

Linzer biol. Beitr.	27/1	259-272	16.8.1995
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New mites (Acari, Astigmata: Canestriniidae; Prostigmata: Erythraeidae, Trombidiidae, Microtrombidiidae) for the fauna of Austria, Germany and Hercegovina with descriptions of four new species

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Abstract: Four new mites: *Canestrinia berndi* n. sp. from Hercegovina obtained from *Carabus latenuclatus plassensis* (Coleoptera, Carabidae), *Erythraeus malwiniae* n. sp. from Germany, *Microtrombidium wilibaldi* n. sp. from Austria and *Campylothrombium schwangauensis* n. sp. from Germany are described. *Photia bardoica* (Astigmata, Canestriniidae) and *Hauptmannia brevicollis* are new for the Austrian fauna; *Erythraeus monikae*, *H. brevicollis* and *Podothrombium piriformis* are new for the German fauna.

Key words: Acari, taxonomy, faunistics, Austria, Germany, Hercegovina.

Introduction

In this paper four new species belonging to the families Canestriniidae, Erythraeidae, Trombidiidae and Microtrombidiidae, all associated with various insects, are described. *Canestrinia berndi* n. sp. belongs to the genus distributed only in the Palearctic Region. To date 8 species of this genus are known in Europe, which are usually associated with beetles belonging to the genus *Carabus* (except *C. dorcicola* associated with *Dorcus paralellopedus* L. (Lucanidae) and *C. samsinaki* BERON associated with *Gnaptor* sp. (Tenebrionidae)) (SAMŠIŇÁK 1971, BERON 1975, HAITLINGER 1988b). *Erythraeus malwiniae* n. sp. belongs to the genus which larval stage are ectoparasites on Homoptera. To date 11 species of this genus based on larvae were known from Europe (HAITLINGER 1987, 1994b). *Campylothrombium schwangauensis* n. sp. and *Microtrombidium wilibaldi* n. sp. belong to the family Microtrombidiidae. This family is composed of about 12 genera, of which *Etmulleria* OUD. and *Willmanella* FEIDER are known only from larval stages. WELBOURN (1984) stated: „As with many other Parasitengona the type of the genus *Microtrombidium* is known only from the adult instar, and many of the larvae referred to *Microtrombidium* are not congeneric. The exact generic relationship cannot be established until the larvae of *Microtrombidium* can be identified“. This statement also applies to the other genera. For example, basing on features given by THOR & WILLMANN

(1947) and MEYER & RYKE (1960) for the genus *Ettmulleria* TRAG. it is impossible to differentiate this genus from the *Microtrombidium*. Besides, MEYER & RYKE wrote about *Ettmulleria*: „This difficult and perhaps even hypothetical genus was erected to accomodate a larval form described by TRÄGARDH as *Trombidium succidum*. Some authors consider this genus as representing a subgenus *Microtrombidium* while other, treat it as an independent genus. No definite proof exists as to which group of known adults these larval forms correspond“. In this paper *Microtrombidium* provisionally includes *M. wilibaldi* n. sp. It distinctly differs from other larval Microtrombidiinae and is compared to the most similar species belonging to the genera *Ettmulleria* and *Microtrombidium*.

Moreover the following species were found as new for the Austrian fauna: *Photia bardoica* HAITLINGER (Canestriniidae) and *Hauptmannia brevicollis* OUDEMANS (Erythraeidae). New localities and hosts are given for *P. chrysocarabi* COOREMAN (Canestriniidae) and *Allothrombium fuliginosum* (Trombidiidae). In Austria only *P. chrysocarabi* and *P. hejniana* (SAMŠIŇÁK, 1971) were hitherto known among the Canestriniidae; among erythraeids, trombidiids or microtrombidiids no species based on larvae have been reported, except *Podothrombium tymoni* HAITLINGER (HAITLINGER, 1994a) and *Erythraeus styriacus* TURK (TURK, 1981), which was described together with adults only from one larva.

As new for German fauna are shown the following species: *Erythraeus monikae* HAITLINGER, *Hauptmannia brevicollis* and *Podothrombium piriformis* ROBAUX & SCHIESS.

The terminology of structure and setal notation for erythraeids, trombidiids and microtrombidiids is adopted from SOUTHCOTT (1986a, b, 1987). The new species are deposited in the Museum of Natural History, Wrocław University (MNHU).

All measurements are given in micrometers (μm).

Description

Canestriniidae BERLESE 1884

Canestrinia BERLESE 1881

Canestrinia berndi n. sp.

Female: Dorsum ornamented by longitudinal and obliquely lines and some cellulaeform structures only on hysterosoma (Fig. 2). Setae scc ultralong, setae of series d with different length and thickness. Setae d1 are thin and the shortest, d2, d3 relatively thick; d3 the longest. Also setae l1, l2 relatively long and thick. Setae sci and scc thin and short. Setae vi relatively long.

Ventral side of idiosoma with two pairs of long setae d5, 15 of which 15 are distinctly longer and thicker. Setae hi somewhat enlarged. In genital region two pairs of short setae ga, gm. In anal region five pairs of setae; posterolateral to them two pairs of short setae (near long setae d5, 15). Small cuticular formation placed below anus (Fig. 1).

Legs I bear on genu three setae (Fig. 3); of them dorsal seta gda is somewhat longer and thicker than the second dorsal seta gdp. Tarsi I with two small setae near dorsal setae placed near tibia. At pretarsi on ventral side placed thick apical seta. Tarsus II has lower number of setae and dorsal setae without companion short setae. Genu with three setae but both dorsal setae are shorter than analogous setae on genu I (Fig. 4). Legs III (Figs. 5-6) with longer tarsi than in legs I-II, especially in leg IV.

M e a s u r e m e n t s : Length of idiosoma 460, width 384, vi 56, hi 56, sci 40, d1 34, d2 70, d3 98, d4 48, distance d1-d4 50, d2-d2 52, d3-d3 48, d4-d4 128, l1 84, l2 ~100, Ta I 66, Ta II 64, Ta III 82, Ta IV 100, SoTi I ~110, SoTi II ~110, SoTi III ~82, SoTi IV 48, gda I 44, gdp I 32, gda II, gdp II, sge III 32, st III 26, st IV ~30.

M a t e r i a l e x a m i n e d : holotype, 1 female.

L o c u s t y p i c u s : Hercegovina, Jablanica, 1961, from *Carabus latenulatus plassensis* (Coleoptera, Carabidae). Holotype in MNHWU.

E t y m o l o g y : The name of this species has been derived from the name Bernd.

R e m a r k s : *C. berndi* n. sp. is similar to three european species with at least one enlarged seta in series d or l: *C. occidentalis* SAMŠIŇÁK, *C. orientalis* SAMŠIŇÁK and *C. mahunkai* SAMŠIŇÁK. It can be distinguished from all these species by at least four enlarged dorsal setae in series d and l; in above mentioned species usually only one pair of dorsal setae is enlarged.

***Photia* OUDEMANS 1904**

***Photia bardoica* HAITLINGER 1988**

L o c a l i t y : Austria, Agnath n. Wörgl, 18 June 1993, 9 females, 5 males, 1 nymph, from *Carabus nemoralis*. This species is associated only with *C. nemoralis*. To date was known only from Poland (HAITLINGER, 1988a). New to Austria.

***Photia hejniana* SAMŠIŇÁK 1971**

Species known from Austria, Czechia, Croatia, Poland and Slovakia (SAMŠIŇÁK 1971, HAITLINGER 1988b). Its main host is *C. violaceus* L. It was obtained also from *C. croaticus* DEJ. Sometimes it occurred in great numbers e.g. 135 specimens from one *C. violaceus* in Poland. One female was obtained from *C. alpestris hoppei* in Styria, representing a new host for this species.

***Photia chrysocarabi* COOREMAN 1950**

Species known from Austria, Belgium, Czechia, England, France, Germany, Poland and Slovakia (COOREMAN 1950, SAMŠIŇÁK 1971, HAITLINGER 1988b). It is associated with *C. auronitens*. SAMŠIŇÁK reported that this species is also associated with *C. nemoralis* and *C. auratus* L. On *C. nemoralis* occurs *P. bardoica*; it is not known which species occurs on *C. auratus*. In Poland I have investigated many specimens of *C. auratus*, but none was associated with a member of the Canestriniidae.

In Austria were obtained 2 males and one nymph from *C. auronitens*, Agnath n. Wörgl, 18 June 1993 and 1 female and one nymph in the neighbourhood of Vienna, from *C. scheidleri* PANZ. It is a new (accidental) host for this species.

Erythraeidae OUDEMANS 1902***Erythraeus* LATREILLE 1806*****Erythraeus malwinae* n. sp.**

Idiosoma distinctly longer than wide; dorsal surface with 34 weakly barbed setae, unequal in length (Fig. 7). Scutum with two pairs of scutalae (Fig. 9); AL are somewhat longer than PL (these are somewhat damaged), both barbed. Sensillae nude; PSE distinctly longer than ASE. Slightly cuticular folds are visible at bases of ASE and PSE. A few wrinkles are situated about scutum. Both sides of scutum with two pairs of eyes.

On the ventral side of idiosoma behind coxae I-III there are two pairs of slightly barbed sternalae; of which St I are distinctly longer than St III. Coxae I-III each with barbed setae; coxala I almost threetimes longer than coxala II and somewhat less than twice as long as coxala III (Fig. 8).

Gnathosoma long (hypostomalae damaged). Palp on femur and genu with barbed subequal setae. Tibia with three shorter, barbed setae (Fig. 10). Tarsus with one relatively long seta, five shorter setae and one solenidion (Fig. 11).

Leg I: Leg setal formula: Ta- 1 So, 1 Fa, 4 N, 22 B; Ti- 2 So, 1 Vs, 17 B; Ge- 1 So, 1 Vs, 8 B; Tf- 5 B; Bf- 3 B; Tr- 1 B. Famulus placed proximally to SoTa (Fig. 12); VsGe and VsTi placed proximally to solenidia.

Leg II: Ta- 1 So, 2 N, 17 B; Ti- 2 So, 17 B; Ge- 1 Vs, 8 B; Tf- 5 B; Bf- 3 B; Tr- 1 B (Fig. 13).

Leg III: Ta- 1 N, 223 B; Ti- 1 So, 19 B; Ge- 8 B; Tf- 5 B; Bf- 3 B; Tr- 1 B. Ip = 1528+1426+1842 = 4796 (leg lengths were measured from the basal end of the trochanter (Tr) to the base of the pretarsal claws).

Measurements: Length of idiosoma 960, width of idiosoma 720, L 174, W 186, AW 62, PW 140, SBa 20, SBp 22, ASBa 50, ISD 100, AP 84, AL 180, PL 128, ASE 80,

PSE 132, DS 108-140, St I 90, St III 62, coxala I 172, coxala II ~60, coxala III 94, GL ~220, GW ~152, PaScFed 106, PaScGe 98, Ta I 228, Ti I 472, Ge I 290, Tf I 216, Bf I 232, TYr I ~90, Cx I 106, Ta II 200, Ti II 478, Ge II 238, Tf II 206, Bf II 214, Tr II 90, Cx II 130, Ta III 238, Ti III 674, Ge III 294, Tf III 276, Bf III 260, Tr III 100, Cx III 140.

Material examined: holotype, 1 larva, Germany, Garmisch-Partenkirchen, 9 June 1993, from plants, leg. R. Haitlinger; in MNHWU.

E t y m o l o g y : The name of the species has been derived from the name Malwina.

R e m a r k s : *E. malwinae* n. sp. belongs to the species group with very long legs I-III, such as *E. jowitae* HAITLINGER, *E. monikae* HAITLINGER and *E. mariolae* HAITLINGER (HAITLINGER 1987, 1994b).

It differs from these species by especially long Ti III (the longest Ti III among species belonging to genus *Erythraeus* had *E. elwirae* 560; in *E. malwinae* 674); moreover by the shape of the scutum, where width and length are almost equal; whereas in the other species the width of the scutum is distinctly larger than its length.

***Erythraeus monikae* HAITLINGER, 1987**

Species known only from Poland (HAITLINGER 1987). Three larvae were obtained from plants in Garmisch-Partenkirchen (Germany), 9 June 1993. New to Germany.

***Hauptmannia* OUDEMANS 1910**

***Hauptmannia brevicollis* OUDEMANS 1910**

This species is known from Holland, Poland and Sweden and is associated with Thysanoptera (HAITLINGER 1986). In Austria one larva was found in Kitzbühel, 18 June 1993, and in Germany one larva in Garmisch-Partenkirchen, 9 June 1993, both from plants. It is new for the fauna of Austria and Germany.

Microtrombidiidae THOR 1935

***Campylothrombium* KRAUSSE 1816**

***Campylothrombium schwangauensis* n. sp.**

Idiosoma elongated. Dorsum of idiosoma with scutum, scutellum, four platelets, a pair of ocular sclerites and 16 setae below scutellum (Fig. 16). Scutum somewhat longer as wide, bearing nude setae AM and AL, barbed setae PL and nude sensillae (Fig. 18). PL>AM>AL. Scutum bears longitudinal lines at lateral margins between bases of AM and AL; the rest of its area is punctate. The posterior margin of scutum slightly convexed, its posterolateral margins are concave. Dorsal setae slightly barbed; fD = 4-4-4-2-2 = 16.

Two pairs of eyes placed at posterolateral margins; the anterior pair distinctly larger than posterior pair.

Ventral surface of idiosoma bears two smooth sternalae between coxae III next to margin of each coxa; setae behind coxae III similar to dorsal setae, barbed; the first pair somewhat longer than the other ones. Sternalae are distinctly shorter from them (Fig. 19). $fV = 2-2-4-4 = 12$. $NDV = 28$.

Gnathosoma with digital, enlarged hypostomalae (with 8 fingers). The ring of mouth present. Palptibia with two relatively short setae, slightly barbed (1 barb). Palptarsus with one long, nude seta, five short setae and single solenidion (Fig. 19).

Coxae of legs I with two setae; the upper seta slightly barbed (two barbs). the lower seta nude (Fig. 17). Coxae I, II with one seta each, seta on coxae II nude, seta on coxa III with one barb.

Leg I: Leg setal formula: Ta- 1 So, 1 Fa, 2 N, 15 B. Famulus is placed before solenidion; Ti- 2 So, 1 Vs, 1 N, 5 B. Vestigala is placed next to proximal solenidion; Ge- 2 So, 1 Vs, 1 N, 3 B; Vs is placed proximally to both solenidia and relatively far from them; Fe- 3 N. 3 B, Tr- 1 B.

Leg II: Ta- 1 So, 1 Fa, 1 N, 13 B. Famulus placed proximally to solenidion; Ti- 1 So, 3 N, 3 B; Ge- 1 So (relatively long), 1 N, 1 B; Fe- 1 So, 4 N, 1 B; Tr- 1 B.

Leg III: Ta- 13 B, Ti- 5 B; Ge- 1 So (relatively long), 2 B; Fe- 2 N, 2 B; Tr- 1 B (Figs 20-23). $Ip = 302+274+318 = 894$ (holotype), $308+280+306 = 894$ (paratype) (leg lengths were measured from the basal end of the trochanter to the base of the pretarsal claws).

Measurements: Length of idiosoma 528, width of idiosoma 344, L ~ 196, W 168, AW 134, PW 162, AMB 86, LN ~ 62, AP 58 holotype, 58 paratype, MA 86, 84, ASB 152, PSB 44, AM 42, 40, AL 30, 36, PL 50, 56, SE 72, 80, SB 110, 106, DS 56-62, 60-64, length of ocular plate 38, GL (length of gnathosoma) ~120, 120, ~128, SA 32, 34, OW 80, PLN 40, OL 60, PSW ~186, PSL 66, Ta I 96, 100, Ti I 58, 52, Ge I- 30, 28, Fe I 76, 74, Tr I 42, 44, Cx I 76, 74, Ta II 84, 84, Ti II 56, 60, Ge II 24, 22, Fe II 66, 72, Tr II 44, 42, Cx II 66, 66, Ta III 74, 72, Ti III 80, 74, Ge III 26, 24, Fe III 84, 84, Tr III 54, 52, Cx III 72, 72.

Material examined: holotype, 1 larva, Germany, Schwangau, 8 June 1993, from plants; 1 larva, paratype (damaged), locality the same as in holotype; leg. R. Hailinger; in MNHWU.

Remarks: *C. schwangauensis* n. sp. is similar to *C. barbarum* (LUCAS), but differs by the following features: scutum is covered by longitudinal lines only at lateral margins; the remaining area is punctate; scutum is longer, sensillae are shorter, dorsal setae are almost equal in length, whereas in *C. barbarum* they are distinctly unequal, the lack of a long pair of caudal setae; $fD = 16$ to 24 in *C. barbarum* and $fV = 12$ to 6 .

Microtrombidium* HALLER 1882**Microtrombidium wilibaldi* n. sp.**

Idiosoma distinctly longer than wide. Dorsum of idiosoma with scutum, scutellum, four platelets, a pair of ocular sclerites and 16 setae different in length. Scutum badly visible (tucked) with longitudinal lines, punctated, laterally with cellulaeform ornament; bearing barbed setae AL, PL nude AM and sensillae. $PL > AL > AM$. Setae AM more than twice as short as the other scutalae. Scutum with longitudinal lines and is punctated. Scutellum with straight anterior margin and concave posterior margin, narrow. Setae on scutellum relatively near one, barbed. These setae, setae on platelets and two setae beyond posterior platelets longer than the other ones (Fig. 24). $fd = 4+4+6+4 = 18$. Two pairs of eyes placed at posterolateral margins of scutum; the anterior part larger than posterior part.

Gnathosoma hardly visible with hypostomalae (Fig. 26). Palptarsus bears 7 setae (with solenidion) (Fig. 27).

Ventral surface of idiosoma bears two slightly barbed sternalae between coxae III (1-2 barbs), setae behind coxae III similar to dorsal setae except one pair of caudal setae which are relatively long and at least twice or threetimes longer than the remaining ventral setae (Fig. 25). $fv = 2-2-2-2-2 = 10$. $NDV = 28$. Coxae I with two setae, one of them is distinctly barbed and at least twice as long as the second nude seta (Fig. 29). Coxae II, III with one barbed seta each (Figs. 25, 30).

Leg I: Leg setal formula: Ta- 1 So, 1 Fa, 2 N, 17 B; Ti- 2 So, 1 Vs, 6 B; Ge- 2 So, 1 Vs, 1 N, 3 B; Fe- 3 N, 3 B; Tr- 1 B. **Leg II.** Ta- 1 So, 1 Vs, 1 N, 13 B; Ti- 2 So, 5 B; Ge- 1 So 2 B; Fe- 2 N, 3 B; Tr- 1 B. **Leg III.** Ta- 13 B; Ti- 5 B; Ge- 1 So, 2 B; Fe- 1 N, 3 B; Tr- 1 B (Figs. 28, 31, 32). $Ip = 274+246+272 = 782$ (holotype), $264+230+252 = 746$, $272+232+266 = 770$ (paratypes).

Measurements: Length of idiosoma 1168 (holotype), 1120, 1056 (paratypes), width of idiosoma 832, -, -, AP 84, 70, 70, MA -, 80, -, LN -, ~40, -, PSB -, ~60, -, AM 24, 24, 26, AL -, 58, 64, PL 80, 66, 64, SE -, ~60, -, SB -, 94, 100, DS 64-70, 50-82, 64-80, length of ocular plate ~42, 38, -, GL 114, 130, -, SA 40, 48, 52, OW 74, 66, 76, PLN 24, -, -, OL 72, 60, 60, PSW ~140?, 200, -, PSL -, 40, 40, Ta I 84, 76, 80, Ti I 56, 54, 54, Ge I 24, 24, 24, Fe I 56, 62, 64, Tr I 54, 48, 50, Cx I 76, 70, 72, Ta II 70, 64, 66, Ti II 50, 42, 44, Ge II 20, 22, 20, Fe II 60, 58, 60, Tr II 46, 44, 42, Cx II ?, 60, 62, Ta III 64, 62, 64, Ti III 62, 56, 60, Ge III 20, 22, 22, Fe III 64, 62, 62, Tr III 62, 50?, 58, Cx III -, 70, 72.

Material examined: holotype, 1 larva, Austria, Gmunden, 18 June 1993, from plants; 2 larvae paratypes; locality the same as in holotype; leg R. Haitlinger, in MNHWU.

Remarks: *Microtrombidium wilibaldi* n. sp. is provisionally included to the genus *Microtrombidium*. It is similar to *Ettmulleria succidum* TRÄGARDH, *Microtrombidium striaticeps* (OUD.), *M. fasciatum* (KOCH), *M. muscarum* RILEY and *M. demejieri* OUD. It can be distinguished from these species by the presence one barbed seta and one nude seta

on the coxa I, the presence four platelets on dorsum (except *M. demeijeri* and *M. fasciatum*), the arrangement of ventral setae below coxae III and distinctly shorter lateral, dorsal than median setae (except *M. fasciatum*).

Trombidiidae LEACH 1815

***Allothrombium* BERLESE 1903**

***Allothrombium fuliginosum* (HERMANN, 1804)**

Species widely distributed in Europe and North Africa, known from adults and larval stages. In Austria recorded by WILLMANN (1951). New locality in Austria: Salzburg, 18 June 1993, 10 larvae from plants.

***Podothrombium* BERLESE 1910**

***Podothrombium piriformis* ROBAUX & SCHIESS 1982**

Species known only from Switzerland (ROBAUX & SCHIESS 1982). Two larvae were obtained from plants in Schwangau (Germany), 8 June 1993. New to Germany.

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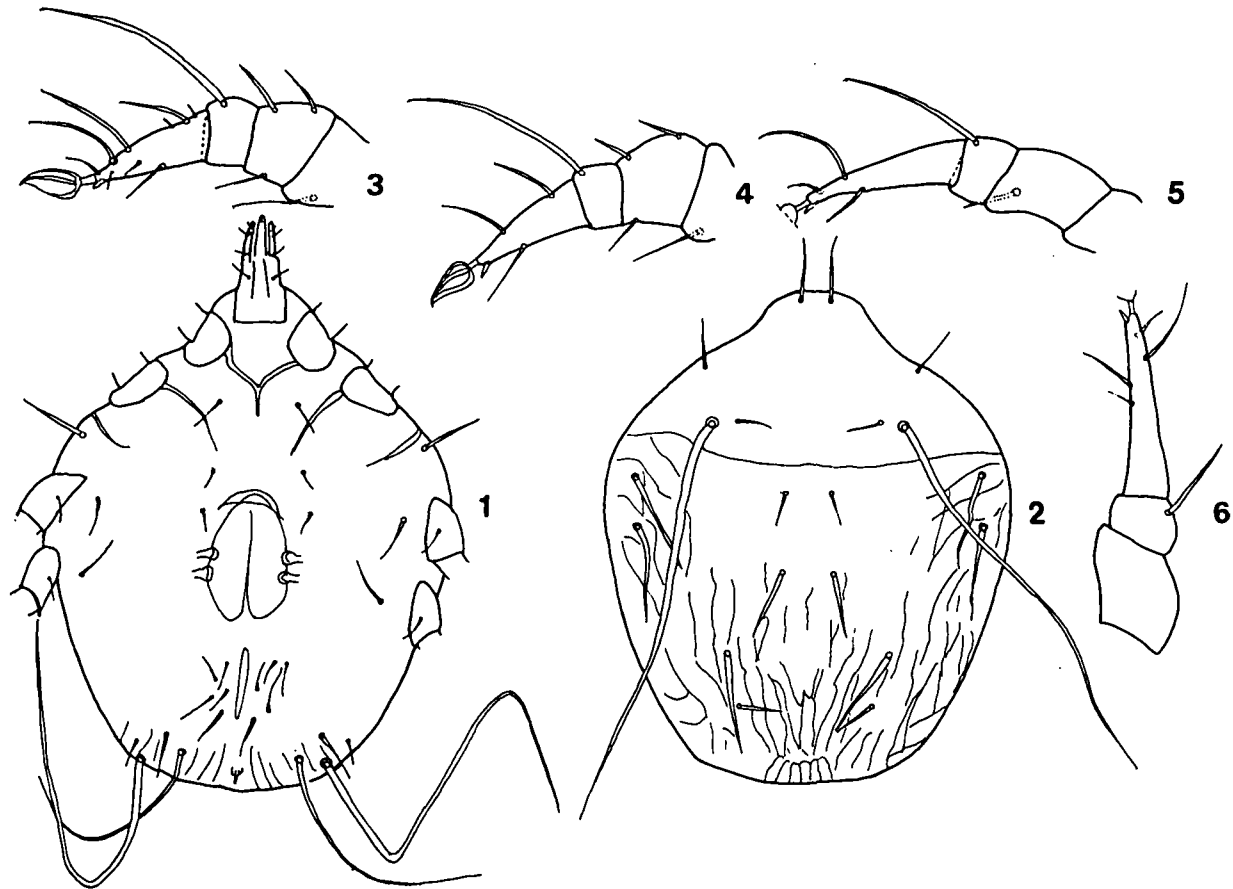
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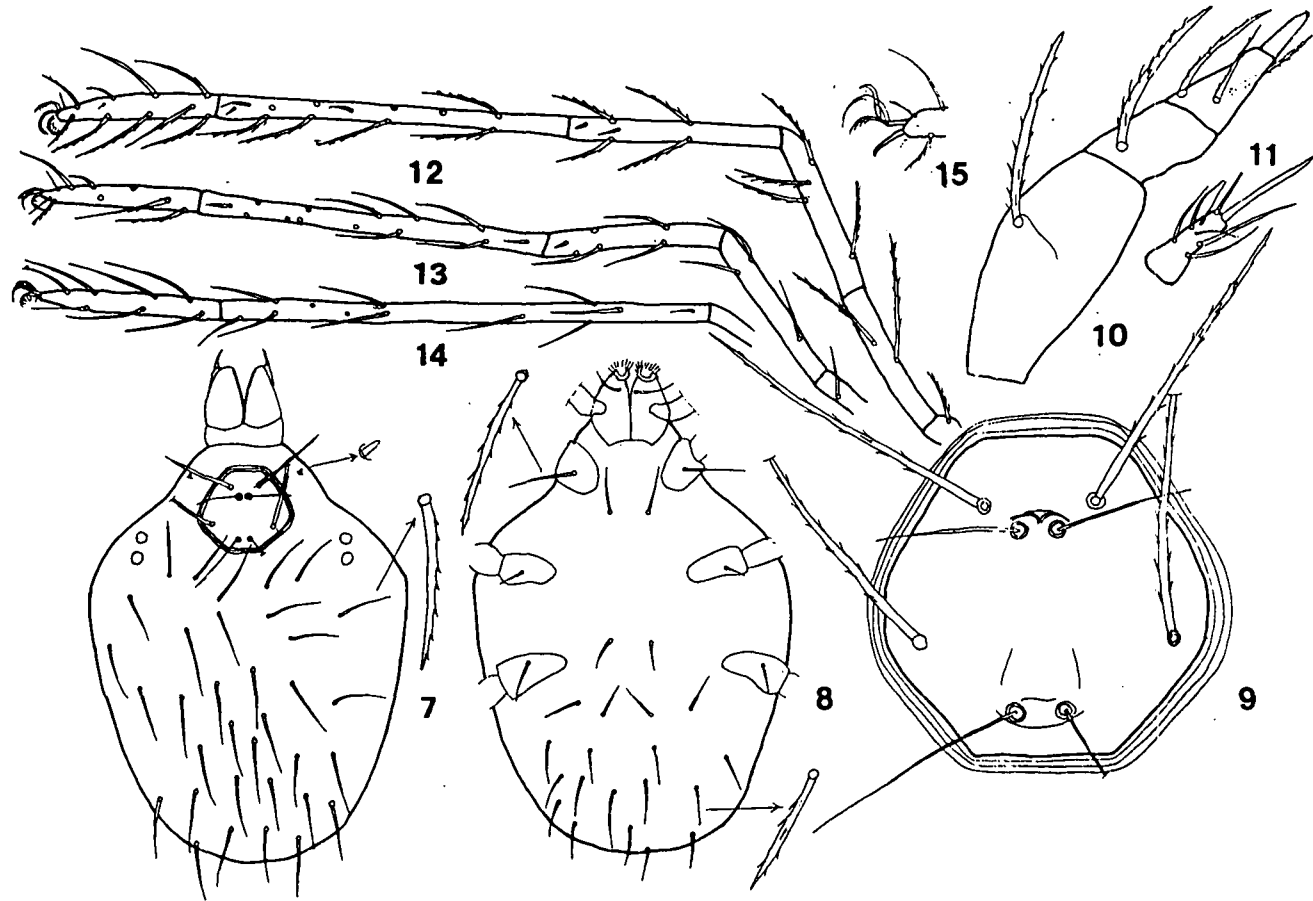
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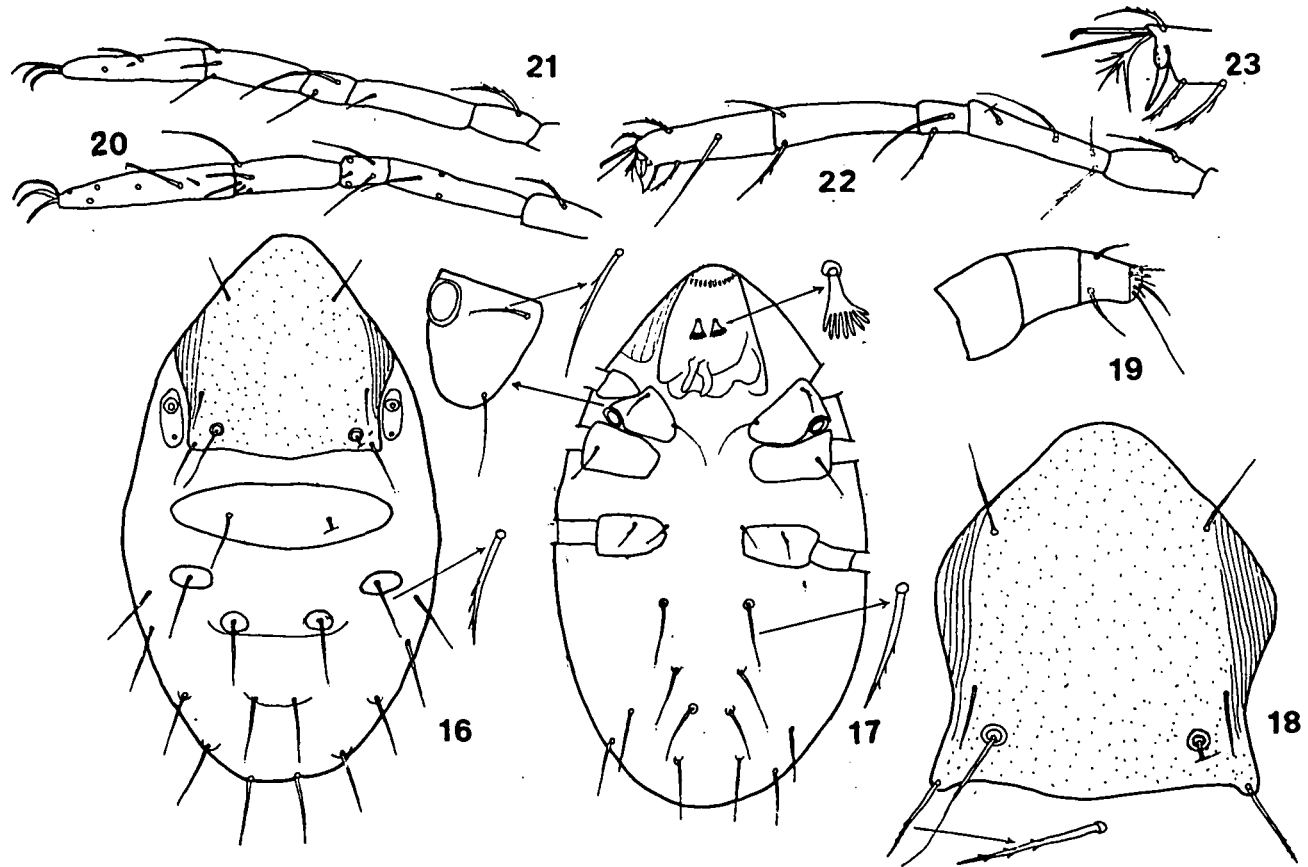
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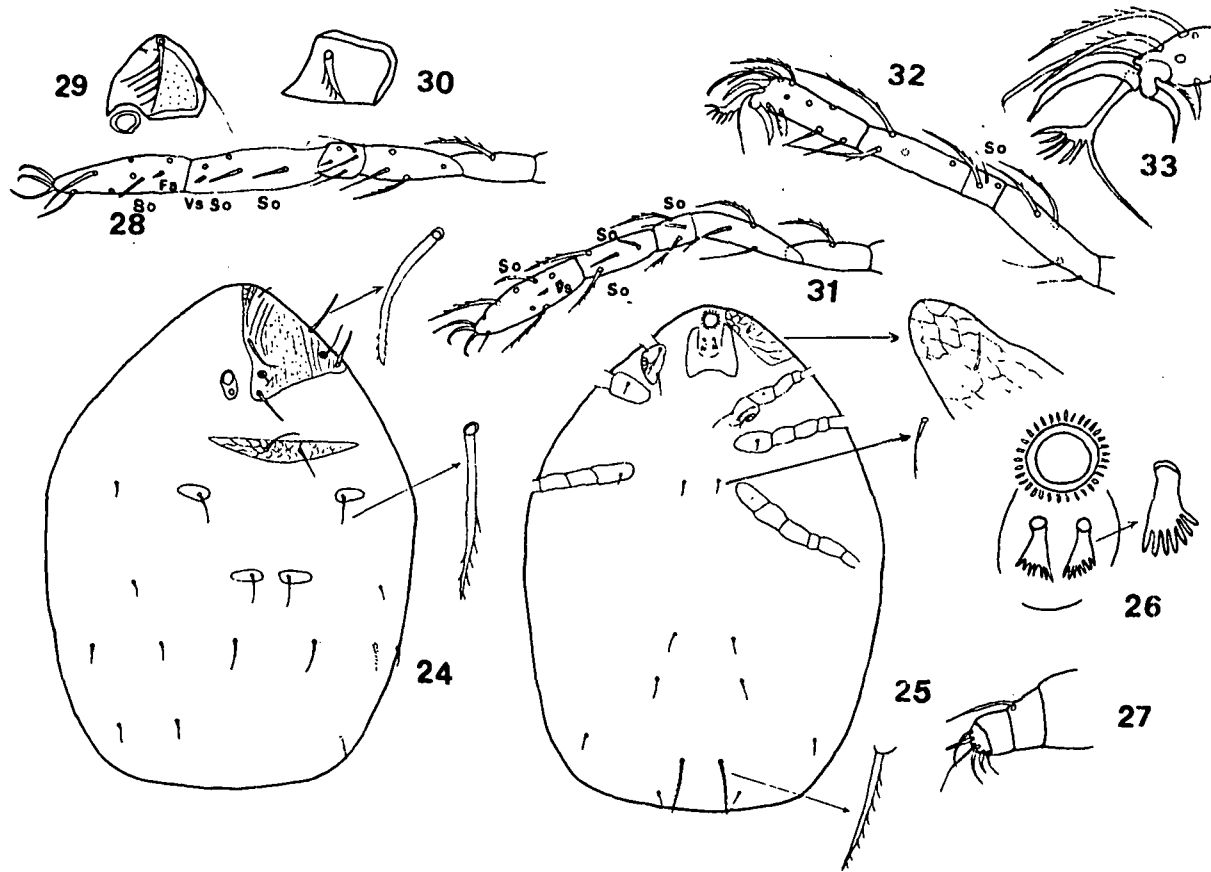
Figs. 1-6: *Canestrinia berndi* n. sp.; 1: idiosoma, ventral view; 2: idiosoma, dorsal view; 3: leg I, tarsus-femur; 4: leg II, tarsus-femur; 5: leg III, tarsus-femur; 6: leg IV, tarsus-genu.



Figs. 7-15: *Erythraeus malwinae* n. sp.; 7: idiosoma, dorsal view; 8: idiosoma, ventral view; 9: scutum; 10: palp; 11: palptarsus; 12: leg I, tarsus-trochanter; 13: leg II, tarsus-basifemur; 14: leg III, tarsus-tibia; 15: tarsus I, fragment.



Figs. 16-23: *Campylothrombium schwangauensis* n. sp.; 16: idiosoma, dorsal view; 17: idiosoma, ventral view; 18: scutum; 19: palp; 20: leg I, tarsus-trochanter; 21: leg II, tarsus-trochanter; 22: leg III, tarsus-trochanter; 23: leg III, fragment.



Figs. 24-33: *Microtrombidium wilibaldi* n. sp.; 24: idiosoma, dorsal view; 25: idiosoma, ventral view; 26: gnathosoma, fragment; 27: palp; 28: leg I, tarsus-trochanter; 29: coxa I; 30: coxa II; 31: leg II, tarsus-trochanter; 32: leg III, tarsus-femur; 33: tarsus III, fragment.

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Zeitschrift/Journal: [Linzer biologische Beiträge](#)

Jahr/Year: 1995

Band/Volume: [0027_1](#)

Autor(en)/Author(s): Haitlinger Ryszard

Artikel/Article: [New mites \(Acari, Astigmata: Canestriniidae; Prostigmata: Erythraeidae, Trombidiidae, Microtrombidiidae\) for the fauna of Austria, Germany and Hercegovina with descriptions of four new species. 259-272](#)