SIPHONAPTERA FROM HINDU KUSH*

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Abstract. During two expeditions to the Hindu Kush region, with participation of workers of the Czechoslovak Academy of Sciences, in 1965 (Afghanistan) and 1967 (Pakistan), 750 specimens of 27 species or subspecies of fleas were collected, three of which are described here as new species. Collecting data and some general notes concerning the various taxa are given below.

The First Czechoslovak Hindu Kush Expedition took place from June till September, 1965, with the Wakhan region (in the ‘pan-handle’) as its main aim (Daniel 1966). The parasitologist on these expeditions, Dr M. Daniel, collected amongst others 382 specimens of fleas from 11 different species of hosts (about 200 specimens). The Second Czechoslovak Hindu Kush Expedition lasted from June till August 1967 and explored a Pakistan part of the mountain range (Daniel 1969); 386 fleas were collected from 4 different host species in the Tírich Mir mountains.

While the flea-fauna of most of Afghanistan is of a distinct ponto-mediterranean character, that of the Wakhan as well as the adjoining Tírich Mir mts proved to belong to the montane fauna that occurs in the range encompassing the Gissar Mts, Wakhan, Pamir and the Tyan'-Shan' extending into Sinkiang-Uighur.

COLLECTING LOCALITIES

(listed in west-east order, with enumeration of trapping results)

Afghanistan

Band-i-Amir 34.49 N 67.12 E (a series of small lakes, about 80 km W. of Bamiyan; Bamiyan province) — 26. VI. 1965

16 Ochotona rufescens: 3♂ 7♀ Callopsylla caspia tiblovi, 2♂ Citellophilus tesquorum ssp., 3♂ 2♀ Ctenophyllus rufescens, 2♂ 4♀ Frontopsylla mutata, 1♀ Frontopsylla frontalis alltau, 1♂ Leptopsylla sexdentata.

Bamiyan (or Bamiyan) 34.50 N 67.50 E (Bamiyan province) — 25. VI. 1965

1 Chiropoter (in a cave near small Buddha statue): 0.

1 Nest of Apis apes: 1♀ Ctenaphillus frigillae.

Shibar Pass (or Shebar Kowtal-e) 34.54 N 68.14 E (Parwan province) — 27. VI. 1965

2 Ochotona rufescens: 2♂ 3♀ Callopsylla caspia tiblovi, 1♀ Frontopsylla mutata.

Kotal Pass [† Kowtal, meaning ‘pas’] (just N. of Shibar Pass; Parwan province) — 25. VI. 1965

1 Ochotona roylei: 1♂ 2♀ Ctenophyllus rufescens, 1♂ 2♀ Frontopsylla mutata.

2 Ochotona rufescens: 5♂ Callopsylla caspia tiblovi, 1♂ Citellophilus tesquorum ssp., 1♂ Ctenophyllus rufescens, 2♂ 3♀ Frontopsylla mutata.

Kunduz 36.47 N 68.51 E (Kunduz province) — 4. IX. 1965
6 Chiroptera: 1♂ 12 Ischnopsyllus octacrenus.

Kabul 34.39 N 69.10 E (Kabul province) — 22. VI.—1. VII. 1965
1 Apodemus sylvaticus, 2 Microtus afghanus, 1 Mus musculus, 1 nest of Passer domesticus, 1 Pica pica; all 0.

Feizabad 37.05 N 70.40 E, —1500 m. (Badakhshan province) — 12.—14. VII. 1965
2 Meriones meridianus; 2♂ 3♀ Xenopsylla conspersa conspersa.
1 Meriones persicus; 1♂ 10♀ Xenopsylla conspersa conspersa.
1 Mus musculus; 0; 1 Nesokia indica; 0.

Chap-Darrah 36.53 N 72.21 E, 3700 m. (a valley parallel to the Ishmirk-Darrah, about 6 km S. of Ishmirk; Badakhshan province) — 15.—21. VIII. 1965
16 Allocola argentatus roylei; 1♂ 2♀ Amphipsylla primaris primaris, 6♂ 7♀ Callopsylla caspia fragilis, 1♂ 2♀ Leptopsylla nana, 1♂ Neopsylla pleskei ariana.
7 Marmota caudata; 10♂ 7♀ Citellus philbi lebedevi princeps, 1♀ Ctenophillus conchoae, 1♀ Leptopsylla nana, 1♂ 3♀ Rhadinopsylla li murium.
11 Ochotona roylei; 1♂ Amphalius sp. indet., 4♂ 1♀ Callopsylla danieli, 7♂ 6♀ Ctenophillus conchoae.
3 Birds; 0.

Ishmirk 36.57 N 72.22 E, 2750 m. (Badakhshan province) — 18.—19. VII. 1965
2 Apodemus sylvaticus; 1♂ Callopsylla caspia fragilis, 2♂ Frontopsylla ambigua.
6 Cricetulus migratorius; 1♂ 4♀ Amphipsylla aniceps, 2♀ Callopsylla caspia fragilis, 3♂ 2♀ Leptopsylla nana.

Ishmirk—Darrah 36.50 N 72.25 E, 2850—4000 m. (a valley, about 10 km S.S. of Ishmirk, about 15 km W. of Qala-i-Panj, just to the N.E. of Wakhan; Badakhshan province):
(a) 2850 m. (willow coppice); —22.—27. VII. 1965
22 Allocola argentatus roylei; 27♂ 49♀ Amphipsylla montana, 2♂ 15♀ Amphipsylla primaris primaris, 1♂ 7♀ Callopsylla caspia fragilis, 1♀ Frontopsylla ambigua, 1♂ Frontopsylla protera, 3♂ 2♀ Pararadopsylla arзнак.
11 Apodemus sylvaticus; 2♂ 1♀ Frontopsylla ambigua.
20 Crocidura russula; 1♂ Amphipsylla montana, 1♂ Frontopsylla ambigua, 3♂ 1♀ Leptopsylla sexlineata.
1 Ochotona roylei; 0.
(b) 3800—4000 m. (moraines, grass) —21. VII.—3. VIII. 1965
13 Allocola argentatus roylei; 6♂ 7♀ Amphipsylla montana, 4♂ 4♀ Amphipsylla primaris primaris, 4♂ 3♀ Callopsylla caspia fragilis, 1♂ Xenopsylla chensis.
1 Ochotona roylei; 2♂ Amphalius sp. indet., 3♂ 8♀ Ctenophillus conchoae.
1 Bird; 0.
(c) 4000 m. (grass) —28. VIII. 1965.
1 Ochotona roylei; 1♂ 1♀ Ctenophillus conchoae.

“Shangri-La” 36.51 N 72.28 E, 4550 m. (just to the E. of Ishmirk—Darrah; Badakhshan province) — 8.—11. VIII. 1965
13 Allocola argentatus roylei; 1♂ 1♀ Amphipsylla primaris primaris, 4♂ 5♀ Malaracus penicilliger syr.
1 Bird; 0.

Detailed characteristics of high-mountain biotopes in the Wakhan region where the fleas were collected, are included in the paper of Hadač (1970).

Pakistan

Tirich valley ±36.18 N 71.55 E, 4100 m. (grassy area, some bushes; Tirich Mir mountain, Chitral region) — 29. VII.—22. VII. 1967
19 Allocola argentatus roylei; 3♀ Amphipsylla aniceps, 20♂ 42♀ Amphipsylla montana, 23♂ 20♀ Callopsylla caspia fragilis.
1 Ochotona roylei; 1♂ Ctenophillus conchoae.
6 Birds; 0.

Shajnak (or Shokhmiyak), Tirich valley, 3650 m. (willow, birch, moist meadows) — 25. VII.—12. VIII. 1967
62 Allocola argentatus roylei; 2♂ 1♀ Amphipsylla aniceps, 37♂ 61♀ Amphipsylla montana, 26♂ 61♀ Callopsylla caspia fragilis, 2♂ Frontopsylla ambigua, 1♀ Neopsylla pleskei ariana, 3♂ 3♀ Neopsylla heckeli, 2♂ Rhadinopsylla allicolae.
36 Apodemus sylvaticus; 4♂ 3♀ Amphipsylla montana, 9♂ 9♀ Callopsylla caspia fragilis, 13♂ 17♀ Frontopsylla ambigua.
1 Cricetulus migratorius; 0.
7 Crocidura suaveolens; 1♂ 1♀ Amphipsylla montana, 2♂ 1♀ Frontopsylla ambigua.
4 Birds; 0.
Hystrichopsyllidae

Neopsylla pleskei ariana Ioff, 1946

Chap-Darrah, Allicola argentatus roylei: 1♀.
Shajnak, Tirich valley, Allicola argentatus roylei: 1♂.

Various small mammals appear to be hosts of this flea which occurs in Iran, Tadzhikistan, Turkmenia, Altai, Tyan'-Shan', Kirgizia and Sinkiang Uighur.

Neopsylla heckeli sp. n.

(Figs. 1–4)

Shajnak, 3650 m., Tirich valley, Pakistan, from Allicola argentatus roylei, 27. VII. 1967 (♂ holotype, ♀ allotype and 1♂ paratype), 29. VII. 1967 (1♀ paratype), 8. VIII. 1967 (1♂ paratype), 10. VIII. 1967 (1♂ paratype), leg. M. Daniel. Holotype, allotype and 1♂ 1♀ paratypes in the Parasitological Institute of the Czechoslovak Academy of Sciences, Prague, one pair of paratypes in the British Museum (Natural History).

Diagnosis: A member of the setosa—group of species. Apparently nearest related to N. galea Ioff, 1946, a flea of Gricetulus and Microtus in Transbaykalia and Mongolia. The large size of the basimere distinguishes the male of the new species from that of N. galea and so does e.g. the shape and chaetotaxy of sterna VIII and IX. The female

Fig. 1. Neopsylla heckeli sp.n. Paramere and sternum IX of male, holotype.
differs from that of *N. galea* by the virtual absence of a lateral sinus in the posterior margin of sternum VII.

**Description:** Head: Submarginal frontal row with 5 or 6 setae, ocular row of 3 large setae. The five-unit labial palp reaches to about three-quarters the length of the fore coxa. Setae of antennal pedicel rather short in the male, reaching at most to the basal third of the claval length, while in the female they are longer and extend nearly the apex of the clava. Postantennal region with 3 rows of setae.

Thorax: Pronotum with one row of normally 6 setae per side, preceded dorsally by a few short ones in the male only; pronotal ctenidium with 18 spines (varying from 17—19), the upper spines longer than the dorsal length of the pronotum. Mesonotum with a main row of 6 (or 7) setae per side, mesosternosome with 6 setae; metanotum with a main row of 6 or 7 setae each side, metepisternum with 2, metasternum with one large seta and a minute one above it, metepimeron with 9 or 10 setae.

Legs: None of the setae on the inner side of the hind coxa subspiniform. Hind tibia with 8 notches (including the apical notch) in the dorso-posterior margin, each containing 2 setae except for the antepenultimate notch which has only one, and the apical notch which has three. Longest seta of second hind tarsomere reaching the apex of the third tarsomere in the male, not quite so in the female. Fore and mid distitarsomeres with 5 pairs of lateral plantar setae in the male, 4 or 5 in the female;

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**Figs. 2, 3.** *Neopsylla heckeli* sp.n. (2) Aedeagus of paratype; (3) Sternum VIII of male, holotype.
hind distitarsonsere with 4 pairs. Abdomen: Numbers of setae per side in the main row of terga I—VII, ♂: 6, 8—9, 8—9, 8—9, 8—9 and 6—7 respectively; in the ♀: 5—6, 8, 7—8, 7, 6—7, 2—4. Numbers of marginal spinelets on each side of terga I—IV: 1, 2—3, 1—2, 1. Numbers of setae per side on sterna II—VII, ♂: 1, 3, 3, 3, 3 and 4: ♀ 1, 3—4, 4, 3—4, 4, 5. The outer two of the 3 antensensial setae of equal length in

Fig. 4. *Neopsylla heckelii* sp.n. Terminalia of female, allotype.
the ♂ and about 1/3rd the length of the middle setae; in the ♀ the lower setae is longer and reaches about halfway the length of the middle setae.

Terminalia, male (Figs. 1—3): Tergum VIII with 6—8 short setae. Sternum VIII (Fig. 3) with a hyaline ventro-lateral broadly rounded lobe; chaetotaxy as shown in Fig. 3. Processus basimeris dorsalis separated from the processus basimeris ventralis by a fairly deep and narrow sinus, the former with quite a number of largish setae, the latter with a marginal fringe of very thin setae (Fig. 1). Manubrium strongly upturned. Telomere spindle-shaped, ventrally fused with the basimere; with very thin setae only. Proximal arm of sternum IX broader than distal arm which gradually widens apicad; dorso-apical angle of distal arm drawn out a little, apical margin slightly convex, a row of 5 or 6 spiniform setae along the apical end of the ventral margin, a dense row of 4 flattened and somewhat curved setae laterally near the base of this arm; the dorsal rounded expansion of the distal arm, above the dense group of 4 flattened setae, may be turned down and is then unobtrusive (Fig. 1). Aedeagus as in Fig. 2; aedeagal apodeme fairly narrow; virgac penis not making more than half a convolution.

Female (Fig. 4): Posterior margin of sternum VII with a very small lateral lobe, below which the margin is somewhat convex. Tergum VIII with a semicircular spiracular fossa and markedly angulate in lower half; chaetotaxy as shown in Fig. 4. Anal stylet slightly, but distinctly, curved downwards. Spermaphcica and genital ducts (Fig. 4) not very distinctive, of the for the genus usual pattern.

Remarks: This new species is named in memory of Vilém Heckel, an outstanding photographer of man’s environment, who—with the 14 other members of the Czechoslovak Expedition Peru ’70—was killed by the avalanche which destroyed the villages Yungay and Ranashirca, in the Chimbote region, on 31 May 1970. His beautiful books on the two Hindukush expeditions give excellent photographs of the biotopes where the fleas, dealt with in this paper, were collected.

**Rhadinopsylla (Ralipsylla) li murium Ioff & Tiflov, 1946**

*Chap-Darah, Marmota caudata: 1♂ 3♀.*

According to host these fleas should be *R. li ventricosa* Ioff & Tiflov, 1946 (from Tyau'-Shan’) but on the basis of the outline of sternum VII of the female (the only structural distinguishing character) they should be regarded as belonging to *R. li murium*, which is known from voles in the Gissar and Tyau'-Shan’ mountains. It seems somewhat doubtful whether eventually the two subspecies can be maintained.

**Rhadinopsylla (Actenophthalmus) alticolae sp.n.**

(Figs. 5—7)

Shajnaq, 3650 m., Tirdz valley, Pakistan, from *Alticola argenteus roylei*, 27. VII. 1967 (♂ holotype), 28. VII. 1967 (♂ paratype), leg. M. Daniol. Holotype in the Institute of Parasitology, Czechoslovak Academy of Sciences, Prague, paratype in the British Museum (Natural History).

**Diagnosis:** The affinities of this new species are rather obscure; perhaps it is nearest related to *R. aspalacis* Ioff & Tiflov, 1946 (from Transbaykalia) or *R. pseudodakurica* Sealon, 1950 (West Siberia, Transbaykalia, Mongolia). Sterna VIII and IX of the male are very distinctive for the new species.

**Description:** Head (Fig. 5): Submarginal frontal row with 5 or 6 setae, posterior to this row 2 large setae. Genal ctenidium with 6 spines (5 on one side of the head in the holotype), the uppermost being basally distinctly broader than the other 4 and reaching almost to two-thirds the dorsal length of the penultimate spine. The five-unit
Figs. 5, 6. *Rhadinopsylla alticoiae* sp.n. (5) Head and prothorax of male, paratype; (6) Sterna VIII and IX, and paramere of male, holotype.
Labial palp reaches to about two-thirds the length of the fore coxa. Setae of antennal pedicle very short, reaching at most to the second claval flagellomere. Postantennal region of head with three developed rows of setae.

Thorax (Figs. 5, 7): Pronotum (Fig. 5) with one row of 6 setae each side; pronotal eugenidium consisting of 22 spines, the upper spines longer than the dorsal length of the pronotum. Mesonotum with a main row of 5 setae each side, mesosternosome with 4 or 5 setae; metanotum with a main row of 5 setae per side, metepisternum with 2 or 3 setae, metasternum with 2 and metepimeron with 4 setae. Suture between collar of metanotum and dorso-anterior part of metepimeron quite well-developed (Fig. 7).

Legs: No lateral setae on inner surface of hind femur and tibia. Longest seta of second hind tarsomere extending to about the middle of the fourth. Distitarsomere with 4 pairs of lateral plantar setae.

Abdomen: Numbers of setae per side in the main row of terga I—VII, ♂: 5, 6 or 7, 6, 6, 6, 6 and 5 respectively. Numbers of spinelets at each side of the posterior margin of terga I—VI, ♂: 3, 2 or 3, 2, 1 or 2, 1 and 1 or 0 respectively. Numbers of setae per side on sterna II—VII, ♂: 1, 2, 2 or 3, 2, 2 or 3, 2 or 3.

Terminalia, male (Fig. 6): Tergum VIII without setae. Sternum VIII with a very prominent lateral lobe and a group of 6 very long setae, 5 of which marginal just below the lobe, and ventrally a smaller seta. Basimere with a broadly rounded dorso-apical angle; acetabular seta placed quite low. Telomere slightly curved in lower half and gradually narrowing towards the apex, the denticulus is situated below the middle of the anterior margin. Distal arm of sternum IX fairly narrow, about 4.5 times as long as broad, dorsal margin apically slanting; setose for most of its length, see Fig. 6. Sensillum with 13 trichobothria each side. Phallosome not very distinctive, more or less as in other species of the genus.

Female: unknown.

Fig. 7. *Rhadinopsylla alticolae* sp.n. Metathorax of male, holotype.
Leptopsyllidae

Leptopsyllinae

Leptopsylla (Leptopsylla) nana Argyropulo, 1946

Ishmurkh, *Cricetulus migratorius*: 3♂ 7♀.

A flea of small montane mammals, found in the Caucasus, Tadzhikistan (Pamir), Kirgizia, Kazakhstan, Mongolia and Sinkiang-Uighur.

Leptopsylla (Leptopsylla) sexdentata (Wagner, 1930)

Ishmurkh-Darrah (a), *Crocidura russula*: 3♂ 1♀.

Associated with small rodents and insectivores in mountains of Caucasus, Uzbekistan, Tadzhikistan, Turkmenia, Dagestan, Kirgizia, Kazakhstan and Dzungariya (China).

Amphipsyllinae

Amphipsylla aniceps Wagner, 1930

Tirich valley, *Alticola argentatus roylei*: 3♀

In Afghanistan hitherto known from the Unai Pass ex *Cricetulus migratorius* and *Blanfordmys afghanus* (Peus 1966: 141, 143). This specific flea of *Cricetulus migratorius* is widely distributed in the mountains of Asia, from Afghanistan in the west to Altai and Tsinghai (China) in the east.

Amphipsylla montana Argyropulo, 1946

Ishmurkh—Darrah (a), *Alticola argentatus roylei*: 27♂ 40♀; *Crocidura russula*: 1♂.
Ishmurkh—Darrah (b), *Alticola argentatus roylei*: 6♂ 7♀.
Tirich valley, *Alticola argentatus roylei*: 20♂ 42♀.
Shajnak, Tirich valley, *Alticola argentatus roylei*: 37♂ 61♀; *Apodemus sylvaticus*: 4♂ 3♀; *Crocidura suaveolens*: 1♂ 1♀.

As is evident from above data, this is a very common flea of *Alticola argentatus*, found in mountains of Tyân-Shân', Pamir and Gissar. Already recorded from Afghanistan (Unai Pass, Salang Pass and Paghman mts) by Peus (1966: 143).

Amphipsylla primaria primaria Jordan & Rothschild, 1915

Ishmurkh—Darrah (a), *Alticola argentatus roylei*: 2♂ 15♀.
Ishmurkh—Darrah (b), *Alticola argentatus roylei*: 4♂ 4♀.
Shangri—La, *Alticola argentatus roylei*: 1♂ 1♀.

Contrary to above records, this is apparently not a very specific flea of *Alticola* because it has actually been found on quite a variety of rodents in the mountains of Tyân’-Shân’ and Pamir.
Ctenophyllum (Conothobius) conothoae Ioff, 1946

Chap—Darrah, Ochotona roylei: 7♂ 6♀; Marmota caulata: 1♀.
Ishmurk—Darrah (b), Ochotona roylei: 8♂ 8♀.
Ishmurk—Darrah (c), Ochotona roylei: 1♂ 1♀.
Tirich valley, Ochotona roylei: 1♂.

Like the other species of Ctenophyllum, this is a specific parasite of Ochotona; hitherto known from Tyian'-Shan' and the Gissar mountains.

Fig. 8. Ctenophyllum rufescens Ioff. Apex of ductus obturatus of six females.

Fig. 9. Frontopsylla mutata Jordan. Outlines of sternum VII of females (Kotal Pass).
Ctenophyllus (Ctenophyllus) rufescens Ioff, 1946

Band-i-Amir, Ochotona rufescens: 3♂ 2♀.
Kotal Pass, Ochotona roylei: 15♀; Ochotona rufescens: 1♂.

This species was known from the Unai Pass in Afghanistan (Peus 1966: 143) and from the Kopet-Dag Mts in Turkmenia where it occurs on Ochotona rufescens.

A number of the females recorded above show an interesting structural peculiarity: the apex of the ductus obturatorius is dilated and sclerotized in varying degrees (Fig. 8a—f), which seems indicative of a vestigial second spermatheca.

Frontopsylla (Frontopsylla) mutata Jordan, 1944

Shibar Pass, Ochotona rufescens: 1♀ (topotype).
Kotal Pass, Ochotona roylei: 1♂ 5♀; Ochotona rufescens: 2♂ 3♀.

This is presumably not a specific flea of Ochotona, which happened to be the only host collected in the three localities listed above; apparently normally associated with

Fig. 10. Frontopsylla ambigu Fedina. Sterna VIII and IX, and paramere of male (Ishmurkh—Darrah).
rodents. Only known from Afghanistan where it had previously been collected from the Shibar Pass (Jordan 1944: 362) as well as from the Unai Pass (Peus 1966: 141).

The outline of the posterior margin of sternum VII of the female proves to be quite variable as is shown in Fig. 9a–f.

**Frontopsylla (Orfrontia) frontalis alatau Fedina, 1946**


This bird-flea, not infrequently associated with burrowing mammals, has a wide distribution and is known from the Caucasus, Uzbekistan, Turkmenia, Kirgizia, Kazakhstan, Ty'an'-Shan' and Sinkiang-Uighur (China). Already recorded from Afghanistan (Unai Pass, ex *Montifringilla theresae*) by Peus (1966: 141). As remarked by Hopkins & Rothschild (1971: 366), the distribution of various subspecies of *F. frontalis* is—on present evidence—very puzzling and much collecting and study remains to be done.

**Frontopsylla (Profrontia) ambiguia Fedina, 1946**

*(Fig. 10)*


Ishmurkh—Darrah (a), *Alticola argentatus roylei*: 1♀; *Apodemus sylvaticus*: 2♂ 1♀; *Crocidura russula*: 1♂.

Shajnak, Tirich valley. *Alticola argentatus roylei*: 2♀; *Apodemus sylvaticus*: 13♂ 17♀; *Crocidura suaveolens*: 2♂ 1♀.

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**Fig. 11. Frontopsylla protera Wagner. Sterna VIII and IX, and paramere of male (Ishmurkh—Darrah).**

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A flea of small mammals, also in mountains of Tadzhikistan (Gissar mts, Pamir), Kirgiziya, Kazakhstan and Sinkiang-Uighur (China).

As no detailed illustration has yet been published of the male modified abdominal segments, they are shown here in Fig. 10; the presence of a hirsute lobe on the inner lateral surface of sternum VIII is noteworthy.

**Frontopsylla (Profrontia) protera Wagner, 1933**

Ishmurkh—Darrah (a), *Alticola argintatus roylei*: 1♂.

A specific flea of voles living at high altitude (*Alticola*), known from mountains of Uzbekistan, Pamir, Kirgiziya and Tyau'-Shan'.

As was the case with the preceding species, the male modified abdominal segments have not been illustrated yet in detail; they are shown here in Fig. 11.

**Paradoxopsyllus naryni Wagner, 1928**

Ishmurkh (a), *Alticola argintatus roylei*: 3♂ 2♀.

A flea of small mammals in Pamir and Tyau'-Shan'.

**Ischnopsyllidae**

**Ischnopsyllus octactenus** *(Kolenati, 1856)*

Kunduz, bat.: 1♂ 1♀.

A specific parasite of *Pipistrellus pipistrellus* throughout Europe and eastwards to central Asia. Peus (1957: 605) recorded it from the true host taken in Afghan Nuristan.

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*Fig. 12. Ampholius* sp. Sternum VII and spermatheca (Ishmurkh—Darrah).
Ceratophyllidae

Amphalus sp. indet. (Fig. 12)

Chap—Darrah, Ochotona roylei: 1♀.
Ishmurkh—Darrah (b), Ochotona roylei: 2♀.

In the absence of males it is not possible to determine these specimens with any certainty. They appear to be nearest related to A. clarus (Jordan & Rothschild, 1922) which, in the female, has a less strongly developed lower lobe of sternum VII and a more slender hilla of the spermatheca than in any of the three females listed above (Fig. 12). A. clarus is known from Tibet, Kazakhstan, East Kirgizia and Tadzhikistan from Ochotona macrotis and O. rutita. The species of Amphalus are parasites of Ochotona in Asia and North America.

Callopsylla (Callopsylla) caspia fragilis (Mikulin, 1953) (Fig. 13)

Ishmurkh, Apodemus sylvaticus: 1♀; Orictolagus migratorius: 2♀.
Ishmurkh—Darrah (a), Alticola argentatus roylei: 1♂ 7♀.
Ishmurkh—Darrah (b), Alticola argentatus roylei: 4♂ 3♀.
Tirich valley, Alticola argentatus roylei: 23♂ 20♀.
Shajnakh, Tirich valley, Alticola argentatus roylei: 26♂ 31♀; Apodemus sylvaticus: 9♂ 9♀.

As confirmed by above records, this is mainly a flea of Alticola, known from central Kazakhstan and Sinkiang-Uighur while Ioff, Mikulin & Scalon (1965: 81) state that apparently slightly different specimens were obtained from eastern Pamir — those would very likely be identical with the Hindu Kush specimens. The northern and southern populations are, on present evidence, indeed well separated (Fig. 13).

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Fig. 13. Map showing the distribution of the four subspecies of Callopsylla caspia Ioff & Argyropulo.
Callopsylla (Callopsylla) caspia tiflovi Wagner, 1936

Band-i-Amir, Ochotona rufescens: 3♂ 7♀.
Shibar Pass, Ochotona rufescens: 2♂ 3♀.
Kotal Pass, Ochotona rufescens: 5♀.

A comparison with the holotype of C. alticola (Jordan, 1944), from the Shibar Pass, with above listed topotypes and with the ♂ lectotype, ♀ toptype and ♀ paralectotype of C. tiflovi Wagner, 1936 (from the Gaudan Pass on the Iranian frontier, Turkmenia) revealed no differences. Citellophilus alticola Jordan, 1944, is herewith placed as a synonym of Callopsylla tiflovi Wagner, 1936 (syn. nov.)

The distribution of this species is shown in Fig. 13, together with that of the three closely related taxa. Mikulin (1957: 83) suggested that these forms may possibly be regarded as subspecies. The zoogeographical pattern resembles that of the subspecies of Ophthalmopsylla volgensis and in analogy we may accept Mikulin's suggestion and reduce the four species to subspecies of Callopsylla caspia: C. caspia caspia (Ioff & Argyropulo, 1934), C. caspia tiflovi Wagner, 1936, C. caspia gaiskii (Vovkheinskaya, 1950) and C. caspia fragilis (Mikulin, 1953).

C. caspia tiflovi is a parasite of Ochotona rufescens, also occurring on other rock-inhabiting mammals, in the mountains of Iran, Kopet-Dag and the Bol'shoy Balkhan.

Callopsylla (Callopsylla) danieli sp. n. (Figs. 14—16)


Diagnosis: Apparently nearest related to C. koszlovi (Wagner, 1928) from Tibet (known from a single male) and differing by details of the genitalia.

Description: Head: Of the frontal row of setae only the dorsal one, near the antennal fossa, is present. Ocular row of 3 setae. The five-unit labial palp reaches the apex of the fore coxa. Setae of antennal pedicel extending to half or two-thirds the length of the clava in the male, in the female to just beyond the claval apex. Postantennal region of head with one large seta above the middle of the antennal fossa, and with the usual posterior row.

Thorax: Pronotum with one row of 5 or 6 setae each side; pronotal eutelidium consisting of 20—22 spines, the dorsal ones of which are of approximately the same length as the pronotum. Mesonotum with a main row of 5 setae per side, mesosternosome with 6—7 setae and several small ones anteriorly. Metanotum with a main row of 5 setae, metepisternum with 3 setae, metasternum with one and metepimeron with 4—6 setae.

Legs: Hind tibia with 8 notches (including the apical one) in the dorso-posterior margin, containing (from base to apex) 2, 2, 1, 2, 2, 1 and 3 setae respectively. Longest seta of second hind tarsomere not quite reaching apex of third tarsomere. Distitarsomere of all legs with 5 pairs of lateral plantar setae.

Abdomen: Numbers of setae per side in the main row of terga I—VII, ♀: 5, 7, 7, 7, 7, 6 and 7 respectively, in the ♀: 4, 7, 7, 6 or 7, 6 or 7, 6 or 7 and 6 or 7. Numbers of marginal spinules on each side of metanotum and terga I—IV, ♀: 2, 2 or 3, 2 or 3, 2 and 1; ♀: 2, 2, 2, 1 and 1 or 0. Numbers of setae per side on sterna II—VII, ♀: 1, 2 or 3, 3 or 2, 3, 3 and 3 or 4; in ♀: 1, 3 or 4, 4, 4, 4 and 8.
Terminalia, male (Figs. 14, 15): Tergum VIII (Fig. 15) with a very narrow marginal area spiculosa, a few small setae antero-dorsad of the spiracular fossa and about a dozen large setae as shown in the figure. Sternum VIII (Fig. 14) narrow, with two long preapical setae and one shorter apical one each side; vexillum large, the apical half spiculose and with a ventro-apical spiculose process. Processus basimeris fairly narrow, the middle of its posterior margin distinctly angulate; manubrium straight and of medium width. Telomere with a wide dorsal half, then abruptly and markedly narrowing; with 2 short and blunt spiniforms near the rounded dorso-posterior angle; other features of chaetotaxy as shown in Fig. 14. Proximal arm of sternum IX narrow and straight; ventral margin of anterior part of distal arm not strongly bulging, with a fringe of stout setae; posterior part of distal arm ellipsoid, chaetotaxy as shown in the figure. Aedeagal hamulus with a ventro-posterior rounded projection; aedeagial apodeme fairly broad, with an apical appendage. Virgae penis not quite making half a convolution.
Female (Fig. 16): Posterior margin of sternum VII forming a smoothly convex lobe with a marked upper angle but without any indication of a lateral sinus. Spermatoceae and genital ducts of the for the subgenus usual pattern. In other respects the female is not strikingly different from that of related species.

Remarks: This new flea, presumably a parasite of Ochotona at high altitudes, is named in honour of Dr. Milan Daniel, accomplished parasitologist and mountaineer, who collected fleas and other parasites during the two Hindu Kush expeditions—certainly no sinecure. Through his splendid efforts we now have some idea of the flea fauna of especially the extremely inaccessible Wakhan region of the Hindu Kush range.

Figs. 15, 16. Cullopsylla danieli sp.n. (15) Tergum VIII of male, holotype; (16) Sternum VII and spermatoceae of female, allotype.

Ceratophyllus fringillae (Walker, 1856)

Bamiyan, nest of Apus apus: 19.

This bird-flea had already been recorded from Afghanistan (Darreh Zang and Qadoes) by Smit (1960: 147).

Citellophilus lebedewi princeps (Ioff, 1946)

Chap—Darreh, Marmota caudata: 195 72.

A specific parasite of Marmota caudata and M. baibacina in mountains of Tadzhikistan, western Tyan’-Shan’ and Sinkiang-Uighur (China).
Citellophilus tesquorum ssp. indet.

Band-i-Amir, Ochotona rufescens: 2♂.
Kotal Pass, Ochotona roylei: 1♀.

The occurrence of these specimens on Ochotona is very likely accidental as the subspecies of C. tesquorum are parasites of Citellus and occur in steppes from Ukraine in the west to China in the east.

Malaraeus (Amalaraeus) penicilliger syrt (Ioff, 1946)

Shangri-La, Alticola argentatus roylei: 4♂ 5♀.

A flea of voles living at high altitudes and known from the Gissar mountains and Pamir, and from the high-mountain syrts of Tyan'-Shan'.

Pulicidae

Xenopsylla conformis conformis (Wagner, 1903)

Faizabad, Meriones meridianus: 2♂ 3♀; Meriones persicus: 1♂ 10♀.

A specific parasite of Meriones, found in S.E. Russia, Caucasus, Turkmenia, Uzbekistan, Tadzhikistan, Kazakhstan, Kirgizia and Inner Mongolia. Already recorded from Afghanistan by Jordan (1944: 360) and Peus (1966: 143) One of the females listed above possesses an additional small spermatheca.

Xenopsylla cheopis (Rothschild, 1903)

Ishmurkhn—Darrah (b), Alticola argentatus roylei: 1♀.

The occurrence of the well-known plague flea on Alticola at an altitude of 3900 m is surprising and may not easily be explained.

REFERENCES


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