

Note on Lepidoptera from Bulgarian Caves

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The Lepidoptera, which are a typically phytophagous, epigeal group of insects, are represented in caves only as trogluxenes and subtroglophiles. However, they merit attention as essential components of the parietal association. In recent years Lepidoptera aggregations in caves have been studied only by Kowalski (1965, several species) and Graham (1968, 1968a, *Triphosa haesitata*).



Fig. 1. The Isker Valley in the Stara Planina Mts. — Lakatnik. Left limestone massif with openings of many visited caves. T — Temnata Dupka Cave.

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Unfortunately the niche of the Lepidoptera, in particular that of the Micro-Moths (Microlepidoptera), in the cavernicolous habitat is still little known in many European caves. Only the caves of Rumania are well known in this respect; from this country are listed 30 species of cave-inhabiting Lepidoptera (Capuse & Georgescu 1962-1963; Dumitrescu & colab. 1958, 1967; Georgescu 1962, 1964; Negrea & Negrea 1968); 16 species are reported from Bulgaria (Guéorguiev & Beron 1962), and about 70 in the World. But of this number some species occur more frequently and regularly in caves.

The material for this work was collected by the author, in great part, in some Bulgarian caves of the Lakatnik region in the Stara Planina Mountains (Fig. 1) during a botanical and zoological excursion organized in 1960 year by the Students' Association of Naturalists of the Jagiellonian University as well as during his stay here in the year 1970. At the time of my visit in Bulgaria of 4 specimens of Microlepidoptera taken by Mr. P. Beron in Bulgarian caves were given to me for determination by Mr. V. Guéorguiev from the Zoological Institut and Museum of the Bulgarian Academy of Sciences in Sofia. This material is included in this paper also.

EXAMINED MATERIAL AND LOCALITIES

Acrolepiidae

Digitivalva (= *Acrolepia*) *granitella* (Tr.)

Temnata Dupka Cave in Lakatnik 18 VIII 1960 3♂♂; 14-16 VIII 1970 24♂♂, 22♀♀ leg. author.

This species (?) was mentioned from caves in Bulgaria: by Tuleskov (1930) from the Baco Kiro Cave near Drjanovski Monastir in the Stara Planina Mts. and the Raziska Cave in Lakatnik 19 X 1939 2ex leg. B. Pittioni (Guéorguiev & Beron 1962).



Fig. 2. Imago of *D. pulicariae* (Klim.) (length of the fore wing - 6.5 mm)



Fig. 3. Imago of *D. granitella* (Tr.) (Length of the fore wing 7 mm).

Moreover, this species (?) has been recorded from caves in Algiers, South Europe to Belgium, South Germany and Rumania (Wolf 1934-1938 and others). But for a certainty it was found in caves of Switzerland (Strinati 1966) and Rumania (Negrea & Negrea 1968 and others).

D. pulicariae (Klim.)

Kozarskata Cave in Lakatnik 23 VII 1960 3♂♂, 1♀ leg. P. Beron; Temnata Dupka Cave 18 VIII 1960 9♂♂, 4♀♀; 14-16 VIII 1970 43♂♂, 36♀♀ leg. author.

It is a new element in the cave-fauna and fauna of Bulgaria. The species was mentioned as numerous in the caves of Rumania (Capuse & Georgescu 1962) and an artificial gallery in Belgium (Delhez & Houssa 1969).

The imago of *D. pulicariae* (Klim.) is rather similar in design and length of the wings to *D. granitella* (Tr.) (Fig. 2 and 3) but differs distinctly in the genital armature (Fig. 4 and 5)* According to Klimesch (1956) and Gaedike (1970, 1970a) who revised the European species of the genus *Acrolepia* Curtis; *D. pulicariae* (Klim.) is widely distributed from south, central and west Europe to Scandinavia, Germany and Czechoslovakia, as well as in Turkey. *D. granitella* (Tr.) has a narrow range limited to Central Europe (Fig. 6). These species were not recognized as distinct in 1956 (Klimesch 1956), consequently it is possible, that previous cave records of *D. granitella* (Tr.) apply to *D. pulicariae* (Klim.) or to other species of this group. This problem is one of the most interesting problems for further study.

I found only one locality in which both species occurred together. I have looked in many shorter and longer caves in the Isker Valley near Lakatnik (Fig. 1) but in all of them found only *Triphosa sabaudiata* Dup. They formed great homotypical compact aggregations by day and partly at night, a large number of them in copula.

* For detailed description see Klimesch (1956) and Gaedike (1970, 1970a). In key of Gaedike (1970a) fig. 6 on color plate shown is *D. granitella* (Tr.) and not *D. perlepidella* (Stain.) as was erroneously given before.

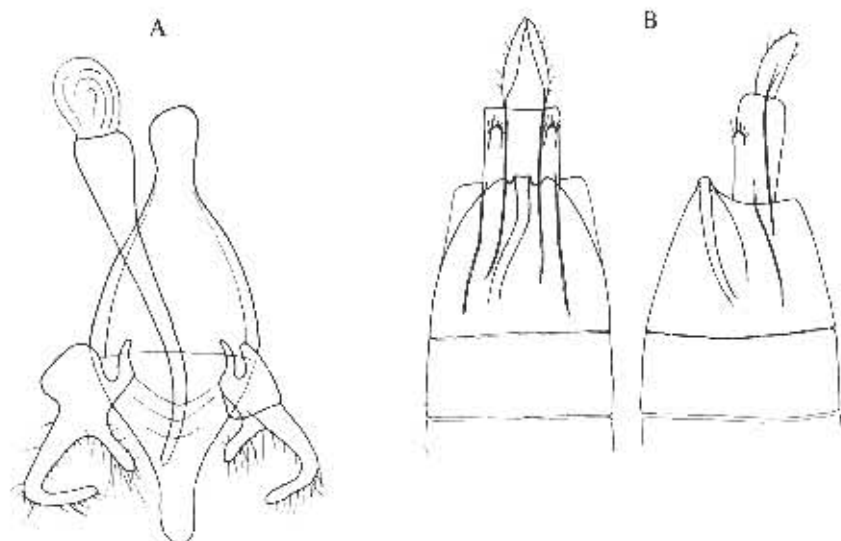


Fig. 4. Genital armatures of *D. pulicariae* (Klim.)

A – male
B – female

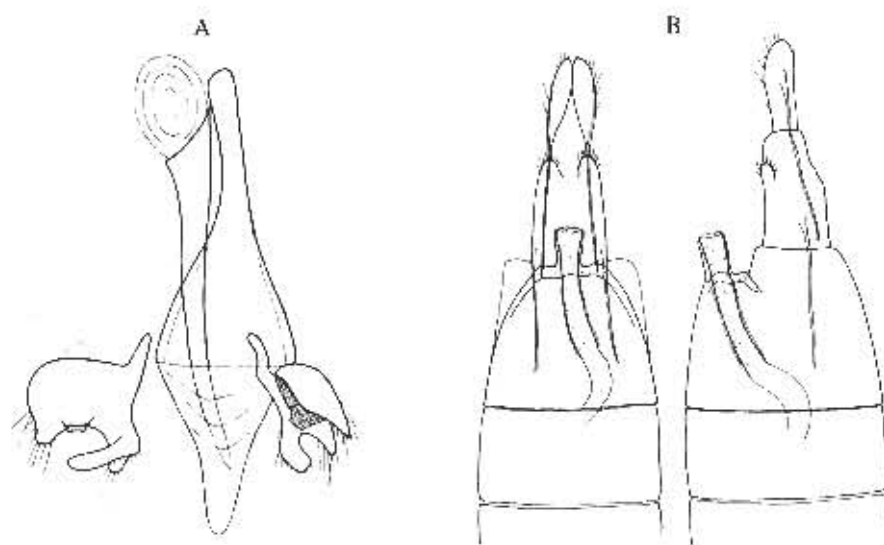


Fig. 5. Genital armatures of *D. granitella* (Tr.)

A – male
B – female

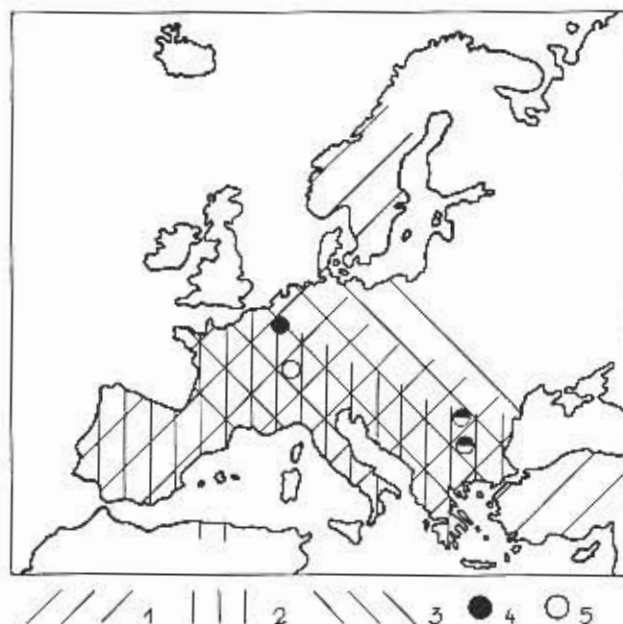


Fig. 6. Distribution of *D. pulicariae* (Klim.) and *D. granitella* (Tr.).

- 1 – distribution of *D. pulicariae* (Klim.)
- 2 – area of cave records of *D. granitella* (Tr.) (?) according to old literature
- 3 – distribution of *D. granitella* (Tr.)
- 4 – cave localities of *D. pulicariae* (Klim.) lately revised
- 5 – cave localities of *D. granitella* (Tr.) lately revised

In the Temnata Dupka Cave (Fig. 7) *D. pulicariae* (Klim.) and *D. granitella* (Tr.) were observed in some communities with numerous individuals sitting in small niches and cavities up to 150 m from the entrance in damper places forming "Digitivalva zones" (Fig. 8). Along with these Microlepidoptera I found as singletons specimens of *Micropterna nycterobia* Mc. L., *Limonia nubeculosa* (Meig.), *Culex* sp. and various *Diptera*. Great numbers of individuals, were also observed at night. The communities appeared to be heterotypical (bitypical), loose, only partly compact, aggregations with *D. pulicariae* (Klim.) dominant about 2:1 in relation to second species. It is a very interesting fact that in the Banat Cave in Rumania similar results were obtained (Negrea & Negrea 1968) whereas in the caves of Oltenia only *D. pulicariae* (Klim.) was noted (Capuse & Georgescu 1962; Motas, Decou & Burghiele 1967). It was observed in Rumanian caves all year (2 generations, 1 hibernating). In this respect, perhaps, *D. pulicariae* (Klim.) along with *D. granitella* (Tr.) is one of the typical Microlepidoptera components of the parietal associations, at least in several caves of the Balkan peninsula. Thus the common Microlepidoptera of these caves include two species, not only *D. granitella* (Tr.), as biospeleologists have previously concluded in accordance with the older data (Vandel 1965). These

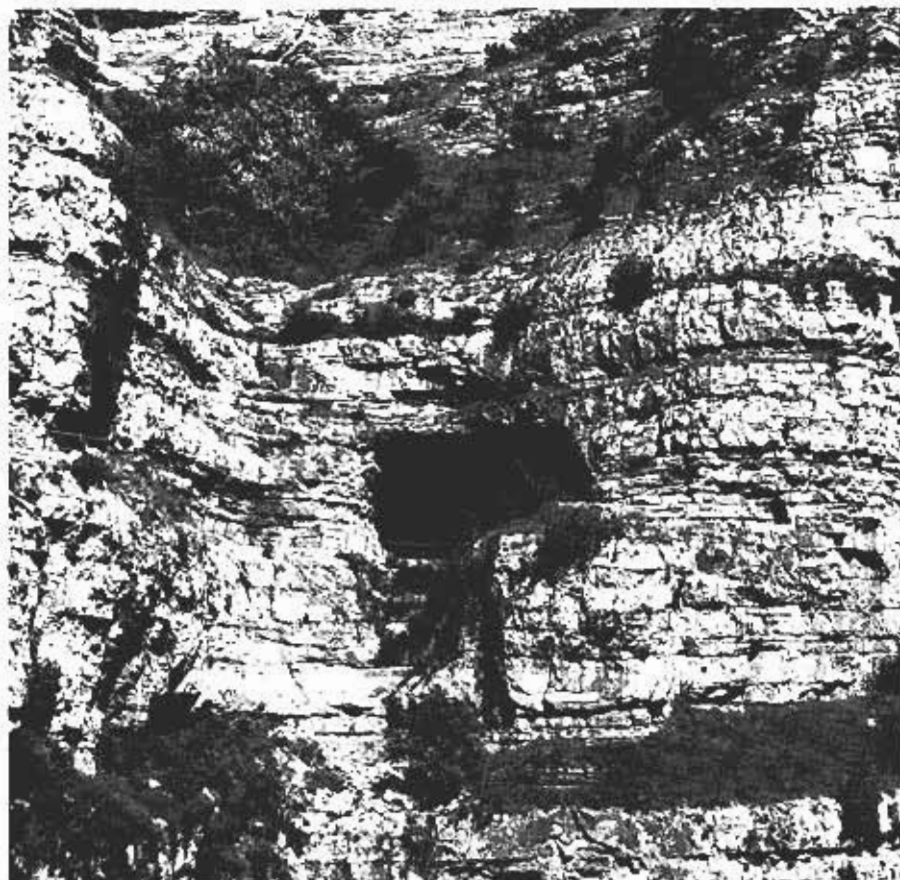


Fig. 7. Opening of the Temnata Dupka Cave.

species are phytophagous (leafmining in larval stage) and represent subtroglophile elements in parietal associations in summer and winter. In the Temnata Dupka Cave many specimens of the both species were transported by subterranean streamlets to the "troglobite zone" in the deeper part of the cave (Fig. 8), in which I observed, e.g., some blind isopods *Bureschia bulgarica* Verh.) sitting on walls.

Noctuidae

Autophila limbata Stgr.

Temnata Dupka Cave 18 VIII 1960 2♀♀, 19 VIII 1960 3♀♀, 14 VIII 1970 1♀;
Raziska Cave 19 VIII 1960 1♀ leg. author.

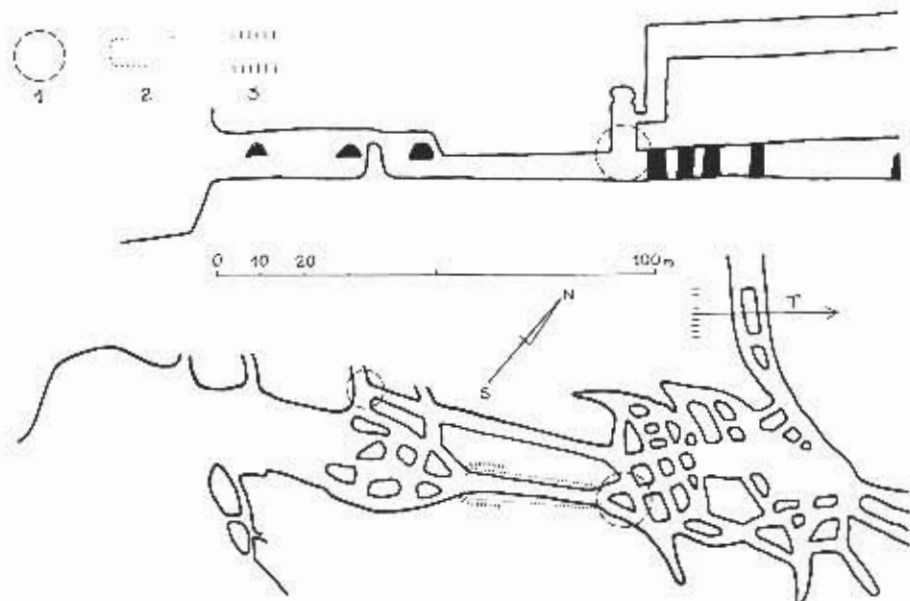


Fig. 8. Entrance parts of the Temnata Dupka Cave (according to Petrov, 1936).

- 1 - "Digitivalva zones"
- 2 - spacing of *T. sabaudiata* Dup.
- 3 - spacing of *A. limbata* Stgr.
- T - "troglobite zone"

Many specimens, but singletons were observed to about 10 m depth in the day only. A new element in cave-fauna and fauna of Bulgaria (Fig. 9).

Species mentioned from cave in Rumania; one female (Dumitrescu, Orghidan & Tanasachi 1958). Allied species *A. bang-hausi* Bour. was found in caves of Afghanistan (Lindberg 1963).

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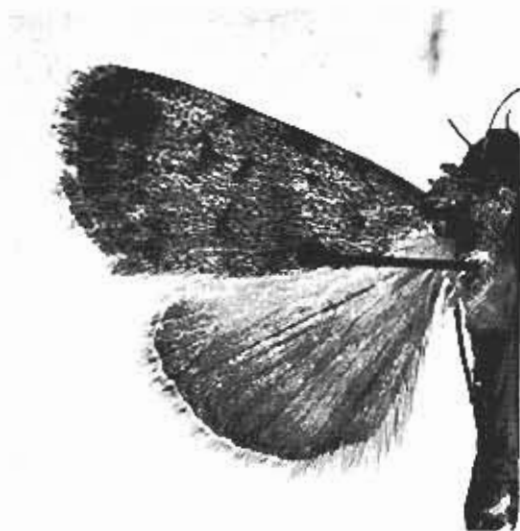


Fig. 9. Imago of *A. limbata* Stgr. (length of the fore wing – 16.5 mm).

SUMMARY

This paper is a report on Lepidoptera collected in 1960 and 1970 in some caves of the Lakatnik region in the Stara Planina Mts. (Bulgaria). The following species were found: *Digitivalva granitella* (Tr.), *D. pulicariae* (Klim.), *Triphosa sabaudiata* Dup. and *Autophila limbata* Stgr. Two species, *D. pulicariae* (Klim.) and *A. limbata* Stgr. are new for the cave-fauna and fauna of Bulgaria.

ZUSAMMENFASSUNG

Während des Jahres 1960 und 1970 wurden im Gebirge Stara Planina (Bulgarien) in einigen Höhlen bei Lakatnik Lepidoptera gesammelt. In der vorliegenden Arbeit werden die Resultate dieser Sammlungen dargelegt. In Höhlen wurden folgende Lepidopterenarten gefunden: *Digitivalva granitella* (Tr.), *D. pulicariae* (Klim.), *Triphosa sabaudiata* Dup. und *Autophila limbata* Stgr. Die zwei Arten *D. pulicariae* (Klim.) und *A. limbata* Stgr. sind für die Höhlenfauna Bulgariens und die Fauna Bulgariens neu.

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