

Mite Parasites (Acarina) of Bats from Afghanistan

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Abstract. The following 18 species of parasitic mites have been recorded from bats captured in the territory of Afghanistan: *Spinturnix acuminatus* (C. L. Koch, 1836), *S. kolenatii* Oudms., 1910, *S. psi* (Kol., 1856), *Macronyssus leucippe* (Domrow, 1959), *Macronyssus* sp. (apparently *japonicus* Radovský, 1967), *Staetonyssus (Staetonyssus) periblepharus* Kol., 1858, *S. (S.) afer* Radovský et Yunker, 1963, *Androlaelaps casulicis casulicis* (Berl., 1887), *Argas (Carios) vespertilionis* (Latreille, 1802), *A. (Chiroppterargas) boueti* Roubaud et Colas-Belecour, 1933, *A. (Secretargas) transgariepinus* White 1846, *Ixodes (Eschatocephalus) vespertilionis* C. L. Koch, 1844, *Haemaphysalis (H.) erinacei* Pavesi, 1884, *Audytrombicula (A.) taumasia* V.-G., 1963, *Sasatrombicula (Traubiella) multisternalae* (V.-G., 1963), *Chiroptella (Oudemansidium) muscae* (Oudms., 1906). Two new species *Spinturnix scuticornis* sp. n. and *Staetonyssus (S.) gaisleri* sp. n. are described and a first description of male of the species *Macronyssus leucippe* (Domrow, 1959) is given.

The parasitic Acarine fauna of bats living in Afghanistan has been heretofore studied only occasionally, and mainly tick fauna (Ixodoidea) has been recorded; on one hand, the ticks were collected by the Third Danish Expedition to Central Asia and by J. Klapperich Afghanistan expedition (ANASTOS 1954, 1956), on the other, during Lindberg's biospeleological investigations (LINDBERG 1961, 1962, TRAVASSOS SANTOS DIAS 1959, 1961, NEMENZ 1960). These collections also included specimens of the family Trombiculidae from bats which were studied by VERCAMMEN—GRANDJEAN (1962, 1963). The data on free living groups of mites inhabiting caves in Afghanistan, i.e. those often associated with bats, are to be found in COOREMAN's paper (1960). The data on hosts alone were published by ZIMMERMANN (1956), AELLEN (1959), MEYER—OEHME (1965) and GAISLER, POVOLNÝ, ŠEBEK and TENORA (1968).

From March to May 1967 an expedition of Czechoslovak parasitologists and zoologists, headed by Dr. Povolný, worked in Afghanistan with the aim of studying mainly insects, small mammals and their parasites. Materials of parasitic mites collected from bats by this expedition, together with the collections of Dr. Daniel, who participated in the First Czechoslovak expedition to Hindu-Kush (June to September 1965) have served as a basis for the present paper.

The author is deeply grateful to all, who in any way participated in collections of the material described in this paper. Special thanks are due to Dr. D. Povolný (University School of Agriculture, Brno) and Dr. M. Daniel (Institute of Parasitology, Czechoslovak Academy of Sciences, Prague) for making available the material to study, and to Dr. J. Gaisler (Institute of Vertebrate Zoology, Czechoslovak Academy of Sciences, Brno) who provided comments on a draft of this paper, edited the local names and identified the host material. The author also wishes to extend his appreciation to Dr. F. Tenora (University School of Agriculture, Brno) and to Dr. Z. Šebek (District Hygiene Station, Jihlava) who took part in collections.

1. *Spinturnix acuminatus* (C. L. Koch)

Pteroptus acuminatus C. L. Koch, 1836 — Deutsch. Crust., Myr. Arachn. Heft 4 : 21.

Material: 1 ♂ from *Pipistrellus pipistrellus* (Schreb.), Jalalabad, 25. 4. 1967, lgt. Gaisler, Povolný, Šebek, Tenora.

A palearctic species whose distribution boundary line reaches as far as Ceylon and Java (RUDNICK 1960). It has been reported from Israel by SHULOV (1957) and COSTA (1966) off *Pipistrellus kuhli* (Kuhl) and in Ceylon it has been found on *Scotophilus temmincki urroughtoni* Thomas. Its two subspecies are known from Europe: *acuminatus* C. L. Koch, 1836, parasitic on *Nyctalus noctula* (Schreb.) and *barbastelli* (Kol., 1856) (= *bohemicus* Dusbábek, 1962) described from *Barbastella barbastellus* (Schreb.). Our specimen, however, does not agree with any described subspecies and therefore, it is possibly a distinct subspecies specific to the genus *Pipistrellus*.

2. *Spinturnix kolenatii* Oudemans.

Spinturnix kolenatii Oudemans, 1910 — Ent. Ber., Amsterdam 3 (53):68.

Material: 1 ♀ 2 ♂♂ from *Eptesicus serotinus* (Schreb.), Jalalabad, 13. 4. 1967; 1 ♀ 3 ♂♂ from the same host and locality, 22. 4. 1967; 2 ♀♀ 1 ♂ from the same host and locality, 26. 4. 1967, all lgt. Gaisler, Povolný, Šebek, Tenora.

A palearctic species, known from *Eptesicus serotinus* (Schreb.) and *E. nilssoni* (Keys. et Blas.). Most findings of this species originate from Europe, but also, findings have been reported from Mongolia (DUSBÁBEK 1966) on *E. nilssoni* (Keys. et Blas.) and from Azerbaijan (GADZHIEV and DUBOVCHENKO 1966, 1967) on *E. serotinus* (Schreb.), occasionally also on *Pipistrellus pipistrellus* (Schreb.) and *P. kuhli* (Kuhl).

3. *Spinturnix psi* (Kol.)

Pteroptus psi Kolenati, 1856 — Allg. Deutsche Naturk. Ztg. (ser. 2), 2: 182

Material: 14 ♀♀ 11 ♂♂, 8 deutonymphs and 2 protonymphs from *Miniopterus schreibersi* (Kuhl), Jalalabad, 3. 5. 1967, lgt. Gaisler, Povolný, Šebek, Tenora.

This species is distributed all over the palearctic region, reaching as far as India (HIREGAUDAR and BAL 1955, 1956), New Guinea (BAKER and DELFINADO 1964), Australia (DOMROW 1962) and Madagascar (RUDNICK 1960). COSTA (1966) reports it from Israel. It parasitizes primarily members of the genus *Miniopterus* and exceptionally other genera of hosts.

4. *Spinturnix scuticornis* sp.n.

Figs. 1, 2

Type host: *Myotis longipes* (Dobson). Type locality: Jalalabad, Afghanistan, 15. 3. 1967, lgt. Gaisler, Povolný, Šebek, Tenora.

Material: 19 ♀♀ 17 ♂♂ 6 protonymphs and 5 deutonymphs from type host and type locality, 15. 3. 1967; 18 ♀♀ 15 ♂♂ 7 deutonymphs and 8 protonymphs from type host and type locality, 18. 4. 1967; 2 ♀♀ 1 ♂ 3 deutonymphs and 1 protonymph from *Miniopterus schreibersi* (Kuhl), Jalalabad, 15. 3. 1967; 5 ♀♀ 8 ♂♂ 3 deutonymphs from type host and locality, 3. 5. 1967, all lgt. Gaisler, Povolný, Šebek, Tenora.

Holotype (female), allotype (male) and all paratypes are deposited in the collection of the Institute of Parasitology, Czechoslovak Academy of Sciences in Prague.

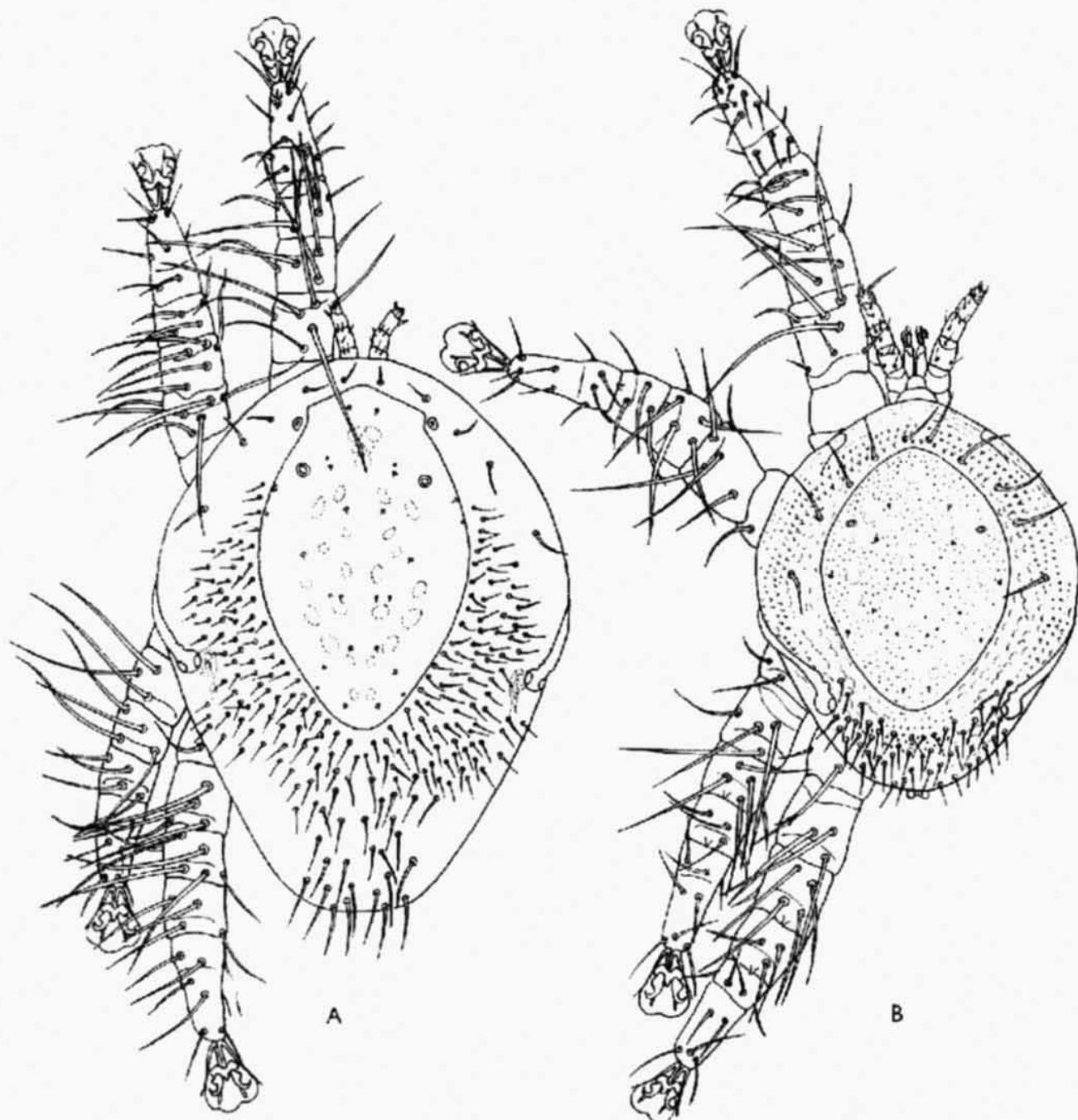


Fig. 1. *Spinturnix scuticornis* sp. n.: A — dorsal view of female, B — dorsal view of male.

Female (Holotype): Idiosoma ovoid, 1.320 (1.104—1.330) long and 1.032 (912 to 1.080) wide (all measurements in μ).

Dorsum (Fig. 1 A): Dorsal plate of characteristic shape, with two lateral cornua in anterior part, 804 (790—857) long, 542 (513—554) wide. On the plate there are

13 pairs of small circular pores, of which some bear minute setae, and several larger irregular depressions. A pair of larger circular pores is developed outside the plate near the anterior cornua and another pair somewhat lower inside the plate. Anteriorly to dorsal plate 5 pairs of propodosomal setae of which the first pair is the

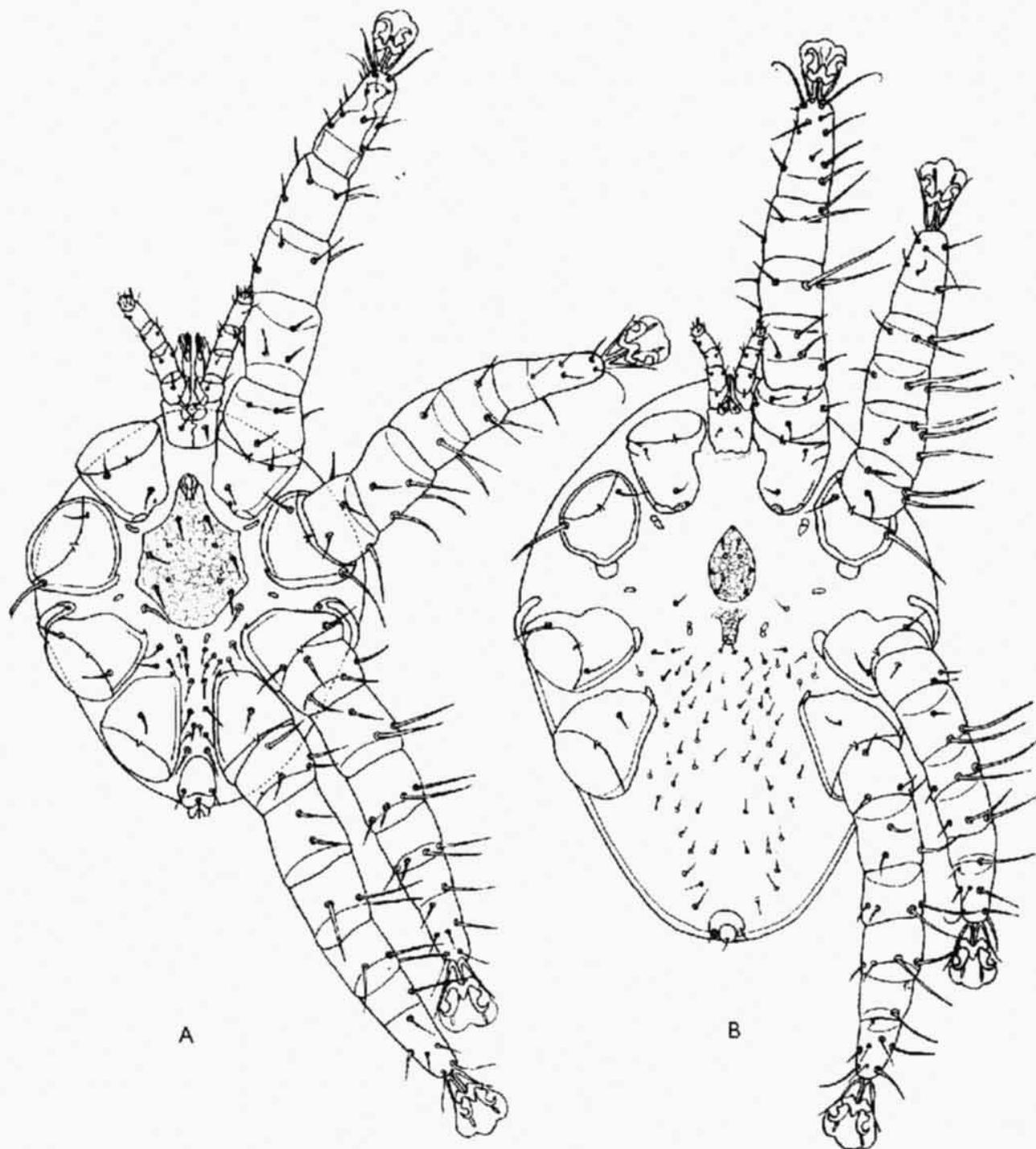


Fig. 2. *Spinturnix scuticornis* sp. n.: A — ventral view of male, B — ventral view of female.

shortest (40), the fourth and fifth the longest (85). Integument alongside the dorsal plate is, besides propodosomal setae, covered with further 95—105 pairs of setae, of which the metapodosomal ones are short and slender (40), the opisthosomal long and rough (160). Peritreme originates dorsally at the level of posterior margin of coxa III and reaches ventral side, terminating between coxa II and III.

Venter (Fig. 2 B): Tritosternal plate is absent. Sternal plate relatively narrow, apiculate anteriorly, with tile-like structure, 172 (168—196) long, 117 (110—130) broad. Sternal setae placed inside the plate, 24 long. Genital plate small, with even structure. Genital setae beneath the plate. Two pairs of intercoxal and a pair of metasternal platelets developed.

Gnathosoma: Base of gnathosoma rather narrow. Gnathosomal setae longer (27) than hypostomal ones (14). Chelae dentate in distal part.

Legs: Coxa II with a semicircular posterolateral projection. Coxa III and IV with a similar smaller projection. Ventrolateral and dorsal setae long, rough to dentate.

Male (Allotype): Idiosoma egg-shaped, 939 (920—970) long, 775 (746—805) broad.

Dorsum (Fig. 1 B): Dorsal plate egg-shaped, with only 8 pores and setiform structures and with one pair of larger pores in anterior part, with irregular depressions and prominent punctation. Five pairs of propodosomal setae are 121—130 long each. Hysterosoma bears 23—26 pairs of setae (78—86). Integument alongside the dorsal plate armed with microdenticles, particularly in anterolateral and posterior parts of idiosoma. Peritreme originates dorsally at the level of coxa II and III, with weakly developed peritremal plate, slightly overlapping the end of peritreme.

Venter (Fig. 2 A): Tritosternal plate absent, but in some paratypes it is weakly discernible. Genitoventral plate with a tile-like structure, reaches its maximal width at the level of the third pair of genitoventral setae, 360 (352—388) long, 262 (262—282) wide. Three pairs of genitoventral setae (31) placed on the plate. Two pairs of intercoxal and a pair of metasternal platelets developed. Metasternal setae are 40 long. Posteriorly to genitoventral plate there are 11 pairs of setae (40—55), increasing in length posteriorly. One pair of adanal and an unpaired postanal seta developed.

Gnathosoma: As in female, relatively wider. Chelicerae with a stout hook-like spermatodactyl.

Legs: As in female. Coxa II—IV without a posterolateral projection, or only with a trace of it.

The new species is morphologically close to *Spinturnix multisetosus* Rudnick, 1960, described from *Myotis goudotii* Smith in Madagascar. The female of *S. scuticornis* sp.n., however, differs in the characteristic shape of dorsal plate on which anterolateral cornua are developed, in the number of dorsal hysterosomal setae from which the propodosomal setae are clearly separated, in narrower sternal plate and posterolateral projections on coxae II—IV. The male also differs, besides having a smaller number of dorsal hysterosomal setae, in the shape of genitoventral plate which reaches its maximal width at the level of the third pair of genitoventral setae. There is an apparent difference between the two species also in host specificity and in geographical distribution. It is possible that in case of 3 nymphs of

Spinturnix multisetosus Rudnick, 1960 found on *Eptesicus serotinus* (Schreb.) in Azerbaijan as reported by GADZHIEV and DUBOVCHENKO (1966, 1967), the species in question is *S. scuticornis* sp.n., whose occurrence in Azerbaijan is more probable.

5. *Macronyssus leucippe* (Domrow)

Fig. 3

Ichoronyssus leucippe Domrow, 1959—Proc. Linn. Soc. New South Wales 83:227.

Material: 3 ♂♂ 2 ♂♂ from *Miniopterus schreibersi* (Kuhl), Jalalabad, 15. 3. 1967; 3 ♀♀ from *Myotis longipes* (Dobson) from the same locality and data; 1 ♀ from *Rhinopoma microphyllum* (Brünnich), Abdulkil, near Shigi, 14. 4. 1967, all lgt. Gaisler, Povohý, Šebek, Tenora.

The mite has been described on the basis of several female specimens found on *Miniopterus schreibersi blepatis* (Temminck) in Queensland, Australia. Its findings in Afghanistan are therefore surprising, but may be explained by a larger distribution area of the host *Miniopterus schreibersi* (Kuhl). As the male has not been described yet, I present its description and illustration.

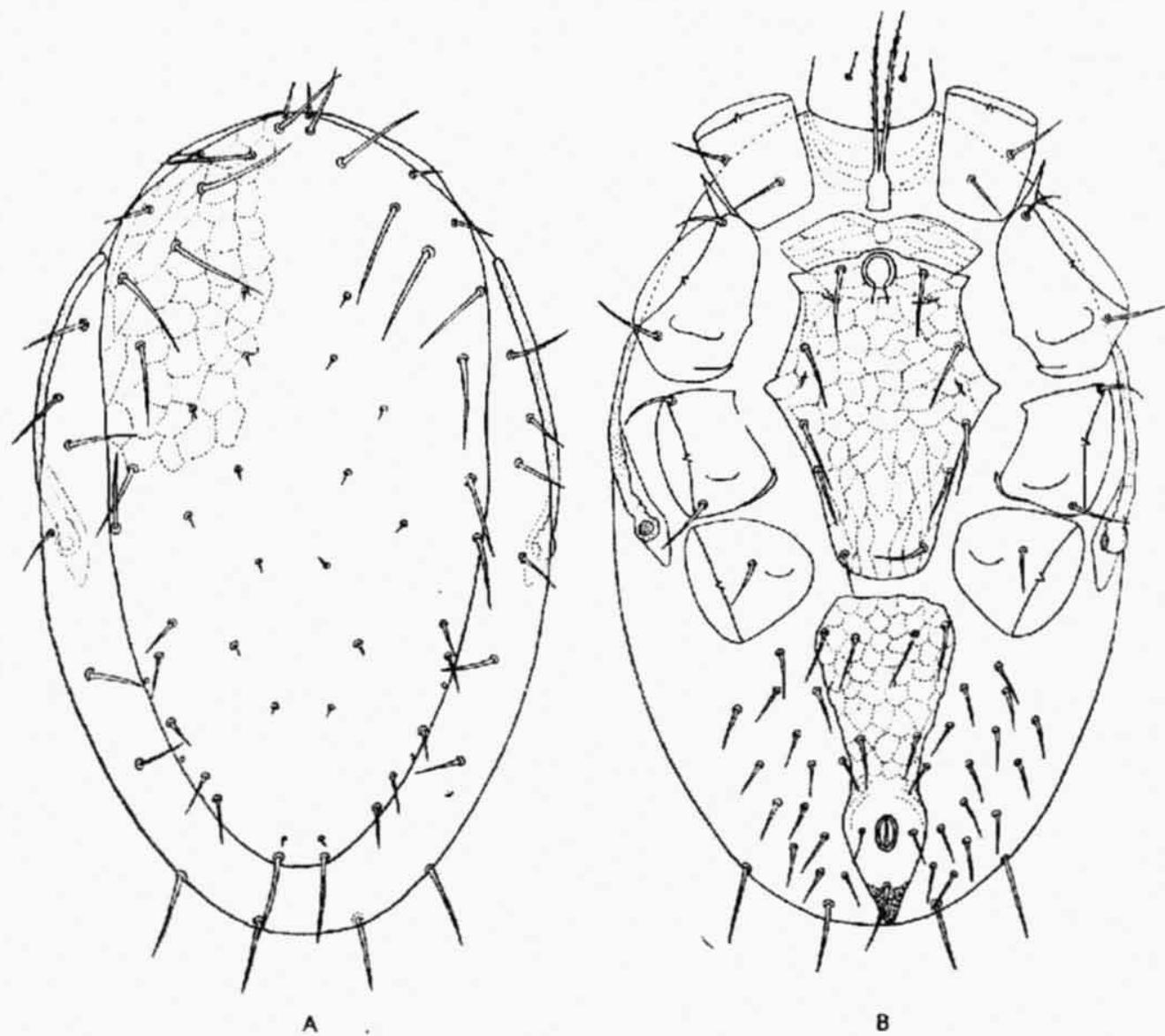


Fig. 3. *Macronyssus leucippe* (Domrow, 1959), male: A — dorsal view, B — ventral view.

Male: Idiosoma oval, 474—485 long, 187—197 wide (all dimensions in μ).

Dorsum (Fig. 3 A): Dorsal plate 407—426 long, 215—235 wide, with a fine tile-like structure and extruding posterior margin. There are 26 pairs of setae on it. Setae S6 and D8 absent; ET1 and ET2 placed on plate. The ratio of Sc—D3 is about 7.5 : 1. Lateral setae in anterior part of plate as long as 40—75, in posterior part of plate 20—27, except M11 which are 43 long. Setae inside the plate (series D and I) are 8 to 12 long. Integument alongside the plate bears 6 pairs of setae and 2 pairs of longer caudal setae which are 38—40 long.

Venter (Fig. 3 B): Tritosternal lacinia barbed. Praesternum with a fine structure. Sternogenital plate 200 long, 129 wide, with a tile-like structure, bearing 5 pairs of setae, of which the first three pairs are 40, the fourth 27 and the fifth 20 long. Ventroanal plate 188 long, 90 wide, structured, bearing 3 pairs of setae in its anterior part (27), a pair of adanal setae (20) and one postanal seta (32). Besides 2 pairs of caudal setae integument bears another 14 pairs of setae 20 long. Peritreme originates ventrally at the level of posterior margin of coxa III and terminates dorsally at the level of centre of coxa III, with a slightly discernible peritremal platelet at the base. Its length is 165.

Gnathosoma: Deutosternum with 9 denticles arranged in a single file. Palptrochanter with ventral chitinized projection. Chelae smooth, spermatodactyl developed. Digitus fixus 19, digitus mobilis 41, spermatodactyl 25 long. Gnathosomal setae 12 long, are slightly longer than hypostomal setae.

Legs: as in female. Anterior spur of coxa II simple. Coxal ridges distinct. Tarsus I measures 82.

6. *Macronyssus* sp.

Material: 1 ♀ from *Myotis longipes* (Dobson), Jelalabad, 15. 3. 1967, lgt. Gaisler, Povolny, Šebek, Tenora.

The found specimen is probably identical with *Macronyssus japonicus* Radovsky, 1967, described from *Myotis* sp. captured in Japan, which it strongly resembles. From the original description, however, it differs in the following details: Setae ET1, ET2, S1 and S6 are placed on dorsal plate, the total number of pairs of dorsal setae thus being increased to 25. Sc-D3 ratio is only 18 : 1. Also some dimensions are somewhat different (abbreviations after RADOVSKY 1967, dimensions in μ): Idiosoma L., 814. Dorsal plate L., 755, W., 360. Sc, 145. D3, 8. M5, 118 (?). S4, 18. S7, 21 (?). M10, 82. M11, 50. Sternal plate median L., 59. Stl, 78. Anal plate L., 130. W., 59. Adanal setae 32. Postanal seta 58. Caudal setae 82. Tarsus I. L., 149.

7. *Steatonyssus (Steatonyssus) periblepharus* Kol.

Steatonyssus periblepharus Kolenati, 1858 — Wien, Ent. Monatschr. 2 : 6; 1959 — Sitzungsber. K. Akad. Wissensch. Wien, Math.-Naturw. Cl. 35 : 186.

Material: 5 ♀ 1 ♂ 28 protonymphs from *Pipistrellus pipistrellus* (Schreb.), Kunduz, 4. 9. 1965; 18 ♀ 7 ♂ 25 protonymphs from the same host and locality, 5. 9. 1965, all lgt. M. Daniel; 2 proto-

nymphs from the same host, Jalalabad, 24. 4. 1967; 2 ♀♀ 1 ♂ 48 protonymphs from the same host and locality, 25. 4. 1967; 2 protonymphs from *Pipistrellus coromandra* (Gray), Jalalabad, 29. - 30. 4. 1967, all lgt. Gaisler, Povolný, Šebek, Tenora.

A palearctic species, distributed as far as Egypt, Lebanon (RADOVSKY 1967) and Israel (COSTA 1966). It parasitizes mainly members of the genus *Pipistrellus*, but has been also found on members of the genera *Myotis*, *Plecotus* and *Eptesicus*.

8. *Steatonyssus (Steatonyssus) afer* Radovský et Yunker

Steatonyssus afer Radovský et Yunker, 1963 - J. Parasitol. 49, 2 : 335.

Material: 5 ♀♀ 1 ♂ from *Eptesicus serotinus* (Schreb.), Jalalabad, 13. 4. 1967; 14 ♀♀ 6 protonymphs from the same host and locality, 26. 4. 1967; 6 ♀♀ 6 ♂♂ and 25 protonymphs from the same host and locality, 22. 4. 1967; 2 protonymphs from the same host and locality, 24. 4. 1967; 1 ♀ from *Rhinopoma microphyllum* (Brunnich) or *R. hardwickei* Gray, Chaknaur, 19. 4. 1967, all lgt. Gaisler, Povolný, Šebek, Tenora.

This species is known only from Angola and Sierra Leone and has been found on *Nycteris macrotis* Dobson and on *Eptesicus tenuipinna* (Peters) and *Pipistrellus nanus* (Peters). Geographically our findings are interesting, but due to the occurrence of elements of Ethiopian fauna in Central Asia they are not surprising. Our specimens differ in some details from the original description published by RADOVSKY and YUNKER (1963) and the redescription by TILL and EVANS (1964). These little differences show primarily in some dimensions (larger dorsal plates in female, longer tarsus I to IV both in male and female, shorter caudal setae in male and shorter terminal setae on opisthosomal plate in female), in the presence of 8 deutosternal teeth instead of 7 in female (after TILL and EVANS 1964). Peritreme of male terminates before the anterior margin of coxa III, but its length is preserved (86). In other morphological characters our specimens fully agree with the original description and therefore the mentioned differences may be regarded as intraspecific variabilities, or subspecific features only.

9. *Steatonyssus (Steatonyssus) gaisleri* sp.n.

Figs. 4, 5

Type host: *Eptesicus nasutus* (Dobson). Type locality: Bisut, Afghanistan, 2. 4. 1967, lgt. Gaisler, Povolný, Šebek, Tenora. Material submitted by natives.

Material: 1 ♀ 2 ♂♂ 5 protonymphs from type host and type locality, lgt. Gaisler, Povolný, Šebek, Tenora.

Holotype (female), allotype (male) and all paratypes are deposited in the collection of the Institute of Parasitology, Czechoslovak Academy of Sciences, Prague.

Female (Holotype): Idiosoma 890 long, 630 wide (all dimensions in μ). The specimen is fully engorged with blood and therefore its clarification is not perfect and some details are discernible with difficulty.

Dorsum (Fig. 4 A): Propodosomal plate 302 long, 266 wide, with 11 pairs of setae. Lateral setae somewhat thicker than submedial ones, 35—47 long; submedial setae 31—43 long, setae V not reduced at all and 31 long. Opisthosomal plate unusually elongated, 445 long, 215 wide. Submedial setae (D5, D6, D8) indiscernible, but probably developed. Posterolateral setae (S6, M10, M11) subequal, 19—21 long, subterminal setae developed, 6 long. Neotrichous setation on this

plate is probably not developed. Integument along the plate bears 42 pairs of thickened setae, 55—63 long, caudal setae 60 to 66 long.

Venter (Fig. 4 B): Tritosternal lacinia smooth. Sternal plate with strongly chitinized posterior margin, 52 long (in median axis), 160 wide (at the level of St 3). Sternal setae slender, measuring: St1—32, St2—43, St3—51. Metasternal setae 50 long. Genital plate relatively wide, rounded posteriorly. Anal plate 176 long,

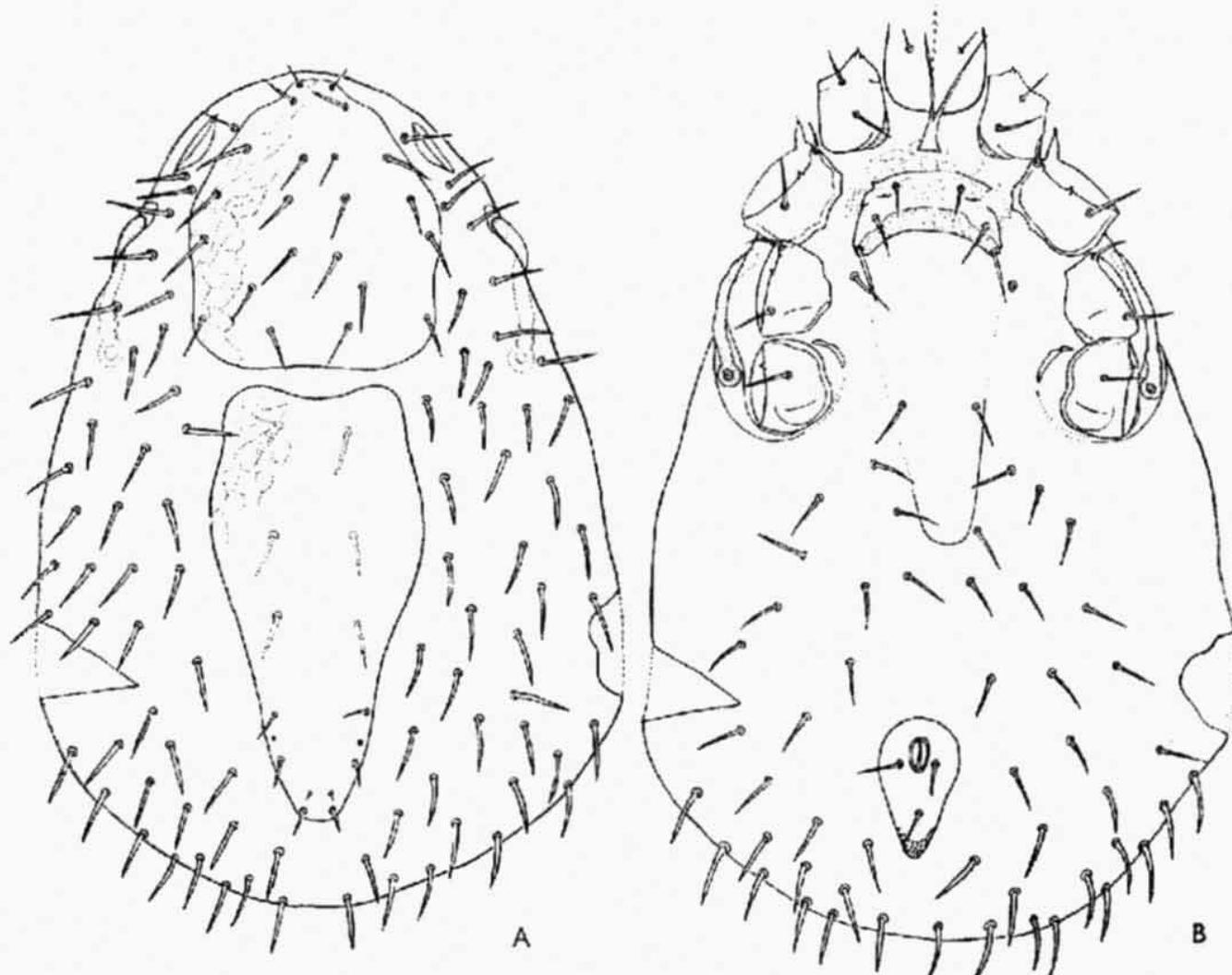


Fig. 4. *Steatonyssus (Steatonyssus) gaisleri* sp. n., female: A — dorsal view, B — ventral view.

102 wide; adanal setae 31, postanal 35 long. Integument bears 20—22 pairs of setae, of which the setae placed anteriorly to anal plate are slender, 36—39 long, the posterior ones thickened, 55—66 long, the caudal setae being the longest. Peritreme originates at the level of centre of coxa IV, not exceeding the level of the anterior margin of coxa III, 45 long. Peritremal platelet exceeds the peritreme on both ends, interrupted dorsally, with separated part at the level of the anterior margin of coxa II.

Gnathosoma: 9 deutosternal teeth developed and arranged in a single file. **Palptrochanter** with ventral chitinized projection. **Gnathosomal setae** broken, **hypostomal setae** 29 and 13 long. **Digitus fixus** 43, **digitus mobilis** 39 long.

Legs: Chaetotaxy typical for the genus. Tibia I 102 long, tarsus I 164, tarsus II 149, tarsus III 151, tarsus IV 184 long. Anterior spur on coxa II tapering to a sharp tip.

Male (Allotype): Idiosoma 600 long, 464 wide.

Dorsum (Fig. 5 A): Dorsal armature divided as in female. Propodosomal plate in median line 225 long, 231 wide, with 11 pairs of setae. Lateral setae 32—37 long; submedial setae 23—35 long, the shortest being V (23), the longest D1 (35).

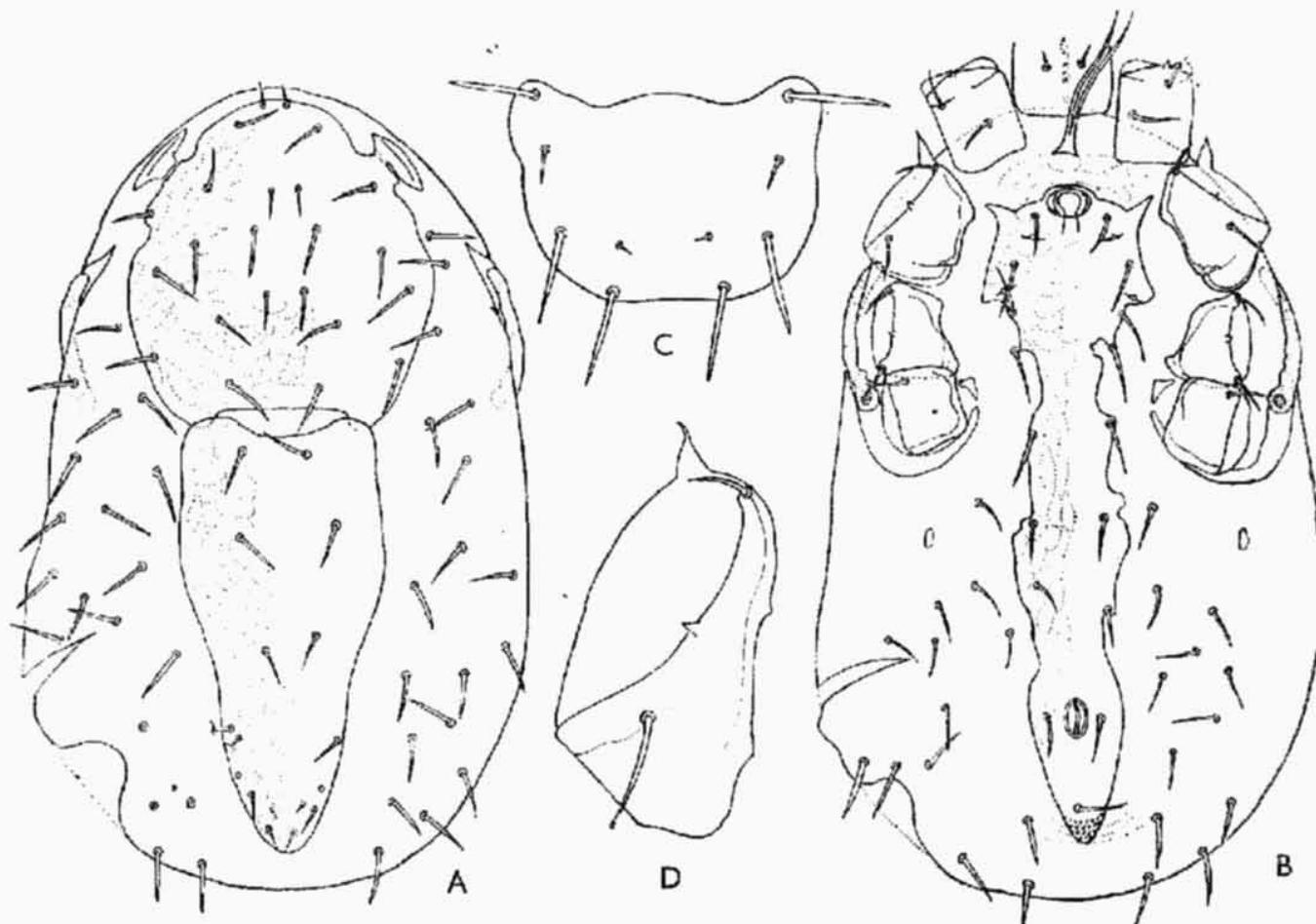


Fig. 5. *Steatonyssus (Steatonyssus) gaisleri* sp. n.: A — dorsal view of male, B — ventral view of male, C — pygidial plate of protonymph, D — coxa II of protonymph.

Opisthosomal plate with a deep concave anterior margin, in median line 308 long, 149 wide (at the level of D1). Three pairs of submedial setae (series D) 27—31 long, subterminal minute setae only 9 long. Uncovered integument bears 18—20 pairs of weakly thickened setae 36—42 long.

Venter (Fig. 5 B): Tritosternal lacinia smooth. Holoventral plate undivided, relatively narrow, with irregular margins, 492 long, at the level of posterior cornua 127 wide. It bears 7 pairs of setae (28—35), a pair of adanal setae (28) and unpaired postanal seta (27). Beyond coxa IV a pair of small rounded platelets developed. Integument covered with 12—13 pairs of setae, of which the setae placed anteriorly to anal pore are slender, 25—29 long, the posterior ones thickened, 25—43 long.

Peritreme reaching the level of posterior margin of coxa II, 106 long. Peritremal platelet exceeding the peritreme, divided, with a separate leafy part attached to propodosomal plate.

Gnathosoma: 9 deutosternal teeth developed in a single file. Palptrochanter without ventrolateral projection. Gnathosomal setae 17 long, hypostomal ones 18 and 4 long. Digitus fixus 32 long, digitus mobilis 42, spermatodactyl 31 long.

Legs: As in female. Anterior spur on coxa II tapering to a sharp point as in female. Anterior seta on coxa III normal, setiform. The seta on coxa IV placed on anterior margin of coxa. Tarsus I 117, tarsus II 98, tarsus III 98, tarsus IV 125 long.

Protonymph: Idiosoma 387—562 long, 242—319 wide.

Dorsum: Propodosomal plate 172—180 long, 160—168 wide, with 11 pairs of setae, the interior being only slightly shorter (24—28) than lateral ones (35—40). Pygidial plate with weakly concave anterior margin (Fig. 5 C), in median axis 70—72 long, 109—121 wide, with 3 pairs of strong marginal setae (32—43), a pair of very fine subterminal setae (7) and a pair of fine additional setae between the first and second pair of marginal setae, 17 long. These setae, however, are absent in some paratype specimens, or only a single seta of this pair is developed. Integument is covered with 14 pairs of stout setae (39—43).

Venter: Sternal plate 110—123 long, 90—115 wide, St1—St3 are 32—39 long. Anal plate 67—70 long, 55—63 wide. Anal setae 23, postanal seta 27 long. Peritreme 70 long. Integument covered with 6 pairs of setae (31—39), the anterior ones being slender and shorter, the posterior ones stouter and longer.

Gnathosoma: Gnathosomal and hypostomal setae about the same length (12—15). Palptrochanter without ventrolateral projection.

Legs: Coxal setae normal, setiform. Anterior spur on coxa II abruptly tapering to a sharp point (Fig. 5 D).

The new species may be characterized by the unusual length of opisthosomal plate in female, exceeding 400 μ , which fact is unknown in any heretofore described species of the subgenus *Steatonyssus*, and by the division of dorsal plate in male. This feature occurs in the members of the subgenus *Steatonyssus* only in *S. mongolicus* Dusb., 1966 and *S. superans* Zemskaya, 1951, also described from Asia, so that it appears to be characteristic for endemic Asian species. But in *S. mongolicus* and *S. superans* the length of opisthosomal plate does not exceed 400 μ in female, and 300 μ in male, as evident with *S. gaisleri* sp. n. Moreover, in males of *S. superans* the holoventral plate is divided into three parts, while in *S. gaisleri* sp. n. it is whole. Posterolateral setae on opisthosomal plate in female of *S. mongolicus* are dissimilar, the median pair (M10) being visibly longer than the remaining two pairs, while in *S. gaisleri* sp. n. all three pairs of posterolateral setae are equal and relatively long. Protonymph of the new species may be characterized by the presence of additional setae on pygidial plate and by the shape of this plate. Additional setae

on pygidial plate of *S. superans* are undeveloped and the first pair of lateral setae on this plate is visibly shorter. Protonymph of *S. mongolicus* described by DUS-BÁBEK (1966) apparently does not belong to the genus *Steatonyssus*, but probably to the genus *Cryptonyssus* and therefore I dismiss its comparison with the new species. In order to differentiate *S. gaisleri* sp.n. from other oriental species, such as *S. longispinosus* Wang, 1960, *S. hsui* Li 1965, *S. dalianensis* Li 1965 etc., the unusual length of opisthosomal plate in female of the new species is a sufficient feature.

10. *Androlaelaps casalis casalis* (Berl.)

Iphis casalis Berlese, 1887—Acari, Myr. Scorp. Ital., fasc. 38, No. 8, figs. 3–5.

Material: 1♀ 1 protonymph from *Pipistrellus pipistrellus* (Schreb.), Kunduz, 5. 9. 1965, lgt. M. Daniel.

A cosmopolitan species, occurring in nests of birds, less often on rodents and in their nests. The subspecies *myrmecophila* Evans et Till, 1966 was described from ant hills in Great Britain. ZHOVTYI et al. (1962) found this species in shelters of bats of the species *Vespertilio murinus* (L.) in the Transbaikal region of the USSR. Findings of this species on bats or in their shelters must be regarded as purely accidental.

11. *Argas (Carios) vespertilionis* (Latr.)

Carios vespertilionis Latreille, 1802—Hist. Natur., Génér. particul. crust. insect. (etc.) vol. 3 : 67.

Material: 2 nymphs, 2 larvae from *Pipistrellus pipistrellus* (Schreb.), Kunduz, 4. 9. 1965; 3♀ 15 larvae from the same host and locality, 5. 9. 1965, all lgt. M. Daniel; 1 larva from *Myotis longipes* (Dobson), Jalalabad, 18. 3. 1967; 6 larvae from *Scotophilus heathi* (Horsfield), Jalalabad, 30. 3. 1967; 2 larvae from *Eptesicus nasutus* (Dobson), Bisut, 7. 4. 1967; 23 larvae from the same host and locality, 9.–10. 4. 1967; 2 larvae from *Scotophilus heathi* (Horsfield), Jalalabad, 8. 4. 1967; 7 larvae from the same host and locality, 22. 4. 1967; 28 larvae from *Eptesicus serotinus* (Schreb.), Jalalabad, 13. 4. 1967; 1 larva from *Scotophilus heathi* (Horsfield), Jalalabad, 25. 4. 1967; 8 larvae from *Eptesicus serotinus* (Schreb.), Jalalabad, 26. 4. 1967; 2 larvae from *Pipistrellus coromandra* (Gray) (?), Jalalabad, 29.–30. 4. 1967, all lgt. Gaisler, Povolný, Šebek, Tenora.

This species is common throughout the Old World, reaching as far as the Indomalayan and Australian regions. It parasitizes many bat species inhabiting caves, hollow trees and attics of dwellings. It has been reported from Afghanistan by LINDBERG (1961) who found it in the cave Kouh-Kvadjah, district of Naouzar, north of Guerech.

12. *Argas (Chiropterargas) boueti* Roubaud et Colas-Belcour

Argas boueti Roubaud et Colas-Belcour, 1933 Parasitology 25, 4:472.

Material: 34 larvae from *Rhinopoma hardickei* Gray, Chaknaur, 7. 4. 1967; 7 larvae from *Rhinopoma microphyllum* (Brünnich) from the same data and locality, all lgt. Gaisler, Povolný, Šebek, Tenora.

A species distributed throughout the African continent, reaching as far as the Near and Middle East. HOOGSTRAAL (1954) reports it from Palestine, NEMENZ (1960) also from Afghanistan, from the

cave Chamchir ghar, Pandjavai, near Kandahar. Most findings originate from members of the super-families Emballonuroidea and Rhinolophoidea, but findings are also known from the genera *Eptesicus*, *Tadarida* and others.

13. *Argas (Secretargas) transgariepinus* White

Argas transgariepinus White, 1846 in: Methuen H.H., Life in the wilderness, or wandering in South Africa, London: 318.

Material: 4 larvae from *Eptesicus serotinus* (Schreb.), Jalalabad, 15. 3. 1967, lgt. Gaisler, Povolný, Šebek, Tenora.

The species is primarily distributed in Africa, but has been also found in Spain, France, Italy, Switzerland, Greece, Palestine and Israel (HOOGSTRAAL 1952, 1954, 1957, STARKOFF 1958, THEODOR and COSTA 1960, BEAUCOURNU 1966). It is known so far only from vespertilionid bats, *Pipistrellus savii savii* (Bonap.), *P. nathusii* Keys. et Blas. and *Plecotus auritus* (L.). The findings of this species in Afghanistan are not surprising.

In the territory of Afghanistan another two bat-infesting species of the genus *Argas* were found by LINDBERG during his biospeleological investigations (LINDBERG 1961, 1962). TRAVASSOS SANTOS DIAS (1961) reports the species *Argas (Chiropterargas) afghanistaniensis* Travassos Santos Dias, 1961 from *Rhinopoma microphyllum* (Brünnich), found in the cave Kouh-Kvadjah Largar, district of Naouzar, north of Guerechk and in the cave Chamchir ghar, near Pandjavai. NEMENZ (1960) determined the species *Argas (Chiropterargas) confusus* Hoogstraal, 1955 also from the cave Kouh-Kvadjah Largar, but after MOREL (1964) both these species are identical.

14. *Ixodes (Eschatocephalus) vespertilionis* C. L. Koch

Ixodes vespertilionis C. L. Koch, 1844 Arch. Naturgesch. 10 J, 1:217.

Material: 2 nymphs from *Rhinolophus hipposideros* (Bechst.), Sorobi, 5. 4. 1967, lgt. Gaisler, Povolný, Šebek, Tenora.

This species is known from the Eurasian continent and Africa, its distribution reaching as far as Japan (HOOGSTRAAL 1956). It has been reported from Palestine by ARTHUR (1956), from Israel and south-Asian republics of the USSR by OLENEV (1927, 1931) and POMERANTZEV (1937, 1950). It was collected in Afghanistan by Lindberg, in the cave Zarmat, Gouvernement de Maimaneh, in the cave Kham Zindar, near Darrelo Chakh, region of Belchiragh, from *Rhinolophus ferrumequinum irani* (Cheesman) (LINDBERG 1961, TRAVASSOS SANTOS DIAS 1961) and in the cave Chamchir near Kandahar (BEAUCOURNU 1966). Many host species of bats of various families are known in literature, but the most often mentioned are members of the genus *Rhinolophus*.

15. *Haemaphysalis (Haemaphysalis) erinacei* Pavesi

Haemaphysalis erinacei Pavesi, 1884—Ann. Mus. Genos 20 :484.

Material: 1 larva from *Pipistrellus pipistrellus* (Schreb.), Kunduz, 4. 9. 1965, lgt. M. Daniel.

This species is distributed in the Mediterranean region, i.e. North Africa, Southern Europe and the Near and Middle East. From Afghanistan it has been reported by ANASTOS (1954—after NEMENZ 1960, as *H. numidiana* Neumann, 1905). The tick feeds on small mammals inhabiting burrows or frequenting caves. MOROZOVA et al. (1964) found one larva on *Nyctalus noctula* (Schreb.) and one

nymph feeding on *Pipistrellus pipistrellus* (Schreb.) in the Kazakh SSR (as *H. numidiana* Neumann, 1905). Because this tick reveals an affinity to insectivores and rodents, its findings on bats must be regarded as accidental and exceptional.

16. *Audytrombicula (Audytrombicula) taumasia* Vercammen—Grandjean

Audytrombicula taumasia Vercammen—Grandjean, 1963—Acarologia 5, 4:603

Material: 4 larvae from *Rhinopoma hardwickei* Gray, Chaknaur, 7. 4. 1965; 14 larvae from the same host, Darunta, 12. 4. 1967; 1 larva from *Miniopterus schreibersi* (Kuhl), Jalalabad, 3. 5. 1967, all lgt. Gaisler, Povolný, Šebek, Tenora.

The species is known so far only from Afghanistan and has been described from *Rhinopoma hardwickei scianum* Thomas, found in the cave Chamehir near Kandahar. In this case the host was probably *R. h. hardwickei* Gray.

17. *Sasatrombicula (Traubiella) multisternalae* (Vercammen—Grandjean)

Eltonella (Chiroptella) multisternalae Vercammen—Grandjean, 1963—Acarologia 5, 4:596.

Material: 1 larva from *Rhinopoma hardwickei* Gray, Chaknaur, 7. 4. 1967; 16 larvae from the same host, Darunta, 12. 4. 1967, lgt. Gaisler, Povolný, Šebek, Tenora.

This species has also been described from Afghanistan from *Rhinopoma microphyllum microphyllum* (Brünnich) found in the cave Kvadjah Largar, Guerech, district of Naouzar. Heretofore it has been known only from the type collection.

18. *Chiroptella (Oudemansidium) muscae* (Oudemans).

Allothrombidium muscae Oudemans, 1906—Ent. Ber., Amsterdam 2, 27:43.

Material: 1 larva from *Rhinopoma hardwickei* Gray, Chaknaur, 7. 4. 1967; 1 larva from *Scotophilus heathi* (Horsfield), Jalalabad, 8. 4. 1967, all lgt. Gaisler, Povolný, Šebek, Tenora.

This species has been known only in Europe (France, Netherlands, Czechoslovakia, Austria, Bulgaria), where it parasitizes bats of the family Vespertilionidae. In Asia another species of the subgenus *Oudemansidium*, *Ch. (O.) subakamushi* (Schluger, 1948) has been described from *Eptesicus serotinus* (Schreb.). This species, however, has been recently synonymized with *Ch. (O.) muscae* by TAMYIA TAKEO (1962). Our findings of *Ch. (O.) muscae* in Afghanistan confirm this synonymy.

VERCAMMEN—GRANDJEAN (1963) reported from the territory of Afghanistan another 11 species of the family Trombiculidae, parasitic on bats, which have not been included in our collection. They are the following species:*) *Leptotrombidium (Ericotrombidium) aelleni* V.—G., 1963 from *Rhinolophus ferrumequinum irani* Cheesman, from the cave Khou Zindar, Beltchiragh; *L. (E.) plecoti* V.—G., 1963 from *Plecotus wardi wardi* Thomas (= *P. austriacus* (Fischer)) from the cave Mont Qoul Kharideh, west of Kabul and Kvadjah gar, near Mazanah, Shourbaud Valley; *Myotrombicula (Myotrombicula) olosa* V.—G., 1963 from *Rhinolophus ferrumequinum irani* Cheesman and *R. hipposideros midas* Andersen, fortress Qual'ch Bost, southwest of Guerech and from the cave Boulan, Qalat; *M. (M.) aselliae* V.—G., 1963 from *Asellia tridens murraiana* (Andersen), the cave Kouh-Dozd,

*) Generic and subgeneric combinations of species have been itemized after VERCAMMEN—GRANDJEAN's revision of Trombiculinae of the world (Index List)—unpublished to date.

Dilaram; *M. (M.) megalosa* V.-G., 1963 from *Rhinolophus elivosus bocharicus* Kastschenko et Akimov, the cave Zarmast, Mainaneh; *M. (M.) lindebergi* V.-G., 1963 from *Rhinolophus ferrum-equinum irani* Cheesman, the cave Zindar near Belchiragh; *Sasatrombicula (Rudnickula) rhinopoma* (V.-G., 1963) from *Rhinopoma microphyllum microphyllum* (Brünnich), the cave Moumlai du Kouh-Pir, Farah; *S. (Sasatrombicula) hexasternalae* V.-G., 1963 from *Rhinolophus blasii blasii* Peters and *Rhinolophus hipposideros midas* Andersen from the cave Pialeh, northwest of Jalalabad and from the cave Boulan, Qalat; *Riedlinia (Trombigastia) platypygia* V.-G., 1963 from *Asellia tridens murraiana* (Andersen), the caves Kouh-Dozd, Dilaram and Kouh-Siah Ab, between Dilaram and Farah; *R. (Riedlinia) afghanensis* V.-G., 1963 from *Asellia tridens murraiana* (Andersen) from the caves Kouh-Dozd, Dilaram and Kouh-Siah Ab, between Dilaram and Farah; *Whartonica scarcella* V.-G., 1963 from *Rhinolophus hipposideros midas* Andersen, the cave Boulan, Qalat.

REFERENCES

ALLEN V., Contribution à l'étude de la faune d'Afghanistan 9. Chiroptères. Rev. suisse Zool. 66: 353-386, 1959.

ANASTOS G., The 3rd Danish Expedition to Central Asia. Zoology. Result 12, Ticks (Chelicerata) from Afghanistan. Viedensk. Medd. ser. Dansk. naturh. Foren. 116: 169-174, 1954.

, The ticks (Acarina: Ixodoidea) of the J. Klapperich Afghanistan expedition, 1952 and 1953. J. Wash. Acad. Sci. 46: 18-19, 1956.

ARTHUR D. R., The ixodes ticks of Chiroptera (Ixodoidea, Ixodidae). J. Parasit. 42: 180-196, 1956.

BAKER E. W., DELFINADO M. D., Spinturnicidae of South East Asia and the Pacific Region. Pacific Insects 6: 571-591, 1964.

BEAUCOURNU J. C., Sur quelques Ixodoidea (Acarina) paléarctiques inféodés aux micro-Chiroptères. Ann. Parasit. hum. comp. 41: 495-502, 1966.

COOREMAN J., Contribution à l'étude de la faune d'Afghanistan 28. Acariens recueillis dans le domaine souterrain. Bull. Inst. roy. Sci. nat. Belg. 36: 1-18, 1960.

COSTA M., The present stage of knowledge of Mesostigmatic mites in Israel (Acaria, Mesostigmata). Israel J. Zool. 15: 69-82, 1966.

DOMROW R., Mammals of Innisfail II. Their mite parasites. Austr. J. Zool. 10: 268-306, 1962.

DUSBÁBEK F., A contribution to the knowledge of parasitic mites from Mongolia (Acarina: Gamasidae). Mitt. Zool. Mus., Berlin 42: 43-58, 1966.

EVANS G. O., TILL W. M., Studies on the British Dermanyssidae (Acaria: Mesostigmata). Part 11. Classification. Bull. Brit. Mus. (Nat. Hist.), Zool. 14: 109-370, 1966.

GADZHIEV A. T., DUBOVCHENKO T. A., Fauna of gamasid mites of bats from Azerbaijan. Izv. AN Azerb. SSR 6: 49-54, 1966. (In Russian.)

-, -, Gamasid mites (Parasitiformes, Gamasoidea) of bats from Azerbaijan. Zool. Zhurn. 46: 1716-1719, 1967. (In Russian.)

GAISLER J., POVOLNÝ D., ŠEBEK Z., TENORA F., Faunal and ecological review of mammals occurring in the environs of Jalal-Abad, with notes on further discoveries of mammals in Afghanistan. II. Chiroptera. Zool. listy 17: 41-48, 1968.

HIREGAUDAR L. S., BAL D. V., Ectoparasites of some bats from India. Current Sci. 24: 221-222, 1955.

-, -, Some ectoparasites of bats from India. Agra Univ. J. Res. (Sci.) 5: 1-134, 1956.

HOOGSTRAAL H., Notes on Egyptian ticks (Ixodoidea). I. The genus *Argas* (Argasidae) in the Cairo area. Proc. Egypt. Acad. Sci 7: 114-127, 1952.

-, A preliminary, annotated list of ticks (Ixodoidea) of the Anglo-Egyptian Sudan. J. Parasit. 40: 304-310, 1954.

-, African Ixodoidea I. Ticks of the Sudan. Res. Report. Dept. of Navy: 1-1101, 1956.

-, Bat ticks of the genus *Argas* (Ixodoidea, Argasidae). 2. *Secretargas* new subgenus and *A. transgariepinus* White, 1846, its adult and immature stages; with a definition of the

subgenus *Argas*. Ann. Entomol. Soc. Amer. 50: 544–549, 1957.

LI IN-TSE, Two new species of the genus *Steatonyssus* (*S. hsui* sp. n. and *S. dalianensis* sp. n.) Kolenati (Acarina, Liponyssidae). Acta zootaxon. sinica 2: 349–352, 1965. (In Chinese.)

LINDBERG K., Recherches biospéléologiques en Afghanistan. Lunds. Univ. Arsskrift. N. F. Adv. 2, 57: 1–39, 1961.

—, Recherches biospéléologiques en Afghanistan II. Lunds. Univ. Arsskrift. N. F. Adv. 2, 58: 3–15, 1962.

MEYER-OEHME D., Die Säugetiere Afghanistans. III. Chiroptera. Sciente., Kabul: 42–58, 1965.

MOREL P. C., Les tiques d'Afrique et du bassin Méditerranéen (Ixodoidea). Inst. d'Elev. Med. Vet. Pays Trop. Maison-Alfort (Seine), Lab. Nat. Rech. Vet. Dakar (Senegal): 1–1342, 1964.

MOROZOVA I. V., BIBIKOVA V. A., USHAKOVA G. V., Mites of bats from Kazakhstan. The parasites of the wild animals of Kazakhstan. AN Kaz. SSR, Trudy Inst. Zool. 22: 161–165, 1964. (In Russian.)

NEMENZ H., Contribution à l'étude de la faune d'Afghanistan 18. Ixodoidea: Argasidae. Entomol. Tidskr. Arg. 81: 45–47, 1960.

OLENEV N. O., To the classification and geographical distribution of Ixodidae. C. R. Acad. Sci. U.R.S.S. A (14): 219–224, 1927. (In Russian.)

—, Contribution to the classification and geographical distribution of the ticks (Ixodoidea). V. Mag. Parasit., Moscow 2: 249–261, 1931. (In Russian.)

POMERANTZEV B. I., The parasitological adaptations of ticks, Ixodoidea (Acarina). Bull. Acad. Sci. U. R. S. S., Math. Nat. Sci. 4: 1423 to 1436, 1937. (In Russian.)

—, Ixodidae. In: Fauna of the U.S.S.R. Moscow, 4 (2): 1–224, 1950. (In Russian.)

RADOVSKY F. J., The Macropyssidae and Laelapidae (Acarina: Mesostigmata) parasitic on bats. Univ. Calif. Publ. Entomol. 46: 1–288, 1967.

RUDNICK A., A revision of the mites of the family Spinturnicidae (Acarina). Univ. Calif. Publ. Entomol. 17: 157–284, 1960.

SHULOV A., Additions to the fauna of Acarina of Israel (excluding ticks and gall mites). Bull. Res. Coun. Israel 6 B: 233–238, 1957.

SONENSHINE D. E., CLIFFORD C. M., KOHLS G. M., The identification of larvae of the genus *Argas* (Acarina: Argasidae). Acarologia 4: 193–214, 1962.

STARKOFF O., Ixodoidea d'Italia. Il pensiero scientifico, Roma: 1–385, 1958.

TAMIYA TAKEO, Recent advances in studies of Tsutsugamushi disease in Japan. Med. Cult. inc., Tokyo, Nihonbashi, Chuo-Ku: 1–309, 1962.

THEODOR O., COSTA M., New species and new records of Argasidae from Israel. Observations on the rudimentary scutum and the respiratory system of the larvae of the Argasidae. Parasitology 50: 365–386, 1960.

TILL W. M., EVANS G. O., The genus *Steatonyssus* Kolenati (Acari: Mesostigmata). Bull. Brit. Mus. (Nat. Hist.), Zool. 11: 513–582, 1964.

TRAVASSOS SANTOS DIAS J. A., Sobre una pequeña colección remetida pelo Dr. K. Lindberg. Notas Ixodológicas VII. Mem. Estud. Mus. Zool. Univ. Coimbra 261: 1–16, 1959.

—, Ixodoidea. Contribuição ao estudo da fauna do Afeganistão 30. Mem. Estud. Mus. Zool. Univ. Coimbra 267: 1–18, 1961.

VERCAMPEN-GRANDJEAN P. H., Contribution à l'étude de la faune d'Afghanistan 75. Deux nouvelles espèces de nymphes de Trombiculidae recueillies dans une grotte d'Afghanistan. Acarologia 4: 362–368, 1962.

—, Contribution à l'étude de la faune d'Afghanistan 77. Trombiculidae de Chiroptères. Acarologia 5: 582–615, 1963.

ZIMMERMANN K., Fledermäuse aus Afghanistan. Z. Säuget. 21: 195–196, 1956.

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