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THE EVIPHIDID MITES (ACARINA: MESOSTIGMATA; EVIPHIDIDAE) ASSOCIATED WITH SCARABAEID AND CARRION BEETLES (COLEOPTERA: SCARABAEIDAE, SILPHIDAE) IN CENTRAL EUROPE.

BY Peter MAŠAN *

ABSTRACT: Two genera (Scamaphis Karg, Scarabacariphis gen.n.) and six species of the family Eviphididae Berl. (Scamaphis equestris (Berl.), Scarabacariphis grandisternalis sp.n., Alliphis necrophilus Christ., Alliphis phoreticus sp.n., Alliphis rotundianalis sp.n. and Pelethiphis opacus Koyum.) are described or redescribed. They were found on dung or carrion beetles (Scarabaeidae: Geotrupes Latr., Copris Geoffr., Oniticellus Serv., Onthophagus Latr., Aphodius Latr. and Silphidae: Nicrophorus Fabr.) in Slovakia.

ACARINA
MESOSTIGMATA
EVIPHIDIDAE
TAXONOMY

During the study of an extensive collection of phoretic mites found on insects, I have identified several eviphidid mites from dung beetles (Scarabaeidae) and carrion beetles (Silphidae). On the basis of a detailed analysis of this material (according to the papers by Ryke & Meyer, 1957; Ryke, 1959; Karg, 1963; Hirschmann, 1966; Evans, 1969, 1980 and Christie, 1983), here I describe or redescribe two genera and six species.

Scamaphis Karg, 1976


Palpigen with six setae, palpatarsus with normal chaetotaxy, without a pair of macroeupathidia. Apotele two-tined. Movable digit of chelicerae with only one denticle, fixed digit with several denticles.

* Institute of Zoology and Ecosozology, Slovak Academy of Sciences, Konvalinková 3, 842 23 Bratislava, Czechoslovakia.


Differential diagnosis: The intrafamiliar division of the family Eviphididae into eight known genera has been based on several important characters. Among them the sensillary macroeupathidia are found on the palparsi. The presence of only one pair of these setae is characteristic for the genera Evimirus Karg, 1963, Eviphis Berlese, 1903 and Scarabaspis Womersley, 1956. Representatives of the genus Pelethiphis Berlese, 1911 have only one macroeupathidium. The absence of these setae in genus Scamaphis Karg indicates that it belongs to the group of genera Alliphis Halbert, 1923, Crassicheles Karg, 1963 and Iphidosoma Berlese, 1892. Scamaphis differs from the above genera in having strongly reduced peritrematal shields which, as it is generally known, are strongly developed, especially in many eviphidid mites (Evimirus, Eviphis, Alliphis and Pelethiphis). Also, the number of dorsal setae is reduced in Scamaphis — from 30 pairs (Alliphis, Crassicheles and partly Iphidosoma) to 27 pairs. The genus Thinoseius Halbert, 1920 differs from all the genera mentioned above in having a different chaetotaxy on the palpigen (see the key of genera) and a reduced sternal shield in females.

Notes: Some eviphid genera (Eviphis, Evimirus, Scarabaspis) are distinguished by well defined characters. These characters are developed uniformly in the species of each of these genera. This is probably conditioned by the monophyletic origin of these taxa. At the same time, there are other genera in which the individual species are not so morphologically uniform and where it is difficult to find common and mutually linking characters. A typical case is that of the genus Pelethiphis, to which morphologically heterogeneous species (Pelethiphis equestris Berl., P. anoxiae Koyum. and P. pectinatus Ryke) have been assigned. This makes orientation in this genus difficult. It should be noted that the present accepted concept of the genus Pelethiphis (and at the same time its separation from the genus Alliphis), based on the presence of only one macroeupathidium on the palpars and on the prolonged marginal setae of the dorsum, is insufficient, and that the entire genus should be subjected to detailed revision. Irrespective of the above-mentioned species, I consider the chaetotaxy of the posterior part of the dorsal shield to be the most important criterion to distinguish the genus Pelethiphis. Setae Z5 and J5 are always among the shortest setae of the idiosoma (even when all other dorsal setae are thickened and prolonged), and the longest marginally or medially inserted setae exceed 10 times or more their length. Further unifying characters should be found in the denticulation of the chelicerae and in the shape of the tectum capituli.

Scamaphis equestris (Berlese, 1911)

Pelethiphis equestris Berlese, 1911 : Redia 7 : 183-186.

Female: Idiosoma: length 365-410 µm, width 205-220 µm in the widest fore part and 150-160 µm in the narrowed medial part.

Dorsum (Fig.1) : The dorsum is covered by a shield bearing 27 pairs of simple setae (the longest measuring 26-28 µm, the shortest 8 µm). Dorsal shield narrowed behind propodosoma, so that the sides of the body remain uncovered with a distinct reticulate ornamentation and many pores developed on the shield surface.

Ventrum (Fig. 2.) : Sternal shield elongate (95-105 µm long and 72-77 µm wide at the level of St2), with three pairs of equally sized setae and two pairs of pores. The first pair of pores are less visible and
are situated approximately parallel to the longitudinal body axis. The second pair of pores are bigger, ellipsoidal and situated perpendicularly to the longitudinal axis of the body. A slightly sclerotized praesternal shield and the tritosternum with a prolonged basal part lie anterior to the sternal shield. Metasternal shields sometimes fused with sternal shield. Genital shield with an indistinct reticulate ornamentation and with a pair of genital setae, one of which may be free in some cases. The metapodal shields are indistinct, pear-shaped. Peritrematal shields (Fig. 18) strongly reduced. Perianal region with nine pairs of simple setae. The anal shield is triangular and bears three setae.

Gnathosoma: Deutosternum with five distinct transverse rows of denticles and hypostome with two slender, long corniculi. Chelicera as in Fig. 25. Tectum capituli (Fig. 32) with a thick, long, apically pointed process with dentate lateral margins. Palp-genu with six setae, palptarsus with the normal chaetotaxy without macroeupathidia and with a two-tined apotele.

Material: Slovakia: Brunovce, 12 females-17. VIII. 1990, 11 females — 22. IX. 1991; these were found only on Geotrupes spiniger Marsh. Material deposited at the Institute of Zoology and Ecosozology, Slovak Academy of Sciences, in the author's collection.
**Scarabacariphis** gen. n.

Genotype: *Scarabacariphis grandisternalis* sp. n.

Palpgenu with six setae, palptarsus with normal chaetotaxy, without the pair of macroeupathidia. Apotele two-tined. Movable digit of the chelicera elongated, with one tooth, fixed digit with several denticles. Deutosternum with five distinct transversal rows of denticles. Tectum capituli with a long medial process and denticulate lateral margins. Dorsal shield with 30 pairs of simple setae. The length of the setae Z5 (designation of setae according to Karg, 1971) is the same as in other marginal setae, and approximately three times longer than \( s_{5} \).


Differential diagnosis: Similar to that of the related genera *Alliphis* and *Pelethiphis*, non-reduced sternal shield in females, six setae on palpgenu, undeveloped pair of macroeupathidia on palptarsus, chelicerae without hyaline processes and the leg.
chaetotaxy. Compared with the genera *Alliphis* and *Pelethiphis*, *Scarabacariphis* gen. n. shows distinctive differences in the dorsal chaetotaxy (the setae in the genus *Alliphis* are very short and approximately of equal length, the setae in *Pelethiphis* are very long and setae Z5 are usually more than 10-times shorter than the other marginal setae), in the size of the peritrematal shields and in the shape of the second pair of pores on the sternal shield (rounded in *Scarabacariphis* gen.n., slot-like in *Alliphis*).

**Scarabacariphis grandisternalis** sp. n.

**Female**: Idiosoma : length 385-425 μm, breadth 215-245 μm.

Dorsum (Fig. 3) : Body ellipsoidal, dorsally strongly convex. Dorsal shield with 30 pairs of setae, differentiated into long setae, situated on the marginal and fore part, and short setae in the medial part of the idiosoma. The shortest setae are z2, i5, r1, r2, f4 and f5 (they reach about 12 μm), the longest ranging between 35-38 μm. Setae r1 are lance-shaped, enlarged in the middle and shorter than s1. Setae r1 slender, but clearly visible. The body surface shows a distinct, regular reticulate ornamentation with numerous pores.

Ventrum (Fig. 4) : Well-developed extensive sternal shield (90-107 μm long and 85-95 μm wide at the level of St2) with a pair of slot-like pores, one pair of rounded pores and three pairs of equally long sternal setae. An arch-shaped sclerotized preaerial shield lies before it. Occasionally a fine reticulate ornamentation develops on the sternal shield, visible more conspicuously only near the sternal St2. Genital shield with a pair of genital setae. Anal shield triangular with three anal setae. Peritrematal shield (Fig. 19) narrow, normally developed, its fore part reaching the middle of the coxae I. A pair of metapodal shields elongate in shape. Perianal region with nine simple setae.

Gnathosoma : Deutosternum with five distinct transverse rows of denticles, hypostome with slender corniculi. Chelicera as in Fig. 28. Movable digit relatively slender with a big tooth. Tectum capituli (Fig. 33) with a long, pubescent medial process, enlarged in its medial part. Its lateral margins are denticulate. Palpignu with six setae, palparsus without macroeupathidia and with a two-tined apotele.

Derivatio nominis : The species name is derived from the strikingly extensive sternal shield.

Locus typicus : As shown by findings from two localities in the Považský Inovec mountains, it seems to prefer pastures in wooded to forest-steppe habitats. Up to now, it has been found only on *Onthophagus fracticornis* (Preysl.), although other species of the genus also occur here in great abundance.

Material : Holotype female with the following data : Slovakia : Považský Inovec mountains, Hrádok, 16. IX. 1990, on *Onthophagus fracticornis* Preysl., 4 paratype females with same data. 31 other paratype females : Považský Inovec mountains, Lúka, 1. IX. 1991, on *O. fracticornis*. Holotype and paratypes deposited at the Institute of Zoology and Ecosozology, Slovak Academy of Sciences in the author’s collection.

**Alliphis necrophilus** Christie, 1983


Female : Idiosoma : length 425-480 μm, width 290-315 μm.

Dorsum (Fig. 5) : Body elongate, widest in the medial part. Dorsal shield with 30 pairs of short, needle-like setae, differing only negligently in lengths. Marginal setae usually long on the whole dorsal perimeter, the internal setae become moderately shorter towards the distal part of the body, so that Z5 (and also i1) is finally twice as long as f5. The longest dorsal setae are z1, s5, i1, r2, f3, and partly also r5. The shortest is f5. None continuous reticulate ornamentation is developed on the surface, except for the fore part of the shield where it appears in the form of lines parallel to the fore margin of the idiosoma. In the posterior part a typical reticulation is apparent, from the edge of the idiosoma up to the line defined by the setae f4, f2 and Z3.
FIGS. 5-6: female of *Alliphis necrophilus* Christ. 5. — Dorsum of idiosoma. 6. — Venter of idiosoma.

Ventrum (Fig. 6): Sternal shield (100-110 μm long and 90-100 μm wide at the level of *Sr2*) with three pairs of sternal setae with two pairs of slot-like pores. A weakly sclerotized praesternal shield lies before it. Genital shield longitudinal, rounded distally, with two genital setae. Anal shield triangular with three anal setae. Two pairs of metapodal shields are present, the weaker of them usually indistinct or lacking. The peritrematal shields (Fig. 15) have no considerable width, nor pattern. Nine setae are in the perianal region.

Gnathosoma: Deutosternum with five distinct transverse rows of denticles, hypostome with slender corniculi, slightly enlarged in their basal part. Movable digit of chelicerae (Fig. 23) with one tooth, fixed digit multidentate. Tectum capituli (Fig. 31) with a long, slender and regularly weakening medial process. Its margins are rounded and denticulated, not prolonged to the lateral corners. Palpgenu with six setae and palptarsus with the normal chaetotaxy without macroeupathidia. Chaetotaxy of legs as in other congeners.

Male: Idiosoma: length 370-385 μm, width 235-240 μm.

Dorsal side similar to that of female. Ventrum with a longitudinal sternogenital shield (150-155 μm long and 105-111 μm wide at the level of second pair of pores) with five pairs of setae and three pairs of pores. First pair of slot-like pores, second and third pairs rounded. Anal shield free, with three anal setae. Peritrematal shields as in the female.

Tectum capituli (Fig. 31) is similar to the female. Chelicera (Fig. 24) differs from female chelicerae by
the structure of the movable digit with a developed spermatodactyl and a bilobed tooth. Very striking are the femur II (Fig. 9) and femur IV (Fig. 10) where one of the setae is transformed into a strongly chitinized spine (these characters have not been observed in the males of the genus Alliphis).


Alliphis phoreticus sp. n.

Female: Idiosoma: length 360-400 μm, width 225-260 μm.

Dorsum (Fig. 7): Body elongate, slender, widest at the level of the setae r5. Dorsal shield with 30 pairs of very short, needle-shaped setae, differing only negligently in lengths. Setae J5 and Z5 are only half the length of the surrounding setae J4, Z4 and S5. These setae are approximately of the same size as the remaining dorsal setae, (except for the slender and short r1). The reticulate ornamentation is developed only at the shield perimeter. There are many pores, whereas the pair placed near the setae J2 is situated on small protuberances.

Ventrum (Fig. 8): Sternum shield (80-90 μm in length, 70-75 μm in breadth at the level of S2) with three pairs of equally long setae and two pairs of slot-like pores. The first pair lies obliquely, the second perpendicularly to the body axis. Genital shield longitudinal with a pair of genital setae. Metapodal shields long, very slender and insignificantly curved. Peritrematal shields (Fig. 16) wide, without the reticulate ornamentation. Triangular anal shield with three setae, perianal region with nine pairs of setae.

Gnathosoma: Deutosternum with five distinct transverse rows of denticles, hypostome with slender corniculi. Movable digit of chelicera (Fig. 27) with one tooth, fixed digit with several teeth. Tectum capituli (Fig. 30) with a long, distally regularly narrowing medial process. Lateral margins of tectum capituli dentate, with three or four dents. Its basal part with two transversal lines interrupted in the middle. Palpgen with six setae, palptarsus with normal chaetotaxy without macroeupathidia. Leg chaetotaxy as in other congeneric species.


Body shape and other dorsal idiosomal characters identical or very similar to the female. Ventrum with a longitudinal sternogenital shield (140-150 μm in length and 95-100 μm in width at the level of the second pair of pores) with five pairs of setae and two pairs of pores. Anal shield free, triangular, with three anal setae. Peritrematal and metapodal shields as in females. Chelicera (Fig. 26) with a developed spermatodactyl on the movable digit. Tectum capituli (Fig. 30) similar to that of female.

Differential diagnosis: Length of the medial process of tectum capituli (more than twice the length of its basis), with shape of the dentate margins in Alliphis phoreticus sp.n. are similar to those in Alliphis halleri (G. & R. Canestrini, 1881) and Alliphis sculpaturatus Karg, 1963. Alliphis sculpturatus differs reliably from all other congeneric species by granulate sculpture on the dorsal shield. Other species have a continuous reticulate ornamentation on the whole shield surface or on the marginal parts (but it may be totally lacking). Alliphis phoreticus sp.n. can be distinguished from Alliphis halleri (= Alliphis siculus Oudemans, 1905 — according to the description and pictures of Costa (1963) and information of Šamsišák & Daniel (1978)) by several characters (Figs. 11-14 and 16-17): viz. in Alliphis halleri the female body length varies between 390-455 μm, denticles on tectum margins are small, hardly distinguishable, their number usually larger than four, J4, but also J5 are shorter than Z5, the reticulate ornamentation is continuous on the whole dorsum surface, position of the pores situated close to J2 is normal and the wide peritrematal shields have a characteristic ornamentation. In Alliphis phoreticus sp.n. the body length varies between 360-400 μm, denticles on the
Fig. 7-8: female of Alliphis phoreticus sp. n. 7. — Dorsum of idiosoma. 8. — Venter of idiosoma.

Tectum margin are clearly distinguishable, usually numbering 3-4, Z5, but also I5 are shorter than I4, the reticulate ornamentation is present only at the dorsal shield margins, the pores in the vicinity of I2 are situated on small protuberances and the peri-trematal shields have no ornamentation.

Derivatio nominis: The name of this species expresses the very characteristic feature in its bionomy— the use of phoresy on various Scarabbeids (Geotrupes spiniger Marsh., Copris lunaris (L.), Oniticellus fulvus (Goeze), Onthophagus sp. and Aphodius sp.).

Locus typicus: Our material shows that the species inhabits several habitats intensively used as cattle pasture. It shows no striking preference either for meadows or steppe associations. The primary preconditions for its occurrence are dung-beetles (Scarabaeidae) and cattle excrements. It also occurs at higher altitudes (pastures at elevations of approx. 1000 m a.s.l.).

Material: Holotype: Slovakia, Brunovce, 17. VIII. 1990, on Geotrupes spiniger Marsh., allotype male with same data. Paratypes: 14 females, 2 males — Brunovce, 28. VII. 1991, on Copris lunaris (L.); 2 females — Brunovce, 28. VII. 1991, on Oniticellus fulvus (Goeze); 7 females, 1 male — Horná Streda, 28. VII. 1991, on Onthophagus taurus (Schr.) and 13 females, 2 males — Nizke Tatry mountains, Liptovský Ján, 17. VIII. 1991, on Aphodius rufipes L. Holotype, allotype and paraty-
pes deposited at the Institute of Zoology and Ecosozology, Slovak Academy of Sciences in the author's collection.

**Alliphis rotundianalis** sp. n.


Dorsum (Fig. 20) : Body ovoidal, widest at the level of the setae \( s7 \). Dorsal shield with 30 pairs of variously long setae. Significantly longest are \( i2 \) and \( i3 \) and also \( s1, s2 \) and \( z1 \) which are approximately three times longer than \( i4, i5, l1, l2, z2 \) and \( z3 \). The shape of setae \( i4 \) and \( i5 \), which are the shortest on the dorsum, differs from that of others. They are not needle-like, but lance-like with a rounded apex. Surface reticulate ornamentation is lacking.

Ventrum (Fig. 21) : Stereognital shield (140-165 µm long and 90-105 µm wide at the level of the second pair of pores) with five pairs of equally long setae. Its most important character is the position of the first pair of the slot-like pores. These pores lies perpendicularly to the body axis. The second and third pair of pores are slot-like and rounded, respectively. Peritrematal shields wide, with ornamentation. Longitudinal metapodal shields clearly visible. Anal shield (68-76 µm long and 69-81 µm wide) extensive and except for the small lateral sinus, regularly rounded. Nine pairs of setae in the perianal area.

Gnathosoma : Chelicera (Fig. 22) with a short,
thick movable digit, bearing a sizable tooth and spermatodactyl. Tectum capituli (Fig. 29) with a long medial process, extended in its basal part and simple or branched needle-like spines growing irregularly on its central part. The tectum margins are prolonged anteriorly by one, or maximally two teeth. Palptarsus with normal chaetotaxy without macroeupathidia. Leg chaetotaxy as in other species of the genus Alliphis.

Differential diagnosis: By the perpendicular position of the first pair of the sternogenital pores, Alliphis rotundianalis sp. n. belongs to the species
FIGS. 29-33 : Tectum capituli. 29. — Male of *Alliphis rotundianalis* sp. n. 30. — *Alliphis phoreticus* sp. n. 31 — *Alliphis necrophilus* Christ. 32. — Female of *Scamaphis equestris* (Berl.). 33. — Female of *Scarabacariphis grandisternalis* sp. n.
group *Alliphis halberti* Ryke & Meyer, 1957 and *Alliphis montanus* Koroleva, 1969. The first species was described on the basis of deutonymph, and the second one on that of male and deutonymph. The males of *Alliphis rotundianalis* sp. n. differ from those of *Alliphis montanus* by the chaetotaxy of the dorsal shield, reticulate ornamentation on dorsum and shape of the anal shield. Comparison with the *Alliphis montanus* male tectum capituli is not possible as its description is lacking.

Notes: Position and shape of the first pair of the sternogenital pores in males of *Alliphis montanus* and *Alliphis rotundianalis* sp. n. are atypical of representatives of the genus *Alliphis*. This could indicate a relation to the genus *Pelethiphis*, where this phenomenon is usual in the males. This hypothesis is also confirmed by the fact that the new species are often described in the genus *Alliphis* on the basis of females, while in the genus *Pelethiphis* on the basis of males.

Derivatio nominis: The species name of this mite is derived from the rounded shape of the anal shield, which makes this species atypical.

Locus typicus: Found on lowland pastures (at elevations of 200 m) on several species of Scarabaeidae (Copris, Geotrupes, Oniticellus and Aphodius), with a predominant preference for species of the genus *Onthophagus*.


**Pelethiphis opacus** Koyumdjieva, 1981


**Male**: Idiosoma: length 560-680 μm, width 355-435 μm.

Dorsum (Fig. 34): Body ovoid, widest at the level of the setae s7. Dorsal shield with 30 pairs of setae, considerably differing in size. Setae localized at the idiosoma margin (excepting the seta Z5) are very long and thickened, becoming longer towards the distal end of idiosoma, thus the longest dorsal setae are S5 (they reach a length of 110-130 μm). The shortest are the setae IS (about 10 μm). The surface reticulate ornamentation is developed, but only weakly visible.

Ventrum (Fig. 35): Sternogenital shield (245-295 μm long and 125-155 μm wide at the level of the second pair of pores) with five equally long setae and three pairs of pores. The first of them is longest, slot-like, perpendicular to the longitudinal body axis. Peritrematal shields (Fig. 38) wide with an ornamentation. Metapodal shields distinctly visible, drop-shaped. Anal shield (100-130 μm long and 125-155 μm wide) is extensive, anteriorly widely ovoid, posteriorly narrowed with a postanal seta, which is approximately three-times longer than the anal setae. Eight pairs of setae are in the perianal region.

**Gnathosoma**: Tectum capituli (Fig. 36) with a long medial process and with indistinct lateral denticulated margins. The chelicera is shown in Fig. 37. Palptarsus with a longer arch-curved seta (macroeupathidia).

**Differential diagnosis**: The present species comes closest to *Pelethiphis gurei* Costa, 1963, found on *Copris hispanus* (L.) in Israel, with the following external differences: all marginal setae thickened, prolonged and of approximately equal length in *P. gurei*, the setae S5 several times longer than other medially situated setae, anal shield with approximately equal length and width, and finally, the ventral setae V8 longer than the postanal seta on the anal shield. In *P. opacus* the marginal setae are prolonged towards the distal end of the body, the lengths of setae S5 are approximately the same as in other medially situated setae, the anal shield is smaller — wider than long and the postanal seta distinctly longer than the setae V8.

Material: Slovakia, Brunovce, 8 males — 23. VI. 1991, on *Copris lunaris* (L.). Material deposited at the Institute of Zoology and Ecosozology,
Slovak Academy of Sciences in the author’s collection.

Identification key to genera of the family Eviphididae Berl. (females only):

1 (2) Palpgenu with five setae, tectum capituli with more (5-10) forwards directed processes. ......................... Thimoseius Halbert, 1920
2 (1) Palpgenu with six setae, tectum capituli with only one forward directed process.
3 (8) Palptarsus with a pair of macroeupathidia on its top.
4 (5) Palptarsus with a three-tined apotele .............................. Evinirus Karg, 1963
5 (4) Palptarsus with a two-tined apotele.

6 (7) Coxae I without setae, replaced by protuberances. Peritrematal shields not prolonged posteriorly to the stigma. ......................... Scarabaspis Womersley, 1956
7 (6) Coxa I with setae. Peritrematal shields significantly prolonged posteriorly to the stigma. ......................... Eviphis Berlese, 1903
8 (3) Palptarsus distally without a pair of macroeupathidia.
9 (10) Digitus mobilis of chelicera with hyaline appendix. ................. Iphidosoma Berlese, 1892
10 (9) Digitus mobilis of chelicera without hyaline appendix.
11 (12) Peritrematal shields reduced to a stigma and a short peritrema, 27 pairs of setae on dorsum. ......................... Scamaphis Karg, 1976
12 (11) Peritrematal shields not reduced, normal or
Key to species of the genus *Alliphos* Halb.

1 (6) First pair of pores on sternogenital shield perpendicular to the body axis (only males and deutonymphs known to date) (Fig. 21).

2 (3) Setae *z1* approximately three times longer than *l2*. Dimensions: DN 352 × 220 µm (only deutonymphs known), South Africa .......... *Alliphos halberti* Ryke & Meyer, 1957

3 (2) Setae *z1* and *l2* approximately equal in length.

4 (5) Longest setae on dorsal shield (the marginal and *l1*) approximately 1.5 — 2 times longer than other dorsal setae, anal shield triangular with widely rounded corners, setae *J4* and *J5* needle-like, surface with insignificant reticulate ornamentation. Dimensions: female 340 × 200 µm, DN 350 — 380 × 230 — 240 µm. Ukraine .......... *Alliphos montanus* Koroleva, 1969

5 (4) Longest setae on dorsal shield (*I2*, *I3*, *z1*, *z2* and *z1*) approximately three times longer than the shortest dorsal setae (*I4*, *I5*, *z2*, *z3*, *I1*, *I2*, *I4* and *I5*), anal shield rounded, setae *I4* and *I5* lance-like, surface reticulate ornamentation lacking. Dimensions: females 320-370 × 195-220 µm. Slovakia .......... *Alliphis rotundianalis* sp. n.

6 (1) First pair of pores on sternal or sternogenital shield parallel or oblique to the longitudinal body axis (Figs. 6, 7).

7 (12) Dentate lateral margins of tectum capituli decline distally, posteriorly from the medial process (Figs. 31, 39, 40).

8 (9) Species with the idiosoma longer than 410 µm (in females), setae *S5* twice longer than *J5*, the surface reticulate ornamentation visible only at the dorsum perimeter. Males with stout spines on femur II and femur IV. Dimensions: females 425-480 × 290-315 µm, males 370-385 × 235-240 µm. Britain, Slovakia ............... *Alliphis necrophilus* Christie, 1983

9 (8) Species with the idiosoma shorter than 410 µm (in females), setae *S5* and *J5* approximately equal in length, surface reticulate ornamentation strongly developed on whole dorsal surface, or absent, males without spines on legs.

10 (11) Dorsal shield widest at the level of setae *r5*, ends of peritrematal shields pointed, for tectum capituli see Fig. 39. Surface reticulate ornamentation well developed. Dimensions: female 375 × 240 µm, male 330 × 195 µm. Mozambique .......... *Alliphis santosdiasi* Ryke, 1959

11 (10) Dorsal shield widest in the middle of its length, ends of the peritrematal shield with sinuses, tectum capituli as in Fig. 40, surface reticulate ornamentation lacking. Dimensions: female 380-245 µm, South Africa ............... *Alliphis evansi* Ryke & Meyer, 1957

12 (7) Dentate marginal texture distally to the medial process with an even or increasing row of denticles or with one dent only (Figs. 30, 41-44).

13 (20) Dorsal shield with or without reticulate ornamentation, never with granulation.

14 (15) Medial process of tectum capituli (Fig. 41) short (shorter than two times the width of tectum base) and significantly stouter in its central part, width of the anal shield larger than its length, surface reticulate ornamentation developed. Dimensions: female 465 × 300 µm, male 375 × 240 µm. Czechoslovakia, Poland ............... *Alliphis chirophorus* Willmann, 1956

15 (14) Medial process of tectum capituli long (longer than two times the width of tectum base), slender and fluently narrowing, anal shield of approximately equal length and width.

16 (17) Peritrematal shields narrow, narrowed posteriorly to stigma, dorsal shield between setae *r5* and *r7* with incisions, body larger, tectum capituli as in Fig. 42. Dimensions: female 500 × 350 µm. Nepal ............... *Alliphis rosickyi* Samsinak et Daniel, 1978
17 (16) Peritrematal shields wide, usually cut behind the stigma, dorsal shield within a sinus between the setae r5 and r7, body smaller (under 460 μm).

18 (19) Setae Z5, but also J5 shorter than J4, surface reticulate ornamentation developed only at the dorsum margins, the pores close to setae J2 lie on small protuberances, peritrematal shields without ornamentation. Dimensions: females 360-400 μm × 225-260 μm, males 315-365 μm × 195-230 μm, Slovakia. ......... Alliphis phoreticus sp. n.

19 (18) Setae J4, but also J5 shorter than Z5, surface reticulate ornamentation continuously developed, the pores close to setae J2 do not lie on small protuberances, peritrematal shields with a typical ornamentation. Tectum capituli as in Fig. 43. Dimensions: females 390-455 μm × 220-290 μm, males 350-370 μm × 220 μm, Europe, Asia. .. Alliphis halleri S. et R. Canestrini, 1881 (= syn. Alliphis siculus Oudemans, 1905)

20 (13) Surface structure on dorsal shield coarse-grained. Tectum capituli as in Fig. 44. Dimensions: females 390-430 × 260 μm, Germany. ............. Alliphis sculpturatus Karg, 1963.

REFERENCES


