Acarina 4(1–2): 35–38

PLEISTOCENE MITES (ACARIFORMES) FROM THE NARROW-SKULLED VOLE *MICROTUS GREGALIS EGOROVI* FEIGIN (RODENTIA, ARVICOLINAE)

ПЛЕЙСТОЦЕНОВЫЕ АКАРИФОРМНЫЕ КЛЕЩИ (ACARIFORMES) С УЗКОЧЕРЕПНОЙ ПОЛЕВКИ *MICROTUS GREGALIS EGOROVI* FEIGIN (RODENTIA, ARVICOLINAE)

H.V.Dubinina, A.V.Bochkov
Е.В. Дубинина, А.В. Бочков

Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia
Зоологический институт Российской Академии Наук, Санкт-Петербург, Россия

Key words: *Microtus gregalis egorovi, Myocoptes, Radfordia hylandi*
Ключевые слова: *Microtus gregalis egorovi, Myocoptes, Radfordia hylandi*

ABSTRACT

Ectoparasites were collected from 5 mummified specimens of the fossil narrow-skulled vole *Microtus gregalis egorovi* Feigin (Rodentia, Arvicolinae) from the Pleistocene of Yakutia. Acariform mites (Acariformes) found on these voles are represented by two species: *Myocoptes japonensis japonensis* Radford, 1955 (Listrophoroidea: Myocoptidae) and *Radfordia hylandi* Fain et Lukoschus, 1977 (Cheyletoidea: Myobiidae).

РЕЗЮМЕ

Собраны эктопаразиты с 5 мумифицированных трупов ископаемой узкочерепной полевки *Microtus gregalis egorovi* Feigin (Rodentia, Arvicolinae) из плейстоцена Якутии. Акариформные клещи (Acariformes), встреченные на этих полевках, представлены двумя видами: *Myocoptes japonensis japonensis* Radford, 1955 (Listrophoroidea: Myocoptidae) и *Radfordia hylandi* Fain et Lukoschus, 1977 (Cheyletoidea: Myobiidae).

Discoveries of mummified specimens of fossil mammals, particularly rodents, are not very common. Alluvial deposits of North-East Siberia have long been known as natural repositories of ancient mammals. The good state of preservation of the remains found there is related to the features of development of the permafrost in that region [Vaskovsky, 1959]. A comprehensive study of these discoveries is extremely important not only for the understanding of the evolution of mammals, but also for revealing the composition of past environments.

In summer 1968, the Zoological Institute received five mummified specimens of voles from Yakutia, in particular from the basin of Indighirka River, Creek Surovyi, tributary of Dyurin-Yuryakh River. The conditions of the discovery of these specimens and brief results of the study have been described by Vaskovsky and Feigin [1972]. In the region of the upper flow of Indighirka River, a number of animal specimens have been recovered in alluvial deposits: a limb of a bison with a hoof and hair, three ground squirrels and two wild horses. According to radiocarbon dating, the geological age of the remains of the horse and the vole from the same region was 37,700 ± 2,000 years [Garutt & Yuriev, 1966]. Based on similar taphonomic conditions, the voles have been assumed of the same age, i.e. the Late Pleistocene.

As a result of G.G. Feigin's studies, the voles found have been described as a separate extinct subspecies of narrow-skulled vole, *Microtus* (*Stenocranius*) *gregalis egorovi* Feigin, 1980 [Baranova, Feigin, 1980]. Judged from the thickness and length of the hair cover, the voles were in such a perfect state of preservation that allowed E.F. Sosnina and H.V. Dubinina to collect ectoparasites. A description of the entire material collected, including gamasid mites belonging to the genera *Hyperlaelaps* and *Hirstionyssus*, has been published in the work by Sosnina [1972].

Findings of parasitic arthropods on fossil mammals are extremely rare. As far as we know, only one such finding has been made description a new species of louse, *Neohematopinus relictus*, from the fossil ground squirrel *Citellus glacialis* Vinogradov described by Dubinin [1948].

We have continued the study of material collected from the Pleistocene narrow-skulled vole. The results are reported in the present paper. Acariform mites are represented by two species: *Myocoptes japonensis japonensis* Radford, 1955 (Listrophoroidea: Myocoptidae) and *Radfordia hylandi* Fain et Lukoschus, 1977 (Cheyletoidea: Myobiidae). A brief description of these specimens is given below. All measurements are given in

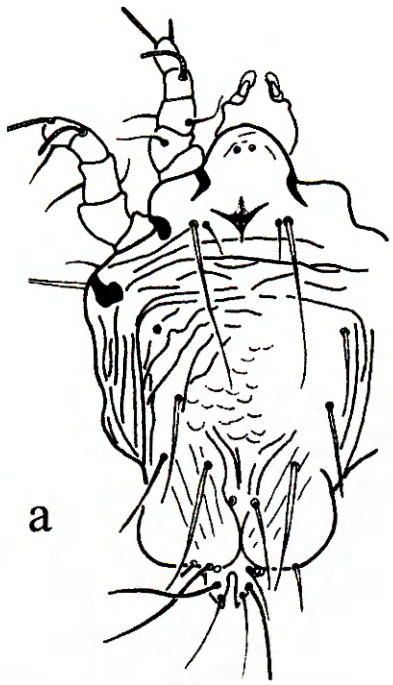
micrometers. The systematics of the subfamily Arvicolinae is given according to Pavlinov & Rossolimo [1987]. The material studied has been deposited in the collection of the Zoological Institute, RAS, St. Petersburg.

Myocoptes japonensis japonensis Radford, 1955
Figs. 1–2.

Material. 1 female, 1 male from one *M.gregalis egorovi*.

Male (Fig. 1).

Body sizes 204 x 129. Length of setae *vi* ?, *sci* 15, *sce* 65, d_1 33, d_2 45, d_3 ?, d_5 81, l_1 24, l_2 54, l_3 27, l_5 179, *h* 92, *sh* 38, *cx*I 31, *cx*III 33, *ga* 24, *gm* 47, a_2 23.



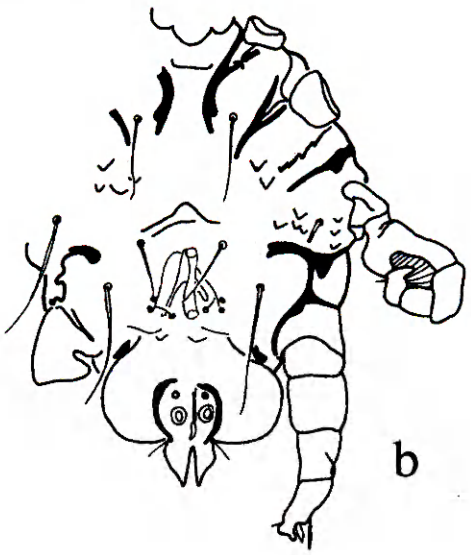
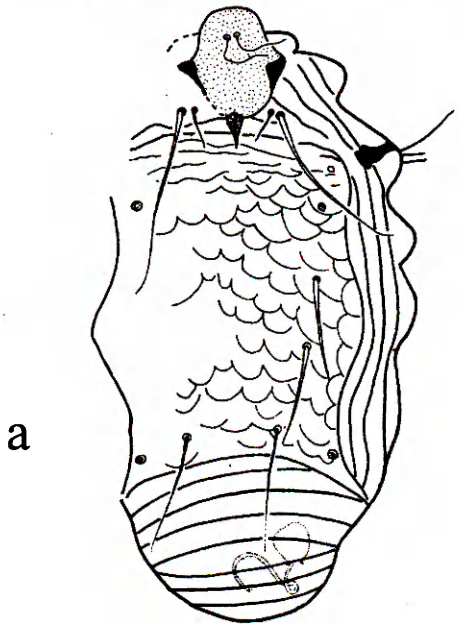


Fig. 1. Dorsal (a) and ventral (b) view of the male *Myocoptes japonensis japonensis*.
Рис. 1. Самец *Myocoptes japonensis japonensis*: a — дорзально, b — вентрально.

Female (Fig. 2).

Body sizes 283 x 144. Length of setae *vi* 25, *sci* ?, *sce* 78, d_1 ?, d_2 45, d_3 56, l_2 54, l_3 ?, l_4 ?13, l_5 ?, *cx*I 45, *cx*III 44, *ga* 33, *gm* 40, *gp* 11, *ai* 14, *ae* 49, a_3 ?23, *h* 112. Distance between bases of setae *ai*–*ae* 33.

The specimens collected are slightly damaged and a number of taxonomically important setae are broken off or lacking. Thus, for females of the genus *Myocoptes* one of the major differential characters is the structure and arrangement of setae l_3, l_4 and a_3. In the only female specimen at hand, setae l_3 are broken off and their bases are highly indistinct. Setae l_4 and a_3 are poorly visible and possibly their true lengths differ from those given in our description.



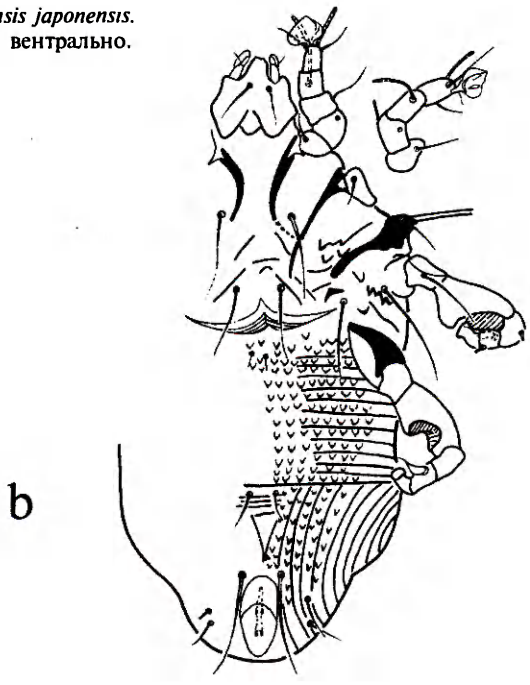


Fig. 2. Dorsal (a) and ventral (b) view of the female *Myocoptes japonensis japonensis*.
Рис. 2. Самка *Myocoptes japonensis japonensis*: a — дорзально, b — вентрально.

Species of the genus *Myocoptes* parasitic on voles are insufficiently well-known. The narrow-skulled vole's specific parasite *Myocoptes japonensis japonensis* [Radford, 1955], to which the specimens examined are most similar, known to be morphologically variable [Fain et al., 1970]. The great degree of variation of *M. j. japonensis* is explained by a complex nature of this taxon.

A direct comparison of our material with the mites belonging to the genus *Myocoptes* taken on recent *Microtus* (*S.*) *gregalis* from Yakutia, all determined by us as *M. j. japonensis*, shows their complete identity apart from the characters not preserved in fossil mites. Probably further studies on the entire complex of mites of the genus *Myocoptes* parasitic on voles will permit a more accurate identification of the fossil specimens. At present we are inclined to refer the latter to the subspecies *M.japonensis japonensis*. However, it cannot be excluded that, after an additional material has become collected, they might prove to represent a separate recent subspecies.

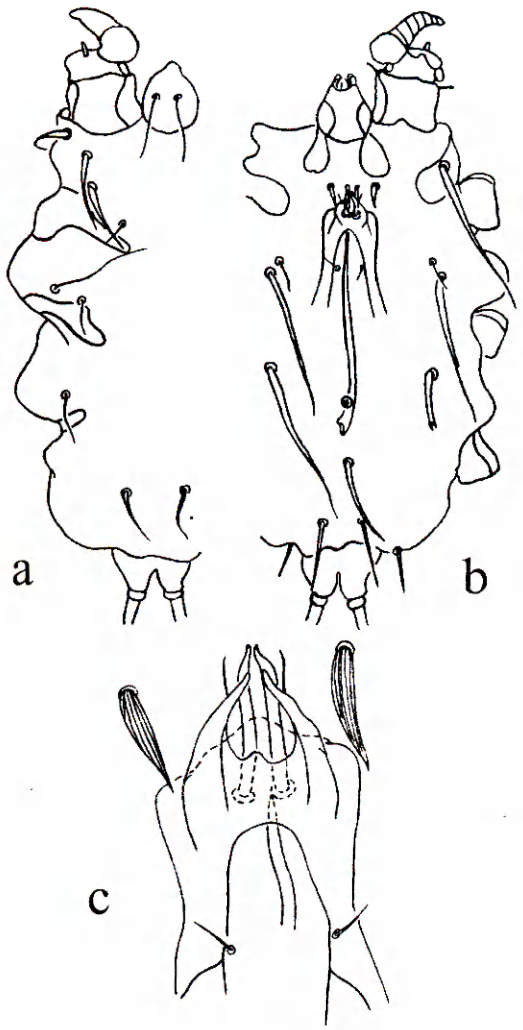


Fig. 3. The male *Radfordia hylandi*: a — ventral view, b — dorsal view, c — genital shield.
Рис. 3. Самец *Radfordia hylandi*: a — вентрально, b — дорзально, c — генитальный щиток.

Radfordia hylandi Fain et Lukoschus, 1977
Figs. 3–4.

Material. 8 females, 3 males, 1TN, 1PN from two *M.gregalis egorovi*.

Male (Fig. 3).

Body size (body length including gnathosoma) 282–295 x 175–191. Length of setae: *vi* 18–20, *ve* 74–78, *sci* 29–31, *sce* 76–78, d_2 48–51, d_3 40–45, l_1 74–78, l_2 47–50, l_3 29–30.

Female (Fig. 4).

Body sizes 337–360 x 200–236. Length of setae: *vi* 65–78, *ve* 83–96, *sci* 101–108, *sce* 78–87, d_1 65–70, d_2 65–72, l_1 69–78, l_2 69–74, l_3 47–56.

Tritonymph. Body sizes 292 x 232. Dorsal side of idiosoma with 13 pairs of setae (d_5 hair-like, all others lanceolated) and with two pairs of anal microchaetae; length of setae on ventral side of idiosoma: ic_2 60, ic_4 22. Chaetome of legs II–IV: trochanter 1–1–0, femur 2–1–0, genu + tibia 5–2–2, tarsus 7(1)–6–3. Tarsi II–III with a claw, tarsus IV without claw.

Protonymph. Strongly damaged. Dorsal side of idiosoma with 11 pairs of setae and one pair of anal microchaetae. Tarsi II–III with a claw, legs IV missing.

R. hylandi has been described from *Microtus pennsylvanicus* Ord (Arvicolinae) deriving from the U.S.A. The mite is currently known from the same host in Canada as well as from other voles: *Microtus mexicanus* (U.S.A.), *Microtus enixus* (Labrador, Canada), *Pitymys pinetorum* (U.S.A.), *Clethrionomys gapperi* (U.S.A. and Canada) [Fain & Lukoschus, 1977].

Fig. 4. Ventral (a) and dorsal (b) view of the female *Radfordia hylandi*.
Рис. 4. Самка *Radfordia hylandi*: a — вентрально, b — дорзально.

The vole genus *Microtus* as well as closely related genera *Terricola*, *Chionomys* and *Pitymys* are widely parasitized by another representative of the mite family Myobiidae: *Radfordia lemnina* (Koch, 1841). *R. lemnina* is known mostly from Old World voles [Fain & Lukoschus, 1977; our own data], having been registered in the New World on the following hosts: *Microtus unalascensis*, *Microtus operarius* Nelson (Alaska, U.S.A.), *Clethrionomys californicus**, *Clethrionomys gapperi** (U.S.A.) [Fain & Lukoschus, 1977]. On the other hand, *R. hylandi* has mainly been found on voles currently restricted the central and southern parts of the Nearctic, i.e. the vole species which have generally been considered as amongst the most ancient migrants from Eurasia. In contrast, *R. lemnina* has been recorded in the Nearctic on the voles which are presumably amongst the descendants of the latest migrants from Eurasia, with their current ranges still lying within or adjacent to Beringia.

The finding of *R.hylandi* in the Pleistocene of Yakutia, northeastern Siberia, makes the above patterns of *R.hylandi* versus *R.lemnina* Recent distribution less clear-cut, implying no straightforward explanations to be made. At least the specimens studied from the recent *Microtus gregalis* from the Chelyabinsk Region, Urals, prove to belong to *R.lemnina*.

The data available on the distribution of *R.hylandi* and *R.lemnina* in North America and in the east of Eurasia are too fragmentary yet. Additional material of recent Myobiidae is necessary to provide a convincing explanation of our finding.

ACKNOWLEDGEMENTS

This work was carried out using "Scientific Collections of the Zoological Institute, Russian Academy of Sciences", which obtain financial support from the Ministry of Science of the Russian Federation (Registration №96-03-16).

REFERENCES

Baranova G.I., Fejgin G.G. 1980. [*Microtus* (*Stenocranius*) *gregalis egorovi* Fejgin ssp. nov. from Late Pleistocene deposits of the Indigirka system] // Sistematica, biologiya i morphologiya mlekopitayushchikh SSSR. L. S.78–83. (Trudy Zool. Inst. T.99) [In Russian]

Dubinin V.B. 1948. [Discovery of Pleistocene lice (Anoplura) and nematodes as a result of study of Indigirka fossil ground squirrels] // Doklady AN SSSR. T.62. Vyp.3. S.417–420. [In Russian]

Fain A., Munting A.J., Lukoschus F.S. 1970. Les Myocoptidae parasites des rongeurs en Hollande et Belgique // Acta Zool. et Pathol. Antverp. №50. P.67–172.

Fain A., Lukoschus F.S. 1977. Nouvelles observations les Myobiidae parasites des rongeurs (Acarina: Prostigmates) // Acta Zool. et Pathol. Antverp. №69. P.11–98.

Garutt V.E., Yuriev K.B. 1966. [Mummified remains of wild horse from the permafrost of the basin of the Indigirka River] // Bull. Commissii po izucheniyu chetvertichnogo perioda. №31. S.86–92. [In Russian]

Pavlinov I.Ya., Rossolimo O.L. 1987. [The systematics of mammals of the USSR] // Trudy Zool. Museya Moscow. Gos. Univer. (Issledovaniya po faune). T.25. 285s. [In Russian]

Radford C.D. 1955. Some new and little known mites of the genus *Myocoptes* Claparede (Acarina: Listrophoridae) // Parasitology. Vol.45. P.275–286.

Sosnina E.F. 1972. [Pleistocene gamasid mites from narrow-skulled vole] // Parazitologiya. T.6. Vyp.5. S.444–450. [In Russian]

Vaskovsky A.P. 1959. [A brief review of vegetation, climate and chronology of the Quaternary in the upper part of the Kolyma River and Indigirka River and on the northern coast of the Sea of Okhotsk] / / Lednikovyi period na territorii Evropeiskoi chasti SSSR i Sibiri. M., MGU. S.510–545. [In Russian]

Vaskovsky A.P., Feigin, G.G. 1972. [A new discovery of mummified prehistoric rodents in the permafrost of the Indigirka River] // Priroda. №5. [In Russian]

* It should be noted that, in our opinion, the finding of this mite species on the vole genus *Clethrionomys* requires a further investigation, as it seems doubtful that such specific parasites as Myobiidae could have occurred on phylogenetically remote hosts belonging to different subtribes of the subfamily Arvicolinae.