

First records of the genus *Paratrombium* Bruyant, 1910 (Acari: Trombidiidae) from Turkey

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Abstract: The genus *Paratrombium* Bruyant (Acari: Trombidiidae) is recorded from Turkey for the first time based on collections of *P. insulare* (Berlese, 1910) and *P. megalochirum* (Berlese, 1910). Each species is illustrated, and briefly redescribed with accompanying drawings. Larvae of both species were obtained by experimental rearing. The updated distribution of species is provided.

Key words: Parasitengona, Paratrombiinae, new records, Turkey

Trombidiidae Leach, 1815 constitutes a taxon of worldwide distribution. This family includes 23 genera and 206 species in the world (Mağol and Wohltmann, 2012, 2013). The genus *Paratrombium* comprises at present 38 nominal species (Mağol and Wohltmann, 2012; Konikiewicz and Mağol, 2014; Noei et al., 2015). Of these, 8 species are known exclusively from larvae, 23 from postlarval stages, and only 7 from both larval and postlarval stages. Larvae of *Paratrombium* are known as parasites of Hymenoptera, Hemiptera, Coleoptera, and Diptera (Noei et al., 2015). Only 4 genera (*Trombidium*, *Allothrombium*, *Dolichothrombium*, and *Emitrombidium*) have been hitherto known from Turkey (Erman et al., 2007; Mağol and Sevsay, 2011; Mağol and Sevsay, 2014; Sevsay et al., 2016). In this paper, we report 2 species of *Paratrombium* from Turkey for the first time.

Mite specimens were taken from northeastern Turkey (Bayburt, Erzincan, Giresun, and Gümüşhane provinces) between 2013 and 2015. Adults were collected with an aspirator directly from soil, or by extraction in Berlese funnels. Larvae were reared from eggs deposited by adults collected in the field. All specimens are deposited in the Biology Department of Erzincan University, Erzincan, Turkey. The morphological terminology follows Mağol and Wohltmann (2000). All measurements are given in micrometers.

Family Trombidiidae Leach, 1885

Genus *Paratrombium* Bruyant, 1910

Type species *Paratrombium egyptium* Bruyant, 1910

Paratrombium insulare (Berlese, 1910)

Adults. Standard measurements in Table 1. Body length 1295–1710; width, 1014–1355. Crista metopica slightly widened, not clearly terminated in its anterior part, does not reach anterior margin of aspidosoma (Figure 1). Opisthosomal setae; uniform, slightly thickened stem, narrowing towards tip, stem densely covered with long and short setulae (Figure 2).

Deutonymphs. Standard measurements in Table 1. Setation sparser than in adults. Palptibia with at least 1 long eupathidium placed close to palptibial claw. Opisthosomal setae covered with relatively long and curved setulae. Two pairs of genital acetabula.

Larvae. Standard measurements in Table 2. Pedipalp formula 0–N–0–NNN–NNN $\omega\omega\zeta\zeta$ (Figure 3). Scutum widened anteriorly and great part of surface porous. Scutum covers more than half of dorsal side of body (in unengorged larvae); no distinct fold on both sides of symmetry axis. Anterior part of sclerite widened and longitudinally striated, covering almost half of scutum. Scutellum porous, with 1 pair of barbed setae (Figures 4 and 5). *fD* formula: 2-2-6-4-4-2-2.

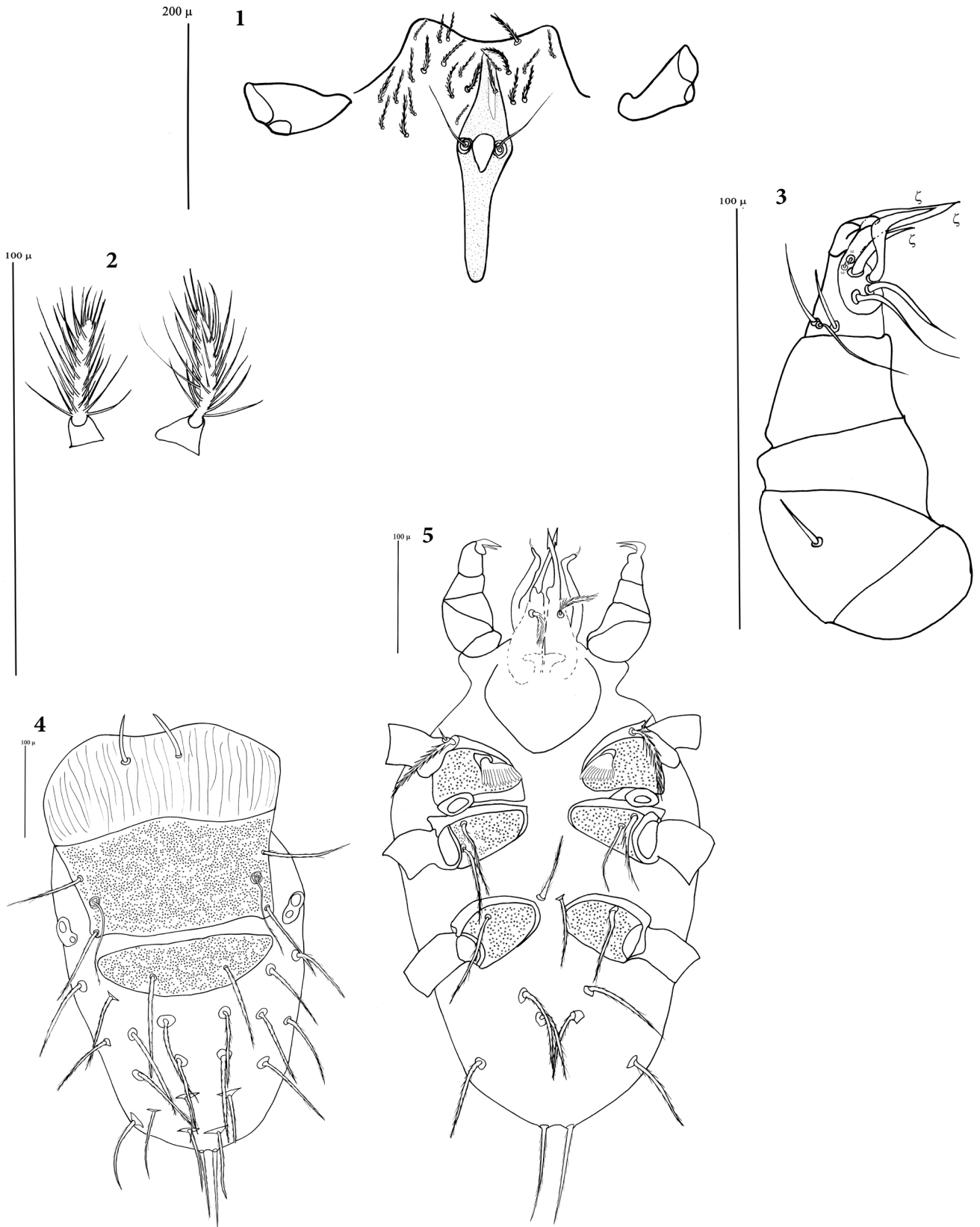
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Table 1. Morphometric data on adults and deutonymphs of *P. insulare* and *P. megalochirum*, with comparison to European specimens.

Characters	<i>P. insulare</i> female min-max (n = 2)	<i>P. insulare</i> European specimens (Mağkol, 2000) female min-max (n = 6)**	<i>P. insulare</i> deutonymph min-max (n = 9)	<i>P. insulare</i> European specimens (Mağkol, 2000) deutonymph min-max (n = 5)**	<i>P. megalochirum</i> female min-max (n = 2)	<i>P. megalochirum</i> European specimens (Mağkol, 2005) female min-max (n = 5)**
L	1158-1701	1694-2263	507-960	815-1201	1295-1701	1694-2618
W	890-1255	1247-1709	400-710	661-1001	1014-1255	924-1540
L/W	1.26-1.41	1.24-1.41	1.18-1.35	1.2-1.3	1.27-1.35	1.5-1.9
CML*	140-171	173-201	63-135	106-126	143-171	197-292
S	150-210	-	47-170	-	135-150	-
E	75-86	94-110	45-73	51-67	105-114	79-118
SB	30-31	31-39	17-27	19-27	32-47	35-39
Ch	35-40	39-51	21-41	27-35	42-43	39-55
Ti Cl	73-77	90-110	43-70	63-75	82-90	90-110
Pa Ta	87-116	122-158	41-80	71-79	120-131	94-142
pDS	23-37	25-31	20-36	23-31	20-34	23-35
GOP l	219-230	233-319	85-122	106-146	254-277	221-327
GOP w	135-138	181-217	55-88	94-110	163-203	177-193
GOP l/w	1.58-1.7	1.18-1.65	1.15-2.12	1.11-1.17	1.36-1.55	1.2-1.8
Ti I	175-238	227-264	95-116	114-118	135-185	184-246
Ta I I	342-491	418-529	140-233	213-237	376-445	316-470
Ta I w	171-194	183-220	70-118	102-110	160-194	150-215
Ta I I/w	2-2.53	2.28-2.65	1.81-2.33	1.96-2.15	2.29-2.35	2.0-2.4

* Without anterior process.

**The numbers after the decimal point were not taken.



Figures 1–5. *Paratrombium insulare* (Berlese). Adult: [1] Crista metopica; [2] Dorsal opisthosomal setae. Larva: [3] Palp tarsus; [4] Dorsal view; [5] Ventral view.

Table 2. Morphometric data on larvae of *P. insulare* and *P. megalochirum*, with comparison to European specimens.

Characters	<i>P. insulare</i> larvae min-max (n = 10)	<i>P. insulare</i> European specimens (Mağol, 2000) larvae min-max (n = 35)**	<i>P. megalochirum</i> larvae mean (n = 10)	<i>P. megalochirum</i> European specimens (Mağol, 2005) larvae mean (n = 20)
L	320-377	312-375	349	308
W	233-298	213-248	233	186
L/W	1.23-1.52	1.36-1.61	1.49	-
AA	48-55	49-59	51	44
AW	189-205	184-207	191	170
PW	184-201	178-199	182	167
SB	166-188	154-180	165	145
ASB	154-177	148-170	153	143
PSB	38-51	39-49	40	39
ASB+PSB	198-215	-	193	182
AP	43-60	37-49	38	35
AM	47-60	51-61	44	48
AL	54-66	55-77	66	59
PL	69-79	55-87	73	66
S	66-85	73-91	71	73
MA	128-140	124-142	126	123
HS	60-68	59-71	57	61
LSS	181-204	188-209	199	225
SL	80-88	77-91	79	75
SS	75-87	73-89	75	68
DS*	59-83	63-93	69	67
h_1	89-99	95-106	91	-
Ch	49-57	49-57	48	-
Cx_I	67-78	65-79	70	82
Tr_I	45-59	39-49	49	43
Fe_I	50-66	59-69	60	77
Ge_I	31-42	29-37	34	40
Ti_I	53-63	49-63	51	63
Ta_I	77-86	79-89	81	97
LEG I	352-378	330-372	345	326
Cx_II	70-83	69-81	74	96
Tr_II	42-52	35-49	47	43
Fe_II	40-60	43-61	52	60
Ge_II	31-36	27-35	28	33
Ti_II	48-54	45-57	46	57
Ta_II	73-85	71-81	72	87
LEG II	322-348	316-346	319	294
Cx_III	64-74	59-73	68	89
Tr_III	47-60	39-51	53	60
Fe_III	51-63	55-69	59	73
Ge_III	27-36	27-35	31	37
Ti_III	47-62	49-63	52	67
Ta_III	78-93	71-85	79	97
LEG III	337-363	328-368	342	316
IP	1017-1083	991-1077	1007	936
*Except h_1 .				

**The numbers after the decimal point were not taken.

Specimens examined: 05 April 2014, 3 deutonymphs, Bayburt, Aydıntepe Plateau, 40°27'20"N, 40°06'50"E, elevation 2455 m a.s.l., litter from under *Astragalus* sp.; 01 May 2015, 2 deutonymphs, Bayburt, Demirözü vicinity, 40°09'10"N, 39°52'04"E, elevation 1676 m a.s.l., mossy soil (Leg. İ. Karakurt); 22 May 2013, 4 adults (rearing was only successful for 1 specimen; 28 larvae were obtained by experimental rearing), Erzincan, Ahmediye pond, 39°52'53"N, 39°20'31"E, elevation 1978 m a.s.l., mossy soil, close to the pond (Leg. S. Sevsay, S. Adil); 12 October 2013, 2 adults, Giresun, Kovancık village, 40°52'32"N, 38°51'30"E, elevation 94 m a.s.l., litter from under tea plants; 17 May 2014, 1 adult, Gümüşhane, Örumcek Forest, 40°41'07"N, 39°03'08"E, elevation 780 m a.s.l., litter under rock and soil; 16 July 2014, 1 deutonymph, Gümüşhane, Kadırğa plateau, 40°42'28"N, 39°11'59"E, elevation 1245 m a.s.l., litter from under *Abiyes* sp.; 25 September 2014, 1 deutonymph, Giresun, Arzumlar burgh, 40°24'53"N, 39°40'13"E, elevation 1344 m a.s.l., mossy soil; 10 September 2014, 2 adults, Gümüşhane, Araköy plateau, 40°38'41"N, 39°08'52"E, elevation 714 m a.s.l., litter from under hazelnut tree; 16 April 2015, 2 adults, 2 deutonymphs, Gümüşhane, Kazıkbeli plateau, 39°48'25"N, 39°22'49"E, elevation 482 m a.s.l., litter from under hazelnut tree; 14 May 2015, 1 adult, Gümüşhane, Vauk passage, 40°23'02"N, 39°46'43"E, elevation 1563 m a.s.l., litter from *Salix* sp.; 18 May 2015, 2 adults, 2 deutonymphs, Gümüşhane, Örumcek Forest, 40°41'07"N, 39°03'28"E, elevation 1110 m a.s.l., litter from under *Abiyes* sp. (Leg. S. Adil).

Distribution. Algeria, Finland, Greece, Italy, Norway (Mağol and Wohltmann, 2012). New record for the Turkish fauna.

Remarks. The larval setal and morphological characters of Turkish specimens are a perfect match to the European specimens described by Mağol (2000). The adult character states are also similar, and differed only slightly in measurements that do not seem significant due to great variation in postlarval stages.

Paratrombium megalochirum (Berlese, 1910)

Adults. Standard measurements in Table 1. Body length is 1295–1710 and width 1014–1355. Posterior process of crista metopica distinctly widened, with no clearly marked termination (Figure 6). Opisthosomal setae uniform, with thickened stem, covered with numerous long setulae;

setulae the longest at proximal part of stem. Distal setulae shorter, passing beyond stem termination (Figure 7).

Larvae. Standard measurements in Table 2. Pedipalp formula 0–N–0–NNN–NN $\omega\omega\zeta\zeta$ (Figure 8). Scutum covers more than half of dorsal side of body (in unengorged larvae); distinct fold present on both sides of symmetry axis, in posterolateral part of scutum. Anterior part of sclerite widened and longitudinally striated along border of AM setae. Scutellum almost as broad as scutum, porous (Figures 9 and 10). fD formula: 2(2)2–6–4–4–2.

Specimens examined: 08 May 2014, 1 adult (50 larvae obtained under laboratory conditions), Erzincan, Ahmediye pond, 39°52'56"N, 39°20'31"E, elevation 2043 m a.s.l., mossy soil; 07 June 2014, 3 adults (rearing was only successful for 1 female; 21 larvae obtained under laboratory conditions), Erzincan, Ahmediye pond, 39°52'56"N 39°20'27"E, elevation 2033 m a.s.l., mossy soil (Leg. E. Buğa).

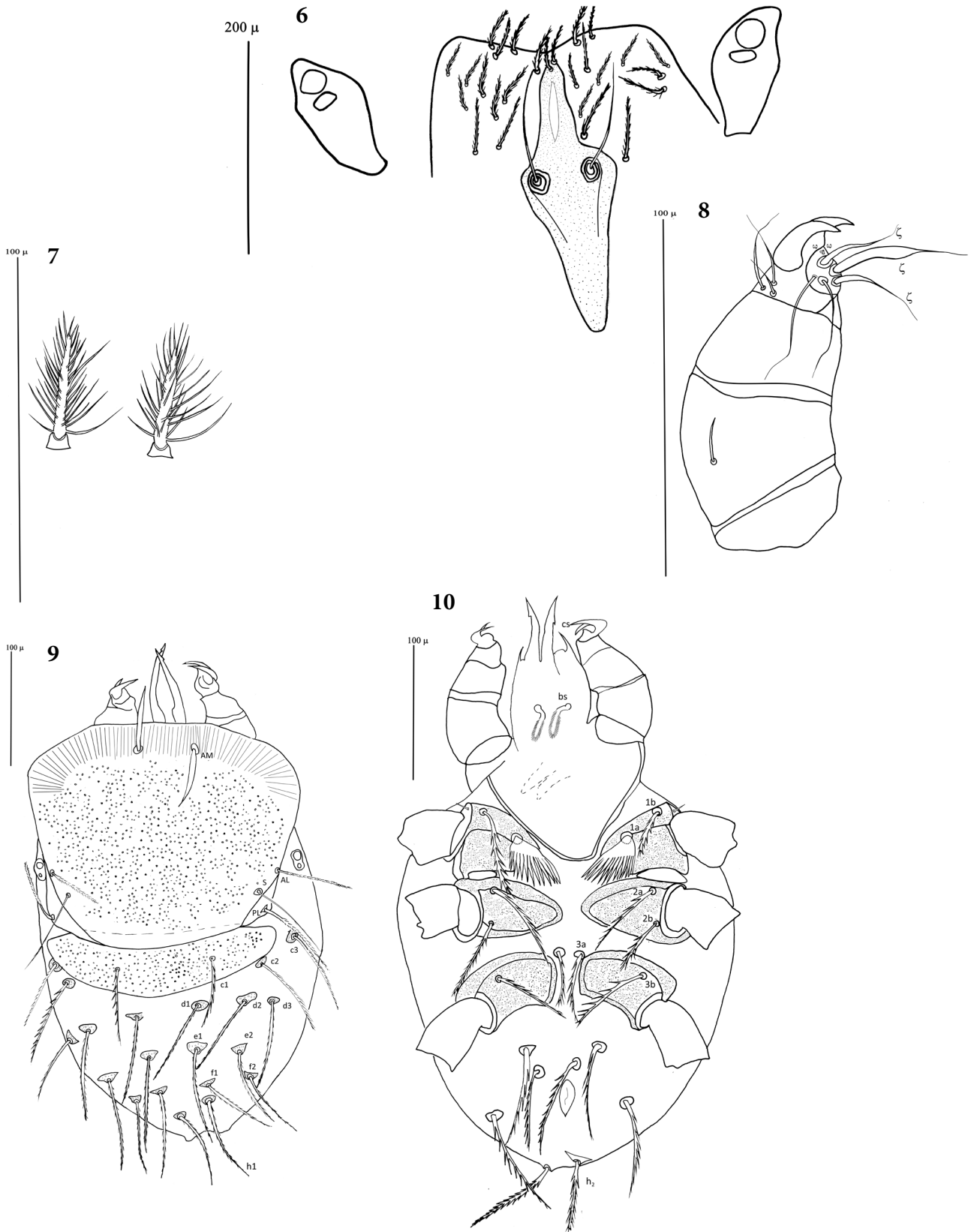
Distribution. Austria, Bulgaria, France, Iran, Italy, Norway, Poland, Romania, San Marino, Spain, Switzerland, the Netherlands (Mağol and Wohltmann, 2012; Noei et al., 2015). New record for the Turkish fauna.

Remarks. Larvae of Turkish specimens are similar to the European specimens described by Robaux (1969) and repeated in Mağol (2005). Only mean values are available for most measurements given by Robaux (1969). They are similar to our measurements, except that 1 normal seta on the palp tarsus is absent in larvae of the Turkish specimens.

Additionally, adults of Turkish specimens are similar to the European specimens given by Mağol (2005). Some different measurements (body length and width, etc.) for the adults are considered insignificant, since great variation is common in postlarval stages. Adult morphometrics are considered unimportant; the size of idiosoma is not a good character to compare, as it changes due to the physiological state.

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Figures 6–10. *Paratrombium megalochirum* (Berlese). Adult: [6] Crista metopica; [7] Dorsal opisthosomal setae. Larva: [8] Palp tarsus; [9] Dorsal view; [10] Ventral view.

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