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An introduction to the fauna of Ptiliidae (Coleoptera) of the Caucasian Reserve with a description of new species

Введение в фауну жуков-перокрылок (Coleoptera: Ptiliidae) Кавказского заповедника с описанием нового вида

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КЛЮЧЕВЫЕ СЛОВА: Coleoptera, Ptiliidae, *Ptiliolum nemtsovi, Acrotrichis*, новый вид, описание, фауна

ABSTRACT. This is the first investigation of the Ptiliidae's fauna of the Caucasian Reserve. The annotation list of 23 Ptiliidae species based on the author's collection is given. One species (*Ptiliolum nemtsovi* **sp.n.**) is described as a new and 5 ones (*Ptenidium ovulum, P. gressneri, P. brenskei, Acrotrichis soror, A. jelineki*) are recorded in the fauna of Russia for the first time. For rare and poor known species of genus *Acrotrichis* a new diagnostic characters are given.

РЕЗЮМЕ. Данная работа является первым исследованием фауны Ptiliidae Кавказского заповедника. В статье приведён аннотированный список 23 видов Ptiliidae, основанный на сборах авторов. Из них 1 вид (*Ptiliolum nemtsovi* **sp.n.**) описан как новый, а 5 видов (*Ptenidium ovulum, P. gressneri, P. brenskei, Acrotrichis soror, A. jelineki*) впервые указываются для фауны России. Для редких и мало изученных видов рода *Acrotrichis* приведены новые диагностические признаки.

Ptiliidae is one of the poorest known familia of beetles. Only European and North American fauna studied is quite completely, in comparison with other regions. In spite of this, "world" fauna contains more than 500 species. The Ptiliidae's fauna of Russia has been studied most poorly. Besides an outdated article of Motschulsky [1845] and Jacobson`s list [1910], there is only detailed work on the fauna of Moscow region [Polilov, 2003]. Some Transcaucasian species of Ptiliidae are noted in a number of articles [Motschulsky, 1845; Flach, 1889; Jacobson, 1910], but there aren't reliable findings of Ptiliidae from the Northern Caucasus. Thus, this is the first study of Ptiliidae of Caucasian Reserve and Russian part of the Caucasus.

The Caucasian Reserve is situated at the coordinates of 44–44.5° N and 40–41° E. The landscape is characterized by altitudes of 260–3360 meters above sea level. The basis of the reserve's relief is the Main Caucasian range, separating the territory to the Northern and Southern macroslopes. As for climatic conditions the territory of reserve belongs to damp western subregion of mountainous climatic region of the Caucasus [Alisov, 1956]. Collecting was being realized during three years (2000–2002) and it was taking place on the Northern and Southern macroslopes, near cordon Guzeripl (800 m above sl) located in the northern department; near cordon Umpyr (1050 m above sl) located in the southern department of reserve; and on the Southern macroslope — in Yew-box grove (50 m above sl) located apart from the main territory in Hosta. For collecting window-traps, placed on recently fallen wood of the main forest-formative species (*Abies nordmaniana, Fagus orientalis, Pinus kochiana, Betula litvinovii*); as well as sifting of forest litter were used. Total about 1600 specimens of *Ptiliidae* were collected and analyzed.

There are several methods of work with Ptiliidae [Johnson, 1982]. In Europe the "classical" method is most commonly used: beetles are analyzed in a dry state under stereoscopic microscope in reflected light. Another method is more popular among American specialists: they clarify beetles and make preparations on them, which are analyzed under microscope in passing light. The second method is technically more easy and has some other advantages. We combined both methods and analyzed specimens of some genera (*Nossidium, Ptenidium, Micridium*) in dry state, but clarified specimens of other genera in warm solution of alkali (KOH or NaOH) during 8–12 hours, than clean up in hydrogen peroxide and put into drops of Faure–Berlise medium on transpar-

ent celloidin plate, which we pinned down. With the help of this method we can look at preparations both in a reflected and in a passing light, having laid them down on an object-plate.

For determination of Ptiliidae species the following keys were used [Flach, 1989; Besuchet, 1971; Lohse & Lucht, 1989, Sundt, 1958; Mlynarski, 1984].

In the annotation list we gave widespread synonyms only. Sign "*" means species recorded in the fauna of Russia for the first time. In round brackets the place of safekeeping (cAP — collection of author, ZMUM — Zoological museum of Moscow University) is given.

Nossidium Erichson,1845

Nossidium pilosellum (Marsham, 1802)

MATERIAL. 1 ex., env. of village Guzeripl, forest litter under rotten beech stub, 13.3.2002, 1 ex., env. of village Guzeripl, plant remains, 30.3.2002 (cAP); 1 ex., Khosta, the Yew-box grove, 24.5.2002 (ZMUM).

DISTRIBUTION. Widespread in Europe, generally in southern regions; was found in wood and arboreal fungi [Besuchet, 1971].

Ptenidium Erichson, 1845

Ptenidium ovulum Flach, 1887*

MATERIAL. 1 ex., env. of village Guzeripl, window trap, 22.6–14.7.2000, 1 ex., same label, 31.7–19.8.2000 (cAP).

DISTRIBUTION. Mentioned only for Talysh (Azerbaijan) by Jacobson [1910]. Biology is unknown.

Ptenidium gressneri Erichson, 1945*

MATERIAL. 1 ex., env. of village Guzeripl, window trap, 22.6–14.7.2000, 1 ex., same label, 19.8–6.9.2000 (cAP).

DISTRIBUTION. Widespread in Europe, mentioned for Tbilisi [Jacobson, 1910] and Lenkoran [Besuchet, 1976]. In touchwood, sometimes in ant hills of *Lasius* and *Camponotus* [Besuchet, 1976]. Rare.

Ptenidium intermedium Wankowicz, 1869

MATERIAL. 1 ex., env. of village Guzeripl, window traps, 17.5–1.6.2000, 3 ex., same label, 1–22.6.2000, 13 ex., same label, 22.6–14.7.2000, 3 ex., same label, 26.6–10.7.2001 (ZMUM); 5 ex., same label, 14–31.7.2000, 141 ex., same label, 17.5.–8.6.2001, 93 ex., same label, 8–26.6.2001 (cAP).

DISTRIBUTION. Widespread in Europe up to Ural. Generally in humid forest litter in marshland.

Ptenidium brenskei Flach, 1887*

MATERIAL. 1 ex., env. of village Guzeripl, cordon Tretja Rota, beech, 19–29.5.2001, 1 ex., env. of village Guzeripl, window trap, 22.6–14.7.2000 (ZMUM); 57 ex., env. of village Guzeripl, window trap on a pine, 9–26.6.2001 (cAP).

DISTRIBUTION. Spread in central and southern Europe, was mentioned by Jacobson [1910] from Talysh (Azerbaijan). Lives on the river-banks [Besuchet, 1971].

Ptenidium fuscicorne Erichson, 1945

MATERIAL. 1 ex., env. of village Guzeripl, window trap, 22.6–14.7.2000 (ZMUM); 2 ex., env. of village Guzeripl, window trap on a fir, 17.5–8.6.2001 (cAP).

SYNONYM: *obscuricorne* (Motschulsky, 1845).

DISTRIBUTION. Widespread in Europe up to Ural. Generally in marshland.

Ptenidium formicetorum Kraatz, 1851

MATERIAL. 6 ex., env. of village Guzeripl, window trap, 22.6–14.7.2000 (cAP).

SYNONYM: *myrmecophilum* (Motschulsky, 1845), nec Allibert, 1844.

DISTRIBUTION. Spread in central and northern Europe, European part of CIS; was mentioned by Jacobson [1910] from Irkutsk Area. Generally in ant hills of *Formica rufa* and sometimes of *Lasius fuliginosus*.

Ptenidium pusillum (Gyllenhal, 1808)

MATERIAL. 10 ex., env. of village Guzeripl, window trap on a fir, 22.6–14.7.2000, 13 ex., env. of village Guzeripl, sawdust, 3.10.2002 (cAP); 3 ex., env. of village Guzeripl, window trap, 22.6–14.7.2000 (ZMUM).

DISTRIBUTION. Widespread in western Palaearctic. Generally in carrion hay and dung.

Micridium Motshulsky, 1868

Micridium vittatum (Motshulsky, 1845)

MATERIAL. 1 ex., env. of village Guzeripl, window trap on a pine, 26.6–10.7.2001 (cAP).

DISTRIBUTION. Spread in eastern and western Europe, mentioned for Caucasus and in Kharkov Area [Jacobson, 1910], Morocco [Besuchet 1971] and Moscow Area [Polilov, 2003]. Found under the bark and in touchwood, sometimes in ant hills of *Formica rufa*. Rare.

Ptilium Gyllenhal, 1827

Ptilium sp. indet.

MATERIAL. 1 ex., env. of village Guzeripl, window trap on a fir, 22.6–14.7.2000 (cAP).

REMARKS. There is a single female of genus *Ptilium* in our catches. This fact makes impossible exact definition.

Ptiliolum Flach, 1888

Ptiliolum nemtsevi **sp. n.**

MATERIAL. Holotype: ♀, Russia, Caucasian Reserve, env. of village Guzeripl, window trap on a fir, 8–26.6.2001 (ZMUM). Paratype: 2 ♀♀, Russia, Caucasian Reserve, env. of village Guzeripl, window traps, 14–31.7.2000 (ZMUM), 2 ♀♀, same label, 31.7–19.8.2000 (cAP).

DESCRIPTION. Body oval-lengthened. Total length 0.77–0.8 mm, width — 0.42 mm. Covers light-brown, upper side with a rough sculpture especially on pronotum, with contiguous short hairs.

Head distinctly doted, eyes well developed, each one consists of approximately 40 ommatidien. Antenne consist of 11 joints, 3–8 ones constricted basally and apically, last 3 joints considerably enlarged.

Width of pronotum 0.31 mm, length 0.19 mm, base wide, without constriction, sides roundly narrowed forward, the back edges rounded.

Elytrae oval-lengthened, rounded by apex, slightly narrowed after middle, covered abdomen entirely. Width of single elytra 0.21 mm, length 0.53 mm. Wings well developed.

Interval between metacoxa 5.5 × of width metathorax.

Abdomen with 6 visible sternits. Apex of terminal one with 7 denticles — large central and little bit less other.

Female. Spermateka big, with very thick tube (Fig. 1).

Male. Unknown.

DIAGNOSIS. Probably, belongs to subgenus *Ptiliolum* s. str., and by external characters more related to *P. spencei*. Horever, by structure of spermateca well distinguished from other species of genus.

ETYMOLOGY. The new species is honors by name of chief of Majkop scientific department of Caucasian Reserve, Nemtsev Alexander Stepanovich, who inspired others to scientific activity, perished in 2002 in airplane crash during flight around territory of reserve.

Ptinella Motshulsky, 1844

Ptinella limbata (Heer, 1841)

MATERIAL. 1 ex., env. of village Guzeripl, window trap, 19.8–6.9.2000 (cAP).

DISTRIBUTION. Spread in central and northern Europe and European part of CIS. Under bark and in touchwood.

Ptinella aptera (Guérin-Méneville, 1839)

MATERIAL. 4 ex., env. of village Guzeripl, window traps, 22.6–14.7.2000 (ZMUM); 1 ex., env. of village Guzeripl, window trap on a beech, 31.7–19.8.2000, 1 ex., env. of village Guzeripl, a pine, 30.6.2002 (cAP).

DISTRIBUTION. Widespread in western Palaearctic, mentioned for Kirghizia [Jacobson, 1910]. Under bark and in touchwood.

Ptinella tenella (Erichson, 1845)

MATERIAL. Env. of village Guzeripl, window trap on a fir, 22.6–14.7.2000. — 1 ex. (ZMUM); env. of village Guzeripl, window trap, 14–31.7.2000. — 3 ex. (cAP), 19.8–6.9.2000 — 4 ex. (ZMUM); env. of village Guzeripl, window trap on a fir, 8–26.6.2001. — 1 ex. (cAP).

DISTRIBUTION. Widespread in Europe and European part of CIS. Under bark and in touchwood.

Pteryx Matthews, 1858

Pteryx suturalis (Heer, 1841)

MATERIAL. 62 ex., env. of village Guzeripl, window trap on a fir, 22.6–14.7.2000, 1 ex., same label, 8–26.6.2001, 49 ex., env. of village Guzeripl, window traps, 22.6–14.7.2000, 19 ex., same label, 14–31.7.2000 (cAP); 13 ex., env. of village Guzeripl, window traps, 31.7–19.8.2000, 16 ex., same label, 19.8–6.9.2000, 3 ex., same label, 6–15.9.2000, 1 ex., env. of village Guzeripl, window trap on a beech, 31.7–19.8.2000, 1 ex., same label, 19.8–6.9.2000 (ZMUM).

DISTRIBUTION. Widespread in Europe up to Ural. Usually under bark and in touchwood; sometimes in tinder funguses, effluent juice and forest litter.

Acrotrichis Motschulsky, 1848

This genus contains about 200 described species, and majority of then is determined only by spermatekas. Mlinarski [1984] has marked out some new diagnostic features: chaetotaxy of 7-th (visible 6-th) sternite of male and labium of male and female. These attributes not only facilitate definition, but also enable to determine both female and male. Probably, in the future, they will be used not only for definition, but also for reconstruction of phylogeny of this genus. Up till now they were used for description of 17 Polish species [Mlynarski, 1984] and for description more than 10 Japanese ones only chaetotaxy of 7-th sternit was used [Sawada & Hirowatari, 2002]. Therefore we will use these attributes for description of several species.

Acrotrichis grandicollis (Mannherheim, 1844)

MATERIAL. 1 ex., env. of village Guzeripl, window trap, 9–26.6.2001 (cAP).

SYNONYMS: =*lata* (Motschulsky, 1845)

DISTRIBUTION. Spread in Holarctic. Generally in dung and carrion hay; less often in effluent juice and tinder funguses.

Acrotrichis montandoni (Allibert, 1844)

MATERIAL. 1 ex., env. of village Guzeripl, window traps, 14–31.7.2000, 1 ex., same label, 19.8–6.9.2000, 1 ex., env. of village Guzeripl, window trap on a beech, 29.4–8.6.2001 (ZMUM); 2 ex., env. of village Guzeripl, window trap on a fir, 8–26.6.2001 1 ex., env. of village Guzeripl, window trap on a pine, 9–26.6.2001 (ZMUM); 9 ex., env. of village Guzeripl, window trap on a fir, 17.5–8.6.2001, 1 ex., environs of cordon Umpyr, a stack, 28.5.2001 (cAP).

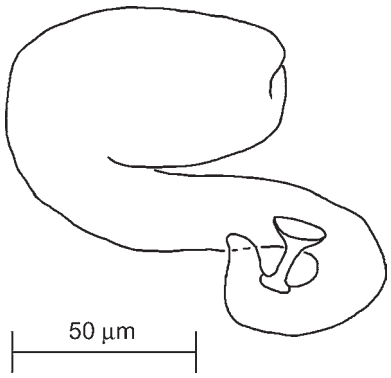

Fig. 1. *Ptiliolum nemtsovi* **sp. n.**, spermateka
Рис. 1. *Ptiliolum nemtsovi* **sp. n.**, сперматека

DISTRIBUTION. Spread in Holarctic. Generally in horse manure; less often in a litter, effluent juice, carrion hay and ant hills *Formica rufa*.

Acrotrichis dispar (Matthews, 1865)

MATERIAL. 9 ex., env. of village Guzeripl, window trap on a fir, 8–26.6.2001 (cAP).

DISTRIBUTION.Widelspread in Europe and European part of CIS. Generally in effluent juice, dung, compost and carrion hay.

Acrotrichis soror (Flach, 1989)*

MATERIAL. 1 ex., env. of village Guzeripl, window trap, 14–31.7.2001, 62 ex., env. of village Guzeripl, sawdust, 10.5.2002; 1 ex., environs of cordon Umpyr, in haystack, 28.5.2001 (cAP); 2 ex., env. of village Guzeripl, window trap on a beech, 19.4–8.6.2001, 1 ex., environs of cordon Umpyr, under the bark of a pine 28.5.2001, 4 ex., Khosta, the Yew-box grove, 24.5.2002 (ZMUM).

DISTRIBUTION. Mentioned only for Transcaucasian region [Flach, 1889]. Biology poorly known.

REMARKS. According to structure of spermateka this species belongs to '*fascicularis*'-group. From *A. matthewsii* easily distinguished by position of distal chords and structure of terminal loop of spermateca (Fig. 6), as well by characters of pronotal side-edgs [Johnson, 2001]. From *A. lucidula* differs by form of basical bend and absence of lengthened pretop bristles on mentum. Penis and 7-th sternite of a male similar with other species of this group (Fig. 9, 12).

Acrotrichis jelineki Johnson, 1981*

MATERIAL. 5 ex., env. of village Guzeripl, window traps, 17.5–1.6.2000, 5 ex., same label, 1–22.6.2000, 25 ex., 22.6–14.7.2000, 7 ex., same label, 31.7–19.8.2000, 3 ex., same label, 9–26.6.2001, 1 ex., env. of village Guzeripl, window traps on a fir, 1–22.6.2000, 24 ex., same label, 19.8–6.9.2001, 6 ex., same label, window trap on a beech 29.4–8.6.2001, 3 ex., same label, window trap on a pine, 9–26.6.2001, 2 ex., same label, 26.6–10.7.2001 (ZMUM); 94 ex., env. of village Guzeripl, window traps, 14–31.7.2000, 56 ex., same label, 19.8–15.9.2000, 157 ex., same label, 6–15.9.2000, 40 ex., same label, 22.6–14.7.2000, 82 ex., same label, 17.5–8.6.2001, 32 ex., same label, 8–26.6.2001, 97 ex., env. of village Guzeripl, window trap on a rotten beech, 16.9–14.10.2001, 1 ex., env. of cordon Umpyr, a stack, 28.5.2001 (cAP).

DISTRIBUTION. To present day only two specimens from Iran was known [Johnson, 1981]. Biology poorly known, probably, found in various carrion plant remains.

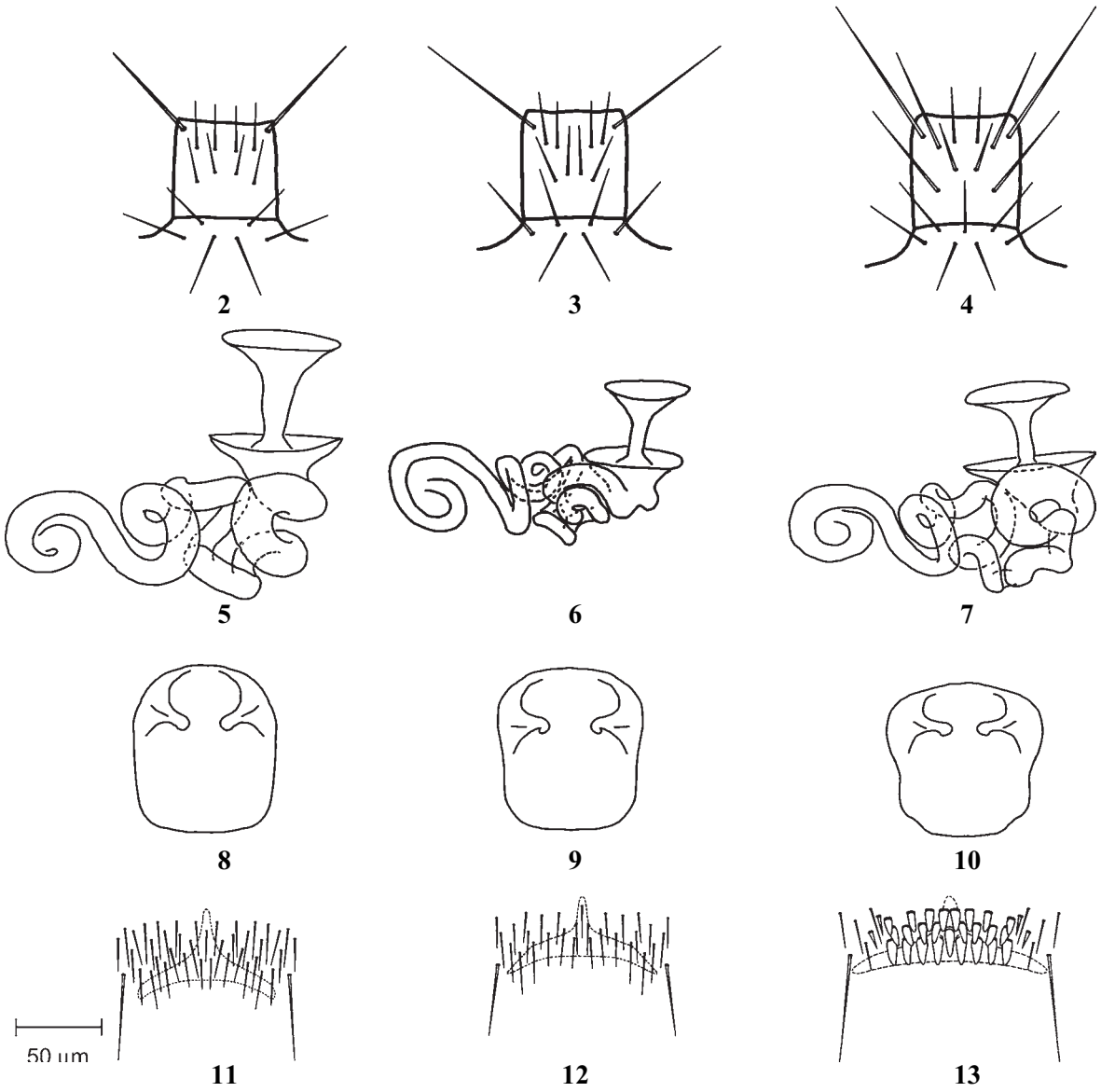

Fig. 2–13. Diagnostic characters of some species of genus *Acrotrichis*: 2, 5, 8, 11 — *A. jelineki*; 3, 6, 9, 12 — *A. soror*; 4, 7, 10, 13 — *A. rosskotheni*. 2–4 — labium, 5–7 — spermateka, 8–10 — penis, 11–13 — chaetotaxia of central part of 7-th sternite, ♂.

Рис. 2–13. Диагностические признаки некоторых видов рода *Acrotrichis*: 2, 5, 8, 11 — *A. jelineki*; 3, 6, 9, 12 — *A. soror*; 4, 7, 10, 13 — *A. rosskotheni*. 2–4 — нижняя губа, 5–7 — сперматека, 8–10 — пенис, 11–13 — хетотаксия центральной части 7-го стернита, ♂.

REMARKS. According to structure of spermateka *A. jelineki* belongs to '*intermedia*'-group (Fig. 5). From *A. intermedia* well distinguished by considerably smaller number of bristles on mentum and submentum (Fig. 2) and flat top of penis (Fig. 8). From *A. henrici* differing by form, sculpture, antenna coloration and more pale and thin spermateka [Johnson, 1981].

Acrotrichis rosskotheni Sundt, 1971

MATERIAL. 14 ex., env. of. village Guzeripl, window traps, 22.6–14.7.2000, 4 ex., same label, 31.7–19.8.2000 , 2 ex., same label, 6–15.9.2000, 7 ex., same label, 8–26.6.2001, 3 ex., same label, a window trap on a pine, 16.6–10.7.2001 (ZMUM); 1 ex., env. of. village Guzeripl, window traps, 1–22.6.2000, 5 ex., same label, 14–31.7.2000, 34 ex., same label, a window trap on a fir, 17.5–8.6.2001, 17 ex., same label, 1–22.6.2000, 19 ex., same label, 8–26.6.2001; 10 ex., same label, a window trap on a pine 9–26.6.2001 (cAP).

SYNONYM: =*fratena* Johnson, 1975.

DISTRIBUTION. Widel spread in Europe. Found in a litter. Rare.

REMARKS. According to structure of spermateka *A. rosskotheni* belongs to '*sitkaensis*'-group (Fig. 7) and more related to *A. sitkaensis*. However, easily distinuished by preapical narrowing of penis (Fig. 10) and 2 pairs of long bristles (not including the top bristles) on mentum (Fig. 4).

Acrotrichis atomaria (DeGeer,1774)

MATERIAL. 1 ex., env. of village Guzeripl, window trap, 6.9–15.9.2000 (cAP).

DISTRIBUTION. Widespread in Europe and European part of CIS. Generally in a litter and moss especially in damp

places; less often in bird's jacks, dung and ant hills.

Acrotrichis fascicularis (Herbst,1793)

MATERIAL. 1 ex., env. of cordon Umpyr, a stack, 28.5.2001 (cAP).

SYNONYM: = *atrata* (Motschulsky, 1845.

DISTRIBUTION. Widelspread in western Palaearctic, Northern America and New Zealand. Generally in a litter, dung and bird's nests.

Thus, in Caucasian Reserve 23 species from 8 genera of Ptiliidae was revealed. One species is a new to science and 5 are a new to fauna of Russia. The majority of a mentioned species (19) are widely spread in Europe and probably in Palaearctic. However, data about its distribution in Asian part of Palaearctic are practically absent. So, it's very difficult discuss the eastern border of their natural habitats. Two species (*P. ovulum* and *A. soror*) are found only in Caucasus and Transcaucasia, and Caucasian Reserve is the most northern point of its distribution area. For *A. jelineki* natural habitat is poorly investigated, and Caucasian Reserve is the most northern point of records.

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