A NEW RECORD OF THE GENUS *EUTROMBIDIUM* VERDUN (ACARI: MICROTROMBIDIIDAE) FOR THE TURKISH FAUNA

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ABSTRACT: Larvae of *Eutrombidium djordjevici* Saboori & Pešić, 2006 are first time recorded for Turkey. This species collected from an unidentified grasshoppers (Orthoptera: Acrididae), morphological features and zoogeographical distributions are given here.

KEY WORDS: Acrididae, Ectoparasite, *Eutrombidium*, Microtrombidiidae, Turkey

So far, three species relating to *Eutrombidium* have been recorded from Turkey. The three species are as follows; *Eutrombidium locustarum* (Walsh, 1866), *Eutrombidium robauxi* Southcott, 1993 and *Eutrombidium trigonum* (Hermann, 1804) (Southcott, 1993; Adil & Sevsay, 2013; Sevsay & Karakurt, 2013). This is the fourth species of *Eutrombidium* from Turkey.

In this paper larvae of *Eutrombidium djordjevici* is recorded and illustrated as an ectoparasite on undetermined, grasshoppers (Orthoptera: Acrididae) from Bayburt province, Turkey.

MATERIAL AND METHODS

Mites were extracted from an unidentified grasshopper (Orthoptera: Acrididae) from Bayburt, Turkey. Examined material was preserved in 70% ethyl alcohol and cleared in 9% KOH. Specimens for light microscope studies (8 larvae) were fixed on slides in Hoyer's medium (Krantz & Walter, 2009). Measurements were taken and drawings made under a Leica DM 4000 phase contrast microscope. Robaux (1974) and Southcott (1993) followed for the morphological terminology in the text. All measurements are given in micrometers (µm).

RESULTS AND DISCUSSION

Family Microtrombidiidae Thor, 1935
Genus *Eutrombidium* Verdun, 1909

Type species: *Trombidium trigonum* Hermann,1804

Eutrombidium djordjevici Saboori et Pešić, 2006

Diagnosis. Larva. Colour in life red. Gnathosoma with horseshoe-like sclerite bearing large denticled membranes outside. Palp femur and genu bearing one spine-like seta each and palp tibia with three setae. Hypostomal setae (*bs*) conical and stout. The surface of scutum punctuate with three pairs nonsensillary setae and one pair sensillary setae. *AM* setae smooth, *AL* and *PL* setae very slightly setulose. *PL* setae relatively short. L/W range of scutum < 1. The h_{1-2} setae are almost equal in length and with plates. *1a* setae thin, long and weakly barbed. Setae of lateral coxala (*1b*, *2b* and *3b*) bifid. Tarsus I and tarsus II terminated with two claws with end of portions trifurcate and a slender normal empodium; Tarsus

III terminated outer claw with end of portion trifurcate, inner claw modified (smilum) and a slender claw-like empodium.

Descriptions. Standard measurements in Table 1. Body length 1090-2071, width 700-1207.
Gnathosoma. With ring-like sclerite around mauth opening. Internal edge of cheliceral blades a small tooth. Adoral setae (*or*) smooth. Hypostomal setae (*bs*) conical and stout. Palp femur and genu bear short spine-like seta each. Palp tibia with a long nude seta, a short nude seta and relatively thin, conical seta close to paradont. Palp tibial claws bifid. Palp tarsus with one solenidion, two eupathidia, one long, barbed, one long nude and two short nude setae. *f*Pp formula:0-N-N-NNN-BNNNωζζ (Fig. 1).
Idiosoma dorsum. Scutum square, convex at anterior border and surface of it punctuate with three pairs of nonsensillary setae and one pair sensillary setae. *AM* setae smooth, *AL* setae rather short and *PL* setae barbed. Sensilla filiform. A pair of eyes that include double lenses and surface of eye plates, between eye lenses, punctuate. Anterior lens larger than posterior one . Scutellum almost as broad as of scutum, slightly convex at anterior border and punctuations similar to that on scutum, bears one pair of barbed c_1 setae. All dorsal setae situated on plates or platelets (the largest d_1 and c_2 plates) slightly barbed and arranged in five rows. Length of dorsal setae 22-56 in range. The h_{1-2} setae with plates and both setae longer than dorsal setae. *f*D formula: 6-6-6-4-4 (c_1-c_3, d_1-$_3$, e_1-$_3$, f_1-$_2$, h_1-$_2$) (Figs. 2, 3).
Idiosoma venter. Claparéde's organs laterally between coxae I and coxae II. *f*Cx formula: BB-B-B. *1a* setae long and barbed. *1b, 2b* and *3b* setae bifid. One pair of barbed intercoxal setae *3a* placed in above coxal plates III. Posteriorly following five pairs barbed setae situated on plates anterior and lateral to anal opening. *f*V formula: 2-2-2u-2. Ventral setae slightly thinner than dorsal setae. Anal opening without sclerite (Fig. 4).
Legs. (Figs. 13-18). Legs segmentation formula: 6-6-6. All of them punctuate. Legs setal formula: [I] Tr (1B) – Fe (6B) – Ge (4B, 2σ, 1κ) – Ti (6B, 2φ) – Ta (16-17B, 2ζ, 1ω, 1ε) ; [II] Tr (1B) – Fe (5B) – Ge (2B, 1σ, 1κ) – Ti (5B, 2φ) – Ta (12-13 B, 1ω, 1ε,2 ζ); [III] Tr (1B) – Fe (4B) – Ge (2B, 1σ) – Ti (5B) – Ta (12-13B, scopa and lophotrix). Tarsus I and tarsus II terminated with two trifurcate claws and a slender empodium; Ta III with outer trifurcate claw inner claw modified (smilum) and a slender claw-like empodium (Figs. 5-7).
Material examined. 14 September 2013, 5 larvae were caught as an ectoparasite on undetermined grasshopper (Orthoptera: Acrididae), Yakup Abdal forest 40°03′13″N 39°43′16″E 1892 m a.s.l. and 05 April 2014, 3 larvae were caught on unidentified grasshopper, Aydıntepe Plateau 40°24′58″N 40°07′27″E 2014 m a.s.l. (leg. İ. Karakurt and H.H. Özbek) Bayburt, Turkey. The specimens were deposited in Biology Laboratory of Erzincan University, Erzincan, Turkey.
Distribution. Iran, Montenegro (Saboori & Pešič, 2006; Saboori & Hakimitabar, 2013) and Turkey.

DISCUSSION

Larvae of *E. djordjevici* were described firstly from Montenegro by Saboori & Pešič (2006). Our study shows that there are some differences between Turkish and Montenegro specimens. Saboori & Pešič (2006) expressed palpal femur and genu without setae and length of *PL* 15-25 in range. But palpal femur and genu of Turkish specimens bear a short seta and *PL* 23-32 in range (see Table 1).

On the other hand, morphologically larvae of *E. djordjevici* are very similar to larvae of *E. trigonum*. *E. djordjevici* differs from *E. trigonum* by the short *LN* (21-29, 21-23 in Turkish specimens, vs. 29-40), vestigiala (κ) seta on tibia I(absent vs. present).

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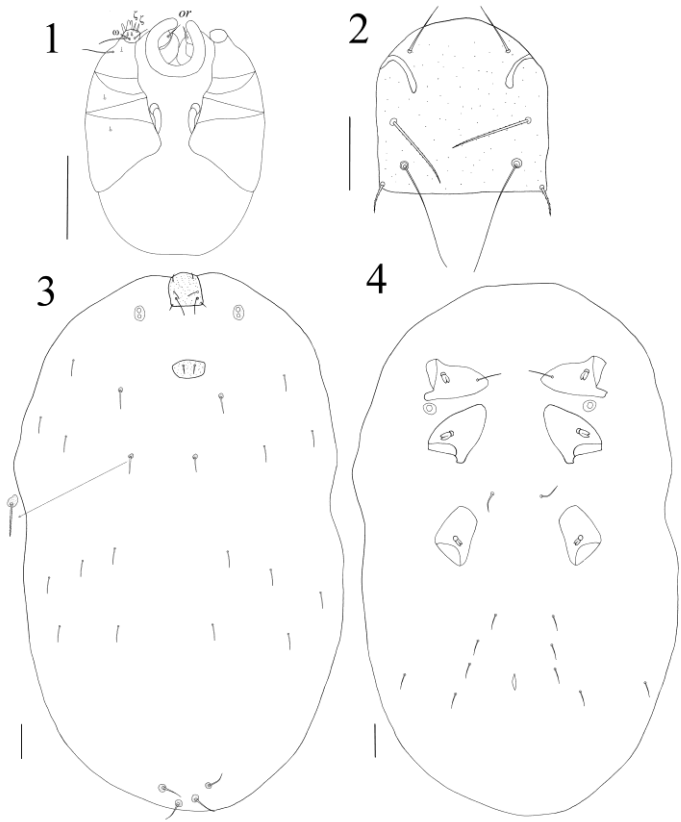
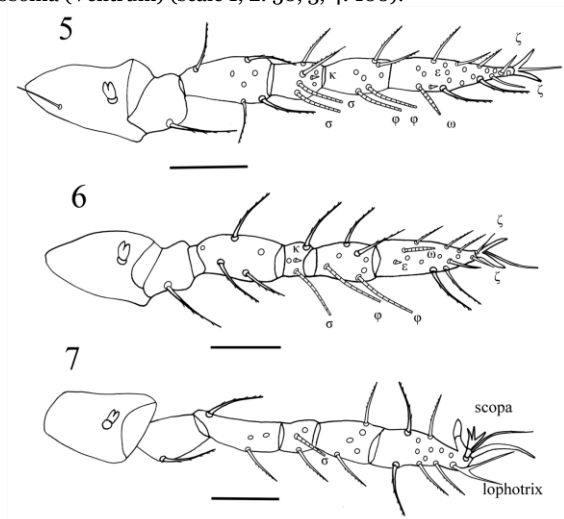
Table 1. Morphometric data on larvae of *E. djordjevici*.

	E. djordjevici (n=8)		*E. djordjevici* Saboori &Pešić, 2006
Character	**Mean**	**Min.-max.**	**Min.-max.**
IL	1670	1090-2071	225-2003
IW	1150	700-1207	151-940
LN	23	21-25	21-29
MA	55	52-57	52-62
AW	107	103-112	99-107
PW	120	115-126	101-121
SB	85	82-92	72-89
MSA	52	50-55	52-61
ASB	100	90-112	99-121
PSB	21	20-22	17-25
L	121	118-126	119-141
W	125	123-128	116-136
AP	43	42-45	35-47
SA	21	17-30	25-37
SP	18	16-24	20-25
AM	54	47-57	35-50
AL	52	47-55	33-47
PL	27	23-32	15-25
AMB	73	69-78	62-79
S	83	77-85	77-82
PLN	17	12-20	15-32
HS	73	69-80	62-74
LSS	129	123-142	106-134

SS	51	43-59	32-79
SL	37	30-40	27-33
DS	34	22-56	19-50
MDS	42	30-50	27-52
LPS	84	80-87	87-99
MPS	83	80-85	82-92
AW/SS	2.45	2.15-2.86	2.06-3.09
HS/PLN	4.51	4.16-5.63	1.94-4.23
CX_I	69	65-75	57-62
TR_I	35	33-38	30-32
FE_I	39	35-52	45-59
GE_I	23	21-30	25-35
TI_I	44	40-49	39-42
TA_I (L)	76	70-80	72-92
TA_I (H)	17	16-18	17-20
LEG I	289	278-310	278-307
CX_II	66	58-75	54-67
TR_II	31	28-35	29-37
FE_II	48	45-55	47-59
GE_II	21	18-24	20-24
TI_II	36	33-40	30-42
TA_II (L)	67	65-70	67-82
TA_II (H)	17	15-20	19-21
LEG II	271	260-290	254-307
CX_III	57	55-65	52-62
TR_III	33	30-38	37-42
FE_III	51	45-58	52-62
GE_III	20	18-23	20-22
TI_III	41	39-48	33-52
TA_III (L)	54	52-58	49-62
TA_III (H)	17	16-18	20-20
LEG III	260	250-275	242-288
IP	843	815-865	784-902
SA/SP	1.35	1.2-1.5	1.0-1.76
AW/AMB	1.55	1.4-1.6	1.31-1.59
SL/SS	0.75	0.61-0.82	0.57-0.86
LSS/SS	2.65	2.15-3.25	2.53-3.6



Figures 1-4. *Eutrombidium djordjevici* (larva) 1. Gnathosoma 2. Scutum 3. Idiosoma (dorsum) 4. Idiosoma (Ventrum) (scale 1, 2: 50, 3, 4: 100).



Figures 5-7 *Eutrombidium djordjevici* (larva) 5. Leg I 6. Leg II 7. Leg III (scale 5-7: 50).