

FIRST RECORD OF THE GENUS *ATRACTOTHROMBIUM* FEIDER, 1952 (ACARI: MICROTROMBIDIIDAE) FROM TURKEY

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ABSTRACT: *Atractothrombium sylvaticum* (C. L. Koch, 1835) is described based on active postlarval forms and larvae obtained from adult females kept in the laboratory. This genus is first new record from Turkey. Original drawings for all known stages of the species are included. Also, morphological features, biology and zoogeographical distributions are given here.

KEY WORDS: Acari, Microtrombidiidae, *Atractothrombium*, adult, larvae, Turkey.

Microtrombidiidae Thor, 1935 have got 115 genus and the genus of *Atractothrombium* Feider, 1952 have 14 species (Makol & Wohltmann, 2012). To date, this genus hasn't been reported from Turkey (Erman et al., 2007; Makol & Wohltmann, 2012).

In this paper adults and deutonymphs of *Atractothrombium sylvaticum* (C. L. Koch, 1835) collected from soil and larvae were obtained from females and described and illustrated which is collected from Erzincan, Turkey.

MATERIAL AND METHODS

The following collecting methods were used: hand collecting, litter sifting and extraction in Berlese funnels. Larvae were reared from eggs deposited by adults collected in the field. Larvae obtained from females under conditions of laboratory. Females for lay eggs were used glass vials (34×24mm), filled to the upper margin with charcoaled Plaster-of Paris.

Examined material was preserved in 70% ethyl alcohol and cleared in 9% KOH. Specimens for light microscope studies were fixed on slides in Hoyer's medium (Krantz & Walter, 2009). Measurements were taken and drawings made under a Leica DM 4000 microscope with differential interference contrast and phase contrast. For morphological terminology see by Gabryś (1999) and Mağol (2005) followed in the text. All measurements are given in micrometers (µm).

RESULTS AND DISCUSSION

Family Microtrombidiidae Thor, 1935

Genus: *Atractothrombium* Feider, 1952

Type sp.: *Microtrombidium fusicomum* Berlese, 1910

Atractothrombium sylvaticum (C. L. Koch, 1835)

Adult. Standart measurements in Table 1. Colour in life red or reddish. Idiosoma slightly enlarged in the shoulders and narrowed toward the end (Fig. 1). Body length is 1630-1992 and width 1248-1469.

Gnathosoma. Chelicera is typical for Microtrombidiidae and internal edge of cheliceral blade serrated (Fig. 2). Medial surface of palp tibia one robust

paradont, two row ctenidia and radula. Distal ctenidium of palp tibia composed of 4–5 long and strong spinisetæ situated behind paradont. Proximal ctenidium consists of 5–7 thinner and more slender spinisetæ. Radula consist of 9–10 spine like setæ (Fig. 3). Lateral face of palp tibia covered setulose or few nude setæ and with long, strong basidont situated at the base of palp tarsus and with one long, smooth, whip-like setæ at the base of odontus. Tip of palp tarsus with 1 eupathidia (ζ) and 3 solenidion (ω) (Fig. 4).

Idiosoma. Anterior border of aspidosoma triangular in outline (Fig. 5). Anterior process of crista metopica narrowed toward the end and border of anterior region not merge with vertex. Sclerotized vertex with 21–25 long, setulose and nonsensillary setæ (AM). Sensillary area of crista metopica rounded and bear two medium length, smooth sensillary setæ. Posterior process distinct, sessile double eyes placed on at half length of the anterior part of crista metopica and anterior lenses much bigger than posterior ones. Dorsal opisthosomal setæ uniform, short, narrowing distally, covered with delicate setules (Fig. 6). Mid-dorsal setæ (mdS) of almost the same length as post-dorsal ones (pdS). Ventral setæ uniform, slightly longer and narrowed. Genital opening between koksa III and IV; consist of epivalve and centrovalve. Centrovalves covered densely with nude setæ and epivalve with delicate setæ; three pairs of genital acetabula (Fig. 7). Anus with barbed setæ (Fig. 8).

Legs. Each one occur seven part. Legs without lamellar processes, shorter than idiosoma and with one pair claw (Fig. 9).

Deutonymphs. Body smaller than adult. Other characters as in adults. Medial surface of palp tibia one paradont, one row ctenidia and radula (Fig. 10). Lateral face of palp tibia covered setulose or few nude setæ and with thin, long basidont situated at the base of palp tarsus (Fig. 11). Two pairs of genital papillae (Fig. 12).

Larvae. Standard measurements in Table 2. All larvae reared collected the field from females in the laboratory condition. Colour in life orange.

Gnathosoma. (Fig.13). Chelicera typical, cheliceral blade with teeth along on internal edge, slightly curved, and sharp towards the tip (Fig. 14). Movable gnathosoma typical and at anterior end with a ring-like sclerite (stephanostome) bearing about 30–40 distal teeth (Fig. 13). One pair of protorostral (adoral) setæ situated laterally. Ventrally at anterior part of gnathosoma a pair of prominent tritorostral (subcapitular) setæ, each with 7–8 finger-like setules at the distal end. Palpal formula: $fPp: o-N-N-NNN-NN\omega\zeta\zeta NNNN$. Palp femur and genu each with one minute spine-like seta. Palp tibia with one smooth seta, one small seta and one minute spine setæ. Palp tibial claw (odontus) distinctly bifurcate in more than half of its length. Palp tarsus with one prominent proximal solenidion (ω), two eupathidia (ζ), two long and four short spine setæ (Fig. 15).

Idiosoma, dorsum (Fig. 16). Scutum (L 176, W 150) with laterally stolascutum. Scutum surface of the sclerite punctuated. Setæ on scutum: anterior pair AM smooth, median pair AL smooth and posterior pair PL thicker and short barbed. One pair of smooth trichobothria (S) towards the end pointed. Laterally at the level of posterior end of scutum paired eye lenses on common sclerites. Scutellum punctuate, with striation similar to that on scutum, bears one pair of barbed c_1 setæ situated at half length of the sclerite. Dorsal setæ formula: $fD: (2)4-6-6-6-4$. Setæ d_1 on the largest plates, setæ c_2 on the second largest plates, setæ, $c_3-d_3-e_{1-3}-f_{1-3}-h_1$ smaller platelets.

Idiosoma, ventrum (Fig. 17). One pair of Claparède's organs laterally between coxae I and II. Coxal plates punctuated. Coxa I with setæ 1a placed in medial

position and nude, 1b lateral position, bifurcate. Supracoxala I absent. Coxa II with setae 2b bifurcate. Coxa III with setae 3b with bifurcate. One pair of setulated intercoxal setae 3a, nude and pointed top of the end. Posteriorly following four barbed setae anterior and lateral to anal opening. Anal opening without sclerite.

Legs (Figs 18-20). Segmentation formula: 6-6-6. Leg chaetotaxy in Table 3. Excluding of sensillar setae, all setae with setules. All tarsi with one paired claws and claw-like empodium. Leg III tarsus with modified inner claw (smilum), scopa and lophotrix (Fig. 20).

Material examined. 02.06.2011, 6 female, 4 postlarvae and 15 deutonymf. Grassy-mossy soil, N39°36'42" E39°28'53" 2060 m Ergan Mountain, Erzincan, Turkey. Leg. S.Adil. 09.06.2012 4 female. Grassy-mossy soil, N39°36'22" E39°28'55" 2065 m. Ergan Mountain, Erzincan, Turkey. Leg. S.Adil.

Distribution. Austria, France, Germany, Hungary, Ireland, Italy, Norway, Poland, Romania, Switzerland, Netherlands (Makol & Wohltmann, 2012). New for Turkish fauna.

Biology. Adults (n=6 female, 4 postlarvae and 15 deutonymf) collected from land (grassy and mossy area) in April-May 2011. 6 females deposited eggs 10-17 days at laboratory condition. Eggs single pack and colour of light orange. Eggs developed into prelarvae 6-8 days and 13-17 days larvae. Totally 166 larvae obtained from eggs.

DISCUSSION

Turkish specimens of *Atractothrombium sylvaticum* differs some morphological differences from European specimens (Gabryś, et al. 2005): Adults of Turkish specimens differs from European specimens in several respect. Proximal ctenidium of Turkish specimens consist of 6-7 thinner spinisetae, European specimens consist of 5-9 setae; the radula of Turkish specimens consist of 8-10 long spine like setae, European specimens consist of 5-9 setae. In addition, morphological differences are available of these specimens (see Table 1).

Turkish specimens larvae also differ from European specimens larvae by the AL setae and coxal setae. Turkish specimens setae on scutum AL nude, thicker and pointed towards the end, European specimens AL setae few short barb and thinner. Turkey specimens on coxa I 1a setae nude and pointed towards the end, coxa II 2a bifurcate, coxa III 3a nude or thiny setules and 3b bifurcate, European specimens on coxa I 1a setae with 0-1 setules, coxa II 2a with 1-3 setules, coxa III 3a and 3b with 2-3 setules. All coxal setae are thicker than European specimens. Morphometric data on larvae of Turkish specimens and European specimens show of Table 2. In addition, morphological differences are available chaetotaxy of legs I-III (genu-tarsus) for larvae of Turkish specimens and European species (see Table 3).

ACKNOWLEDGEMENTS

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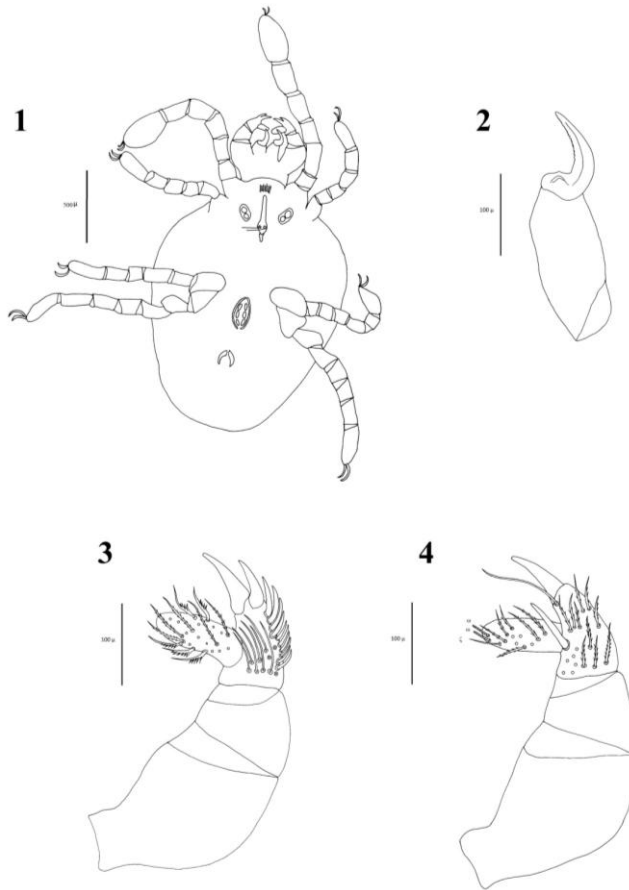
Table 1. Morphometric data on adults of *Atractothrombium sylvaticum*.

Character	Turkish specimens ♀ (n=10)		European specimens neotype (Gabryś et al., 2005)
	Min.	Max.	
LB	1630	1992	1855
WB	1248	1469	1537
LB/WB	1,29	1,35	1,20
Ch BS (L)	167	218	220
Ch BS (W)	83	101	98
Ch Cl	108	121	117
PaTr (L)	65	93	73
PaTr (W)	86	125	103
PaFe (L)	175	234	147
PaFe (W)	150	180	161
PaGe (L)	91	122	80
PaGe (W)	106	119	122
PaTi (L)	109	132	107

PaTi (W)	67	77	78
Odo (L) (Lft/Rt)	78/80	86/93	72/82
Par (W) (Lft/Rt)	55/62	58/62	lack/67
diCt(n) (Lft/Rt)	5/4	5/5	6/6
prCt(n) (Lft/Rt)	6/6	6/6	6/5
Bas (n) (Lft/Rt)	1/1	1/1	lack/1
Bas (Lft/Rt)	68/68	77/79	lack/75
Rad (n) (Lft/Rt)	9/5?	10/10	5/10
PaTaSol(n)	2/2	2/3	4/5
PaTa (B)	95	118	115
PaTa (E)	39	47	42
mdS [S]	22-26	25-30	24-27
mdS [P]	4-7	5-7	7-9
pdS [S]	24-30	27-35	24-27
pdS [P]	4-7	5-7	7-9
vS [S]	23-28	25-35	25-30
vS [P]	4-7	5-7	7-9
CML	303	390	406
CMW	25	32	37
ASB	28	34	268
PSB	32	33	138
AM (n)	20	22	20
AM (L)	0	70-100	60-90
RCM	215	245	229
SAL	69	70	69
SAW	68	75	62
SB	36	42	38
SE	115	145	170
pPr	51	76	108
acpPr	16	18	20
OL	84	86	82
OCM	121	140	160
ao	34	34	32

pO	30	30	27
O-O	252	302	320
OaD	114	156	166
OSD	117	130	102
GOp (L)	245	296	200
gs [S]	25-35	35-40	25-37
pgs [S]	25-35	25-35	25-37
An (L)	101	113	137
An La	20-30	20-30	25-50
Cx_I	256	280	343
Tr_I	99	119	117
Bf_I	217	272	235
Tf_I	150	193	166
Ge_I	186	230	205
Ti_I	205	207	215
Ta_I (L)	305	325	353
Ta_I (W)	177	181	176
Ta_I (L/W)	1,68	1,83	2
Leg I	1418	1626	1634
Cx_II	221	232	245
Tr_II	133	159	147
Bf_II	130	168	166
Tf_II	119	120	120
Ge_II	140	158	157
Ti_II	160	193	175
Ta_II	250	279	265
Leg II	1153	1309	1275
Cx_III	220	231	235
Tr_III	114	120	118
Bf_III	128	196	176
Tf_III	113	118	117
Ge_III	134	155	147
Ti_III	147	169	167
Ta_III	224	273	245

Leg III	1085	1257	1205
Cx_IV	217	296	275
Tr_IV	175	189	186
Bf_IV	171	200	205
Tf_IV	172	172	186
Ge_IV	196	214	205
Ti_IV	221	265	255
Ta_IV	276	320	295
Leg IV	1428	1656	1607
IP	5084	5848	5721



Figures 1-4. *Atractothrombium sylvaticum* Adult. (1) General view, in transparency, setae omitted; (2) chelicera; (3) palp tibia and tarsus, medial aspect; (4) palp tibia and tarsus, lateral aspect.

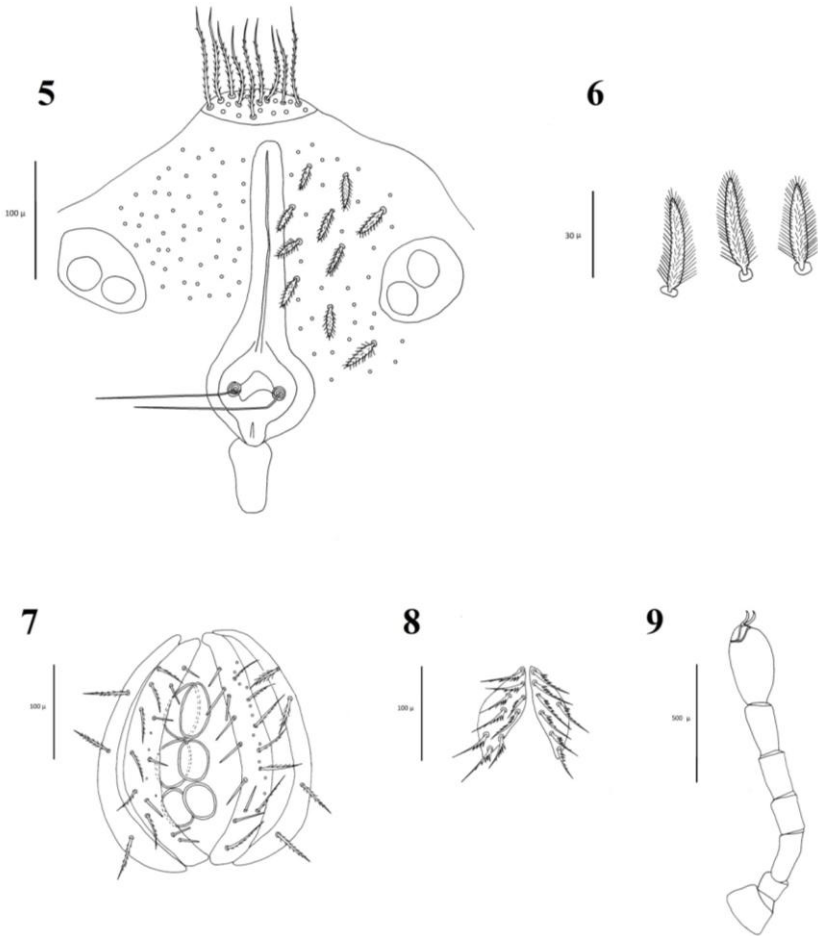
Table 2. Morphometric data on larva of *Atractothrombium sylvaticum*.

Character	Turkish specimens		European specimens	
	Min.	Max.	Min.	Max.
L	329.2	350	319.9	401.8
W	190.4	213	186.2	235.2
L/W	1.72	1.64	1.56	1.90
Scutum L	176.2	185.7	159	175
Scutum W	150	169	134	145
AA	59	76.3	54	69.3
AW	116	129,6	106	135
PW	127.6	148.1	119	154.4
SB	100.1	116.4	100	130.6
ASB	158.2	167.1	140	174.2
PSB	20.3	20.8	14	25.7
AP	45.4	50.6	40	57.5
AM	24.2	40	29.7	55
AL	30.6	35.5	28	41.5
PL	48.2	47.2	42	57.4
S	56.5	78	41.5	80
MA	85	93.4	80	102.9
HS	53.5	50.7	47.5	63.3
LSS	131.4	171.7	152.5	180
SL(=c1)	52	57.5	53.4	65.3
SS	75.3	86.8	68	95.4
Cx I	73.6	77.4	50	77.2
Tr I	39.8	37.5	35	47.5
Fe I	62.8	61.7	51.4	62.5
Ge I	26.3	25.8	20	30
Ti I	53.6	51.4	42	55
Ta I	88	91,7	62.5	91
Leg I	344.1	345.5	280	352.5
Cx II	70.4	80.8	46	75.2

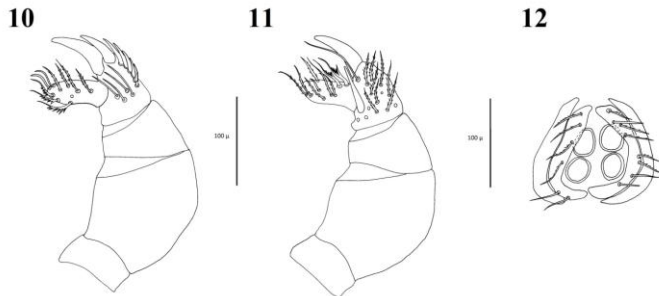
Tr II	36.8	41.3	32	45
Fe II	62.6	71.2	53.4	67.5
Ge II	21.5	22.6	17.8	26
Ti II	46.6	46.7	39.6	52.5
Ta II	81.2	87	72	87.5
Leg II	319.1	349.6	276	332.5
Cx III	57.7	73.3	46	69.3
Tr III	40.4	46.4	37.5	52.5
Fe III	66.1	73.8	58	73.2
Ge III	23.1	22.8	19.8	27.5
Ti III	52.3	58	48	62.5
Ta III	71	76.9	63.3	83.1
Leg III	310.6	351.2	281	347.5
IP	973.8	1046.3	873	1010

Table 3. Chaetotaxy of legs I-III (genu-tarsus) for larvae of *Atractothrombium sylvaticum*.

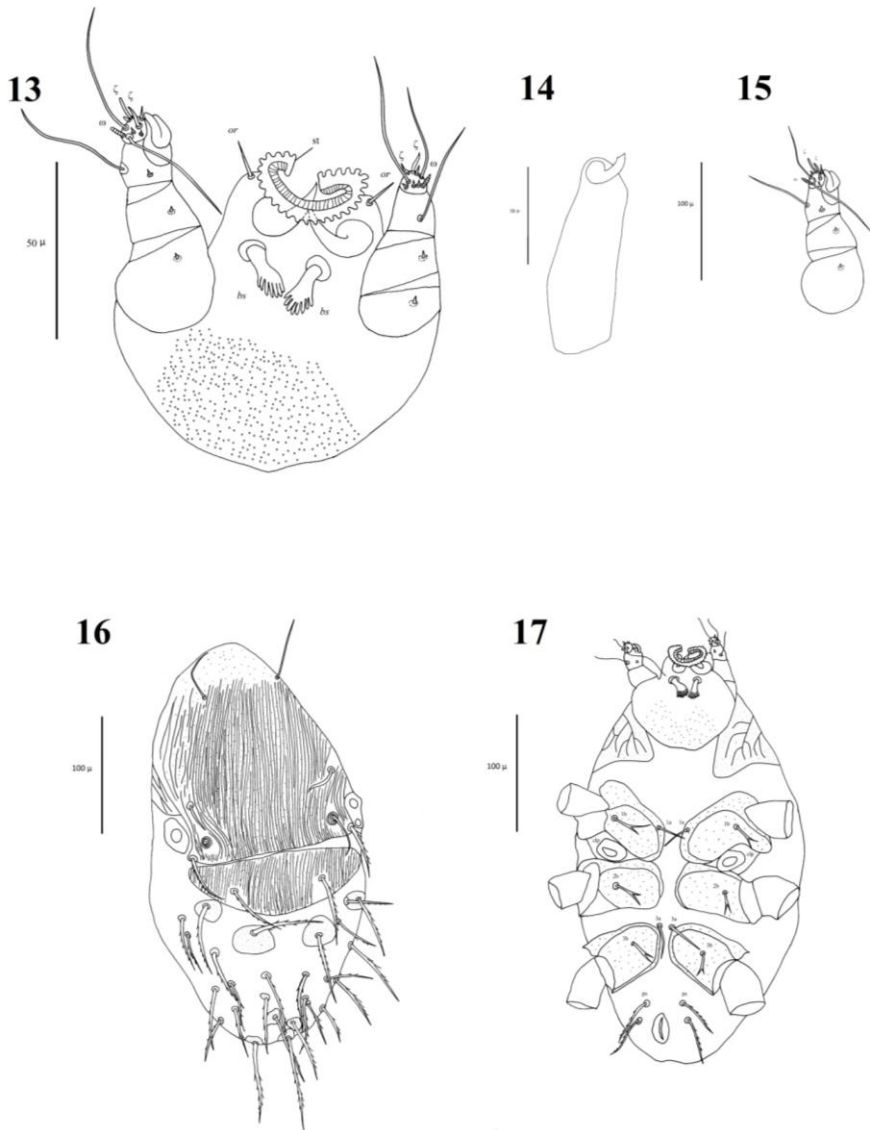
	Turkish specimens	European specimens
Ge I	4 B, 2σ, 1κ	4 B, 2 σ, 1κ
Ti I	6 B, 2φ, 1κ	6 B, 2 φ, 1 κ
Ta I	16(17) B, 2 ζ, 1 ω, 1 ε	17 B, 2 ζ, 1 ω, 1 ε
Ge II	2 B, 1 σ, 1 κ	2 B, 1 σ, 1 κ
Ti II	5 B, 2 φ	5 B, 2 φ
Ta II	13 B, 1 ω, 1 ζ, 1 ε	13 B, 1 ω, 1 ε, 1 ζ
Ge III	2 B, 1 σ	2 B, 1 σ
Ti III	5 B	5 (6) B
Ta III	10 B, lofhotrix, scopa	10 B, lofhotrix, scopa



Figures 5-9. *Atractothrombium sylvaticum* Adult. (5) crista metopica region; (6) dorsal opisthosomal setae (pdS); (7) genital opening; (8) anus; (9) leg I, setae omitted.



Figures 10-12. *Atractothrombium sylvaticum* Deutonymf. (10) palp tibia and tarsus, medial aspect; (11) palp tibia and tarsus, lateral aspect; (12) genital opening.



Figures 13-17. *Atractothrombium sylvaticum*, larva. (13) Gnathosoma, ventral view; or = protorostral seta, st = stephanostome, bs = tritorostral seta; (14) chelicerata; (15) palp dorso-lateral aspect; (16) dorsal sides of the body; (17) ventral dorsal side of the body; clp = Claparède's organ.

18



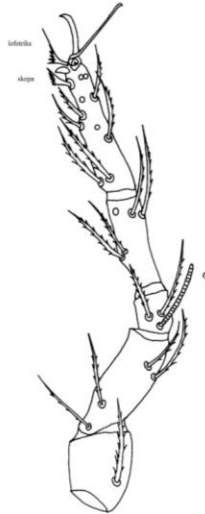
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100 μ

20

100 μ



Figures 18-20. *Atractothrombium sylvaticum*, larva. (18) leg I; (19) leg II; (20) leg III