

NEW DATA ON THE FAUNA AND BIOLOGY OF ACARID MITES (ACARI, ACARIDAE) FROM THE FAR EAST

НОВЫЕ ДАННЫЕ ПО ФАУНЕ И БИОЛОГИИ КЛЕЩЕЙ-АКАРИД (ACARI, ACARIDAE) ДАЛЬНЕГО ВОСТОКА РОССИИ

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ABSTRACT

Two genera *Schulzea* Zachvatkin, 1941 and *Lackerbaueria* Zachvatkin, 1941, and five species of acarid mites, *Schulzea caucasica* Zachvatkin, 1941, *Lackerbaueria cribratissima* Zachvatkin, 1941, *Sancassania geotruporum* Zachvatkin, 1941, *S.spinitarsus* (Hermann, 1804) and *Schwiebea laphriae* (Samsinak, 1956), comb. n., are recorded in the Far East of Russia for the first time. The genus *Schulzea* and species *Schwiebea laphriae* are new to the fauna of Russia. The distribution of further three little-known species in the Far East is refined. The genus *Schulzea*, hitherto treated as *incertae sedis*, is assigned to the tribe Tyrophagini, subfamily Acarinae. Data on the biology and morphological variations of some species are presented.

РЕЗЮМЕ

2 рода (*Schulzea* and *Lackerbaueria*) и 5 видов (*S.caucasica*, *L.cribratissima*, *Sancassania geotruporum*, *S.spinitarsus* и *Schwiebea laphriae*) акаридиевых клещей указываются впервые для Дальнего Востока России. Род *Schulzea* и вид *Schwiebea laphriae* — новые для фауны России. Подтверждается распространение 3 малоизвестных на Дальнем Востоке видов. Род *Schulzea* с неопределенным систематическим положением (*incertae sedis*) отнесен к трибе Tyrophagini (подсем. Acarinae). Для некоторых видов приводятся сведения по морфологическим вариациям и биологии.

INTRODUCTION

Thirty-four species of the family Acaridae sensu O'Connor [1982] [Zachvatkin, 1941; Tareev, 1970; Volgin, 1975; Tareev & Dubinina, 1985; Dubinina, 1987; Bugrov, 1995; Klimov, 1996] have heretofore been registered from the Far East of Russia. Most are synanthropic or associated with debris cast ashore, so they could have been introduced to the Far East by man. Material on acarid mites taken in natural habitats (environs of Vladivostok and the Khasan Distr.) and from dry insects (the entomological collections of the Institute of Biology and Pedology, Vladivostok) have yielded

two genera and four species yet unknown from the Russian Far East, and further three little-known species which have already been recorded there by Tareev [1970]. Two species, *Sancassania chelone* Oudemans, 1916, and *S.mandzhur* (Zachvatkin, 1940), have been cultivated in the laboratory to obtain all ontogenetic stages. The systematic position and classification of the genus *Sancassania*, with the type-species *Sancassania chelone* Oudemans, 1916 (= *Caloglyphus moniezi* Zachvatkin, 1941, cf. Samsinak [1960, 1980]) are given after Samsinak [1980]. Morphological terminology is that of Zachvatkin [1941]. In addition, leg Chaetotaxy follows that of Griffiths [1977]. Material is kept in the Institute of Biology and Pedology, Vladivostok. Unless otherwise indicated, the mites or insects with mites have been taken by the author. All measurements are given in micrometers.

LIST OF SPECIES

1. *Lackerbaueria cribratissima* Zachvatkin, 1941
Lackerbaueria cribratissima Zachvatkin, 1941: 214, figs 368, 369.
Material. Hypopi, ex *Ectemnius* (*Metacrabro*) *spinipes* (A.Morawitz) (Hymenoptera, Sphecidae), Sakhalin, Yuzhno-Sakhalinsk, 07.1923, coll. unknown; hypopi, ex *E.(M.)fossorius* (L.), Kuril Islands, Kunashir, Yuzhnoye Alekhino, 11.07.1962, coll. G.Krivolutskaja.
Distribution. Russia: Ivanovo Region, Sakhalin, Kunashir.
Remarks. The genus *Lackerbaueria* Zachvatkin, 1941 is being recorded in the Far East of Russia for the first time.
2. *Forcellinia wasmanni* (Moniez, 1892)
Forcellinia wasmanni Zachvatkin, 1941: 117, figs 166-168, 170-172.
Forcellinia wasmanni — Tareev, 1970: 9.
Material. 2 hypopi, ex *Camponotus obscuripes* Mayr (Hymenoptera, Formicidae), Kuril Islands, Kunashir, 24.07.1962, coll. A.Kupyanskaya; 2 hypopi, ex *Formica lugubris* Zett. (Hymenoptera, Formicidae), Kamchatka, nr. Dolynovka, without date, coll. A.Kupyanskaya.
Remarks. The specimens differ from Zachvatkin's [1941] description and figures of hypopi by the presence of long sclerites near the sucker plate and

by the distance between $d1$ and $d2$ (shorter than depicted by Zachvatkin). If these differences prove to be true, the Far Eastern specimens should better be assigned to a new subspecies. The size range of the idiosoma ($n=4$): 232-261 (Kamchatka), 327-337 (Kunashir). Tareev [1970] has reported the species in the Maritime Province (=Primorye). **Distribution.** Palaearctic.

3. *Schulzea caucasica* Zachvatkin, 1941

Schulzea caucasica Zachvatkin, 1941: 227, fig.375.

Material. 1 hypopus, ex *Andrena rosae alfkeni* Friese (Hymenoptera, Andrenidae), Sakhalin, nr. Yuzhno-Sakhalinsk, Botanical Gardens, date and collector unknown; 7 hypopi, ex *Stigmus japonicus* Tsuneki (Hymenoptera, Sphecidae), Vladivostok, 19.07.1986, coll. P.Nemkov. Comparative material: 1 hypopus, ex *Pemphredonlugubris lugubris* Latr. (Hymenoptera, Sphecidae), Irkutsk Region, Baykal'sk, 30.08.1983, coll. P.Nemkov; 2 hypopi, ex *P.flavistigma* Thom., same locality, 2.07.1983, coll. P.Nemkov.

Distribution. Caucasus, Georgia: Kartveli; Russia: Irkutsk region, Maritime Province (=Primorye), Sakhalin.

Remarks. In the original description [Zachvatkin, 1941], the genus was designated as *incertae sedis*. On the basis of the location of the lateral edges of the sternal plate, sucker plate structure and presence of $\delta=aa$ (or ba sensu Fain, 1977) on tarsus I, i.e. the characters resembling those of the genera *Forcellinia* Oudemans, 1924 and *Mycetoglyphus* Oudemans, 1932, the genus should be assigned to the subfamily Acarinae, tribe Tyrophagini. The genus *Schulzea* is being recorded in Russia for the first time.

4. *Sancassania geotruperum* (Zachvatkin, 1941)

Fig. 1

Caloglyphus geotruperum Zachvatkin, 1941:178, figs 266, 267, 307, 308.

Material. 2 hypopus, ex *Geotrupes laevistriatus* Motsch. (Coleoptera, Scarabaeidae), Kuril Islands, Kunashir, Alekhino, 1.07.1963, coll. G.Lafer.; 5 hypopi, ex *G.laevistriatus*, South Sakhalin, 26.09.1923, coll. H.Hori; 8 hypopi, ex *G.laevistriatus*, Japan, Honshu, Mt. Takao, 07.1967, collector unknown; 2 hypopi, ex *G.amoenus* Jacobs., same locality, 08.1967, collector unknown; hypopi, ex *G.laevistriatus*, same locality, Tokyo, 18.04.1966, coll. Machio; 7 hypopi, ex *G.laevistriatus*, Japan, Hokkaido, 1.07.1929, coll. H.Yaku.

Distribution. Europe; Russia: European part, Far East (Sakhalin, Kuril Islands); Japan: Hokkaido, Honshu.

Remarks. The European *S.geotruperum* has been found on *Geotrupes stercorosus* Forst. and *G.mutator* (Mrsh.) [Zachvatkin, 1941; Samsinak, 1956a; Chmielewski, 1977]. The Far Eastern specimens are associated with *G.laevistriatus* and *G.amoenus*. Hypopi of *S.geotruperum* from Far East are similar to those from Europe but differ in following characters (alternative conditions are in parentheses): cx I, III, IV are setiform (suckers), $\gamma=\omega 2$ is weakly clavate (setiform), hysterosomal

surface is punctate (smooth). The Solenidion $\gamma(\omega 2)$ on one tarsus I in one specimen is setiform, while on the tarsus I of other specimens it is typical for the genus.

5. *Sancassania mandzhur* (Zachvatkin, 1940)

Caloglyphus mandzhur Zachvatkin, 1940: 38, figs. 72, 73, 77, 141.

Caloglyphus mandzhur — Zachvatkin, 1941: 163, figs 40, 260, 261, 280, 287, 301, 302.

Caloglyphus mandzhur — Tareev, 1970: 9.

Material. All stages, Vladivostok, cultures (on potato). Cultivation began with mature stages collected on 5.11.1994 from a decaying onion, Vtoraya Rechka, Vladivostok, 9.12.1994; all stages, cultures on apple (same data), 25.01.1995; 3 hypopi, ex *Holotrichia inelegans* Lew. (Coleoptera, Scarabaeidae), Primorye, Khorol Distr., Belmanovka, potato field, 1.09.1966, coll. G.Lafer.

Biology. Hypopi of this species have hitherto been known from cultivated specimens only. We have discovered them to be phoretically associated with the scarabaeid beetle *Holotrichia inelegans*.

Distribution. Russia: Maritime Province (=Primorye); China: Harbin.

Remarks. The species has first been described upon material taken from a cargo of garlic shipped from Harbin, northeastern China [Zachvatkin, 1941]. Tareev [1970] has reported the species from Primorye. There are 5 or 6 pairs of microsetae near the female anus. The ambiomorphic specimens are registered among the males.

6. *Sancassania chelone* Oudemans, 1916

Caloglyphus moniezi — Zachvatkin, 1941: 173, figs 285, 303 (part).

Sancassania chelone — Fain, 1977: 109, figs 7—12.

Sancassania chelone — Cerny & Samsinak, 1971: fig.28.

Caloglyphus moniezi — Tareev, 1970: p.9.

Material. Russia, Primorye: 5 hypopi*, ex *Hoplosternus incanus* Motsch. (Coleoptera, Scarabaeidae), Khasan Distr., Ryazanovka, 20.08.1992; hypopi*, ex *Holotrichia* sp., same locality, 16.07.1990, collected by students of the Far Eastern State University (FESU); hypopi*, ex *H.incanus*, same locality, 21.07.1990, collected by FESU students; 1 hypopus*, ex *Anomala luculenta* Er., same locality, without date, collected by a FESU student; 3 hypopi*, ex *Geotrupes amoenus*, same locality, 22.08.1993, collected by FESU students; 8 hypopi*, ex *Hilyotrogus bicoloris* Heyd., same locality, 7.07.1985, coll. G.Lafer; 1 hypopus*, ex *A.luculenta*, Khasan Distr., Golubinyi Utes, 1.08.1974, collector unknown; 6 hypopi*, ex *Eotrichia titanis* Reitt., mouth of Suifun, 4.06.1967, coll. G.Lafer; 14 hypopi*, ex *Holotrichia diomphalia* Bat., Bolshoy Pelis Island, 14.06.1967, coll. M.Kazykhanova; males & females, culture on potato [material (hypopi) for the culture taken from Primorye, Khasan Distr., Ryazanovka, ex *H.incanus*, without date], 3.03.1996; 7 hypopi*, 4 hypopi**, ex *Lasiopsis (Lasiopsis) golovjankoi* S.Medv., Ussuriiskii Reserve, 19.07.1973, coll. Kalinina; 3 hypopi**, ex *L.(Brahmina) agnellus* Fald., Malyi Ulis, 15.07.1960, collector unknown; 1 hypopus**, ex

* — forma spinifera, ** — forma setifera (see below).

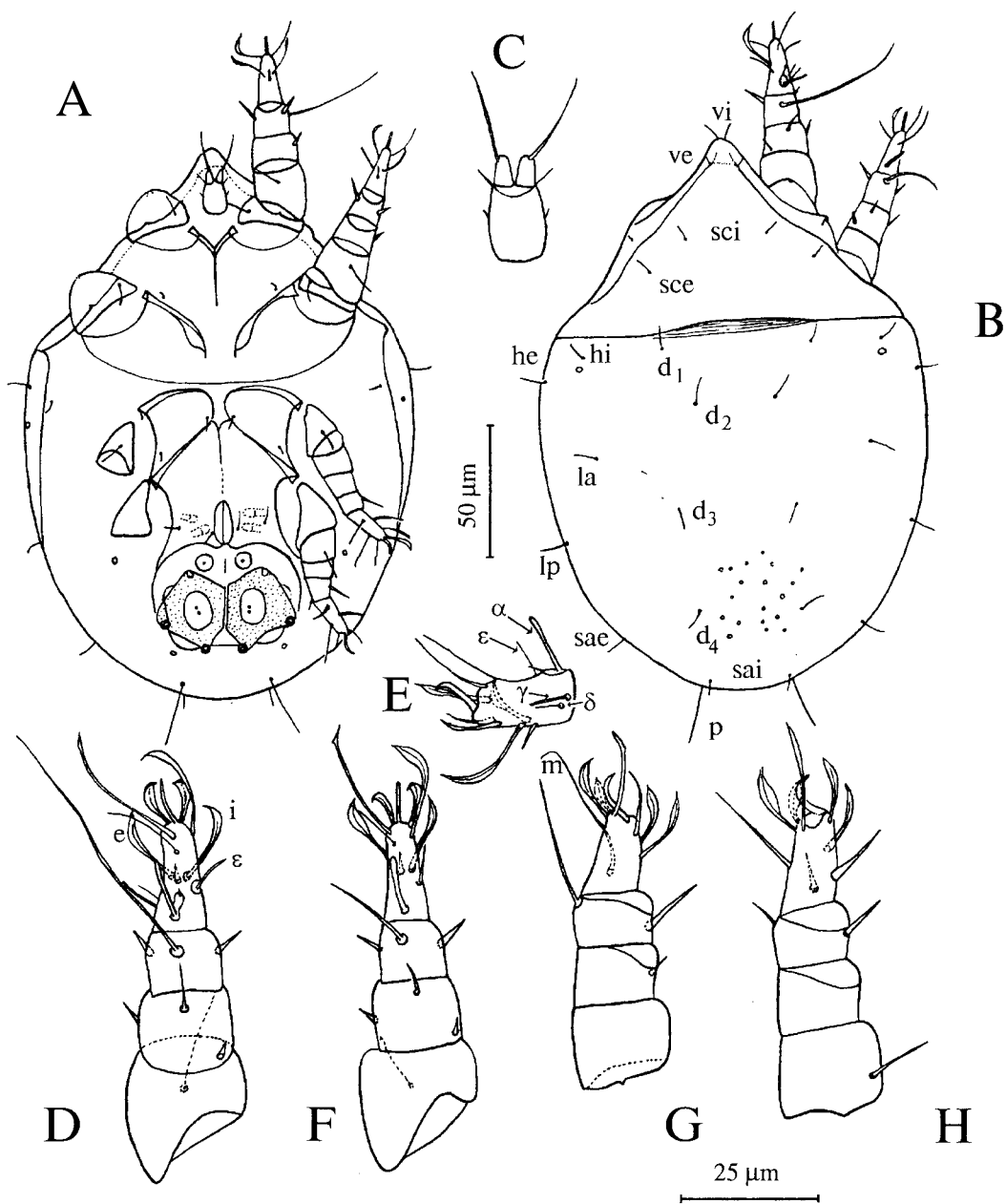


Fig. 1. *Sancassania geotruporum*. Hypopus: A — ventral view; B — dorsal view; C — gnathosoma; D — leg I, dorsal view; E — tarsus I, lateral view; F, G, H — legs II-IV, respectively.

Рис. 1. *Sancassania geotruporum*. Гипопус: А — вид сверху; В — вид снизу; С — гнатосома; D — нога I, вид сверху; E — лапка I, вид сбоку; F, G, H — ноги II-IV, соответственно.

H. diomphalia, Gorno-Tayozhnaya Station, 3.08.1945, coll. Z. Onisimova; 4 hypopi**, ex *Holotrichia inelegans*, Anuchino Distr., Karnalovka, 15.06.1966, coll. Makrenok; 4 hypopi** with hypopi of *S. geotruporum*, on *G. laevistriatus*, Sakhalin, 26.09.1923, coll. M. Hori; 2 hypopi**, ex *Hep-
tophylla picea* Motsch., Japan, Kyushu, 25.07.1956, coll. Tamanuki. Comparative material: 1 hypopus, ex *Polyphylla fullo* L., Ukraine, Kherson Region, Rybachie, 10.07.1980, collector unknown; 3 hypopi, same data.

Distribution. Russia: Primorye, Sakhalin; Japan: Kyushu. Widely distributed in Europe.

Remarks. In our material, males differ from Moniez' [1892] description of those of *S. chelone* [cf. Zachvatkin, 1941] by the following characters (alternative conditions in parentheses): total length 1013-1209 (810); idiosoma 885-1104 long (720-730); length d_3 /length d_2 ratio 2.4, lp/d_2 ratio 4.9, d_4/d_2 ratio 4.2, lp/d_3 ratio 1.7, d_4/d_3 ratio 2.0 (d_2

and d_3 almost equal in length, either more than two times shorter than d_4 and considerably shorter than lp), idiosomal setae smooth, but female d_4 and sae weakly serrate at tip (all idiosomal setae serrate at tip); tarsus IV with one widened seta (with two widened setae, this character; probably corresponding to the female). Proportions of length of setae and they arrangement in female are similar to those of Cerny & Samsinak's [1971] figure. The Far Eastern specimens of hypopi (forma spinifera, see below) are closely related to European ones, but differ in following features (alternative conditions in parentheses): idiosoma 234—461 long (224—392 [Vitzhum, 1924—cf. Zachvatkin, 1941]; 351 [Fain, 1977]; 309-352, n=4, our material); genu I 24-39, 1.35-1.82 times as long as tibia I (21-23 and 1.12-1.34, resp., n=4, our material, genu I/length of tibia

1—1.35 in Fain's [1977] figure). Two forms of hypopi occur in *S. chelone*: forma spinifera with a spine on the external side of genu II (idiosoma 305—343 long, median +SD=391+41, n=31), and forma setifera with a seta on genu II (idiosoma 250—326 long, median +SD=288+19, n=18). In most cases, both forms of hypopi are found on beetles separately. They seem to have genetic differences and the expression of their phenotypes is not conditional. Hypopi are phoretically associated with a variety of scarabaeid beetles (Coleoptera, Scarabaeidae); most hypopi have been collected on *Hoplosternus* and *Holotrichia*; both forms have been found on one specimen of *Lasiopsis golovjankoi* and on different specimens of *Holotrichia diomphalia*. In two males, a (ω 1) on tarsi II are reduplicated; in one specimen, an additional Solenidion (a) occupies different places on both tarsi II; in another specimen, a is absent from one tarsus II.

7. *Sancassania spinitarsus* (Hermann, 1804)

Caloglyphus spinitarsus — Zachvatkin, 1941: 166, figs. 281, 282, 306.

Material. 1 hypopus, ex *Osmoderma barbinata* Motsch. (Coleoptera, Scarabaeidae), Primorye, Ussuriiskii Reserve, no date; coll. P.Lehr; 1 hypopus, ex *O.opicum* Lew., Primorye, Ussuriysk Distr., 06-08.1966, coll. M.Kashcheev.

Distribution. Russia: Primorye; Europe.

Remarks. Our material differs from Zachvatkin's [1941] description as follows (alternative conditions are in parentheses): idiosoma 459—500 long (400—420); *vi* placed near anterior propodosomal edge (shifted considerably away from the edge); length of legs I is 0.2 times of idiosomal length (shorter); $\gamma=\omega$ 2 located on tarsus I behind $\alpha=\omega$ 1 (before). Apparently, the Far Eastern specimens belong to a separate subspecies.

8. *Schwiebea laphriae* (Samsinak, 1956) **comb. n.**

Troupeauia laphriae Samsinak, 1956b: 355, fig.2.

Material. 2 hypopi, ex *Laphria nigripes* Param., 1929 (Diptera, Asilidae), Khabarovskiy Kray, env. Vysokogorniy, 18.07.1965, coll. Esipenko; Primorye: 9 hypopi, ex *L.flava* L. 3 km. E Rettikhovka, coll. N.Kurzenko; 6 hypopi, ex *L.rufa* Roed 1887, stream Pavlovka S Schumnyi, 23.08.1987, coll. P.Lehr; 13 hypopi, ex *L.nigripes*, env. Sokol'chi, 23.07.1979, coll. P.Lehr.

Comparative material: 3 hypopi, ex *L.flava*, «Bohemia» (=Czech Republic), 4.07.1954, coll. Z.Hradsky; 1 hypopus, ex *L.flava*, Kemerovsk Region, right bank of river Tugujas, 50 km. Myski, 9.07.1971, coll. A.Leley.

Distribution. Russia: Kemerovo Region, Khabarovsk Territory, Primorye; Czech Republic.

Remark. The species phoretically associated with asilid flies of the genus *Laphria* (*L.flava*, *L.nigripes*, *L.rufa*).

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