covered with minute hairs only, which can be easily overlooked. In some species we cannot seriously decide if the piles are present or if the whole eye is bare. On the other hand, such species as *H. laticeps* KIEFF. show a distinct hairy eyes. The different number of palpi, however, is an important characteristic, but, on the other hand, it can only with difficulty be used in determination. ASHMEAD's dates (1898) concerning the number of maxillary palpi of various nearctic species seem to be doubtful. In this respect the author agrees with OGLOBLIN (1931). Nevertheless, we can distinguish within *Hadronotus* FOERST. several natural groups of species ("Artengruppen" of German authors), forming among itself inconspicuous transitions. The first group would be represented by *H. laticeps* KIEFF. and related species, showing considerably rough and matt (dull) sculpture of body, the eyes distinctly pilose and vertex not carinated, i.e. passing over to occiput without any sharp edge. Another group (*H. bernardi* MANEV., etc.) contains types with silvery shade of shining (colour of

grey steel), bare eyes (or inconspicuously pilose) and rather short and transverse head, bearing a distinct sharp carina in vertexial region. Scutellum in these types is often remarkably developed, overlapping the narrow metanotum and, sometimes, propodeum, too. *Hadronotus lymantriae* n.sp. should be placed on the boundary between both mentioned groups of species. In shape of head, especially the rounded (not carinated) vertex, represents a typical character of species belonging to the first group. On the other hand, its sculpture as well as general habitus recalls rather the relations of the second group. *H. lymantriae* n.sp. proves again the impossibility to divide the genus *Hadronotus* FOERST. into independent subgenera (see also NIXON, 1934). The author is inclined to consider as acceptable to hold *Hadronotus* FOERST. as one comprehensive genus, without creating any lower categories in it.

From the phylogenetical point of view *H. lymantriae* n.sp. seems to be an important evolutionary type. It shows the inner progressive morphological tendencies of *Hadronotus* FOERST. A remarkable disappearing of venation may be observed in phylogenetically highly derivated species: *H. micropterus* KIEFF., *H. pedester* (KIEFF.). With this process the reduction of the wings — taken as a whole — is simultaneously progressing. The author was able to gather during several years a considerable number of *Hadronotus*-specimens (till now undescribed species) and to arrange a continuous line of species showing several degrees of wing-reduction. Simultaneously, the disappearing of veins was also observed. With respect to these facts, it seems that the species of the group with carinated vertex show a strong tendency both to the reduction of wings and the disappearing of wing-venation. This tendency is somewhat less distinct already with the group characterized by a rounded vertex. Nevertheless, such types, originating (arising) from both groups, represent the most derivated types in *Hadronotus* FOERST., and show the possible way of origin of some derivated genera of *Hadronotus*-complex. In this connection two such genera, namely *Encyrtoscelio* DODD and *Eremioscelio* PRIESNER should be mentioned. While *Encyrtoscelio* DODD is a wonderful and remarkable type, *Eremioscelio* PRIESNER seems (with respect to facts said above) to belong rather in *Hadronotus* FOERST., namely in its second group, characterized by short head and carinated vertex.

SUMMARY

Species of *Scelionidae*, parasiting in eggs of *Lymantria dispar* (L.) are mentioned and the results of use of these parasites are added. A new egg-parasite of gipsy moth — *Hadronotus lymantriae* n.sp. — is described. A key to *Scelionid* egg-parasites living in *Lymantria dispar* (L.) is given. Attention is drawn to the fact that *H. bernardi* MANEV. is a nomen nudum. Finally, the author discusses the phylogenetical and taxonomical internal relations in *Hadronotus* FOERST.

RÉSUMÉ

L'auteur mentionne les différentes espèces de Scélionides parasites des œufs de *Lymantria dispar* (L.) et rappelle les résultats obtenus par l'utilisation de ces parasites. Un nouveau parasite des œufs de ce Bombyx, *Hadronotus lymantriae* n. sp., est décrit. Il est montré en outre que *H. bernardi* MANEV. doit être considéré *nomen nudum*. Enfin l'auteur discute les relations phylogéniques et taxonomiques des espèces du genre *Hadronotus* FOERST.

REFERENCES

- ASHMEAD, W. H. — 1893. Monograph of the North-American *Proctotrypidae*. — *U.S. Nat. Mus. Bull.*, 45, 229-230.
- BERNARD, F. in GRASSÉ, P. P. — 1951. Traité de Zoologie, T. 10 (1), 968, fig. 897, Paris.
- DODD, A. P. — 1914. Further new Genera and Species of Australian Proctotrypoidea. — *Roy. Soc. Queensland Proc.*, 26, 119-120.
- FOERSTER, A. — 1856. Hymenopterologische Studien. v. 2, Aachen.
- GRASSÉ, P. P. — 1951. See BERNARD F.
- HOWARD, L. O. & W. F. FISKE. — 1911. The importation into the United States of the parasites of the gipsy moth and the browntail moth. — *U.S.D.A., Bur. Ent. B.*, 91, 1-312.
- KIEFFER, J. J. — 1926. *Scelionidae*. — *Das Tierreich*, 48 : 453, Berlin et Leipzig.
- KIEFFER, J. J. — 1917. Ueber neue und bekannte Microhymenopteren. — *Ent. Meddel.*, 11, 341-352.
- MEYER, N. F. — 1929. Schlupfwespen die in Russland in den Jahren 1891-1926 aus Schädlingen gezogen sind (Fortsetzung). — *Rep. of applied Entomology* V-o IV., Nr. 1, p. 240, Leningrad.
- MOKRZECKI, Z. & A. A. OGLOBLIN. — 1931. *Hadronotus howardi* n.sp. (Microhymenopt., Proctotrupidae). — *Polske Pismo Entomologiczne*, 10, 1-8.
- MUESEBECK, C. F. W. & L. M. WALKLEY. — 1951. *Hymenoptera of America north of Mexico*. — *U.S. Dept. Agric., Agric. Monograph*, 2, Washington.
- MUESEBECK, C. F. W. & L. M. WALKLEY. — 1956. Type species of the genera and subgenera of parasitic wasps comprising the superfamily Proctotrupoidea (Order Hymenoptera). — *U.S. Nat. Mus. Proc.*, Washington, 105, 319-419.
- NIXON, G. E. J. — 1934. The african species of *Hadronotus* (Hymenoptera, Proctotrupoidea, subfam. Scelioninae). — *Ann. Mag. N.H.*, 14, 299-313.
- PICARD, F. — 1924. Description d'un nouveau Proctotrypide du genre *Hadronotus* (Hym.). — *Bull. Soc. ent. France*, 107-109.
- THOMPSON, W. R. — 1946. A catalogue of the parasites and predators of insect pests. Sec. I. Parasite host catalogue. Part 8., Parasites of the *Lepidoptera*. — Belleville, 1946.
- WATANABE, CH. — 1951. On five Scelionid egg-parasites of some Pentatomid and Coreid bugs from Shikoku, Japan (Hymenoptera:Proctotrupoidea). — *Shikoku Ent. Soc. Trans.*, 2 : 17-26.

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